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The Use of Blogs for Teaching and Learning in UK and US Higher Education

By

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A thesis submitted to Plymouth University in partial fulfilment for the degree of

DOCTOR OF PHILOSOPHY

Graduate School of Management

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Author’s Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee. Work submitted for this research degree at the Plymouth University has not formed part of any other degree either at Plymouth University or at another establishment. Relevant scientific seminars and conferences were regularly attended at which work was often presented and several papers prepared for publication.

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Abstract

Within the last decade there has been a significant increase in the range of Social Media tools that have become available. This has led to a significant increase in the use and popularity of Social Media within many aspects of everyday life, particularly within the UK and US.

One of the areas in which there has been a rise in the use of Social Media is within Higher Education (HE). Within HE there have been reports that Social Media has been successfully utilized for teaching and learning, particularly in the case of blogs. Despite reportedly successful usage there has to date been relatively few empirical studies which have explored whether the use of blogs within teaching and learning leads to an increase in perceived learning by students. This research study therefore provides an empirical study of perceived learning by students when using blogs within teaching and learning in UK and US HE.

This research study adopts a post positivist research approach and a quantitative research design method. Questionnaires have been utilised in order to explore student views of perceived learning when using blogs as a tool for HE teaching and learning within the UK and US. This study provides a framework for student use of blogs within HE teaching and learning and explores whether the use of blogs in this way leads to greater levels of perceived learning amongst students.

The results of this research are analysed using PLS-SEM and have shown that the successful use of blogs for teaching and learning is complex. The results have demonstrated that students do report higher degrees of learning from using blogs within teaching and learning, however, this is influenced by the perceptions students hold relating to digital technology, teaching and learning, previous experience and expectations of blogging.

The results of this study have implications for both HE teachers and HE students. It also provides a framework which can be used to help ensure the successful use of blogs when utilised for HE teaching and learning within the UK and US in the future.
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# List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Term</th>
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<tbody>
<tr>
<td>AARS</td>
<td>Average adjusted R-squared</td>
</tr>
<tr>
<td>AFVIF</td>
<td>Average full collinearity VIF</td>
</tr>
<tr>
<td>APC</td>
<td>Average path coefficient</td>
</tr>
<tr>
<td>ARS</td>
<td>Average R-squared</td>
</tr>
<tr>
<td>AVE</td>
<td>Average Variance Extracted</td>
</tr>
<tr>
<td>AVIF</td>
<td>Average Variance Inflation Factor</td>
</tr>
<tr>
<td>BBC</td>
<td>British Broadcasting Company</td>
</tr>
<tr>
<td>CB-SEM</td>
<td>Co-variance Based Structural Equation Modelling</td>
</tr>
<tr>
<td>CoP</td>
<td>Community of Practice</td>
</tr>
<tr>
<td>EXB</td>
<td>Expectations of Blogging</td>
</tr>
<tr>
<td>ISCED</td>
<td>International Standard Classification of Education</td>
</tr>
<tr>
<td>H</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>HE</td>
<td>Higher Education</td>
</tr>
<tr>
<td>N/A</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>PBE</td>
<td>Previous Blogging Experience</td>
</tr>
<tr>
<td>PLS-SEM</td>
<td>Partial Least Square – Structural Equation Modelling</td>
</tr>
<tr>
<td>PDT</td>
<td>Perceptions of Digital Technology</td>
</tr>
<tr>
<td>PL</td>
<td>Perceived Learning</td>
</tr>
<tr>
<td>PTL</td>
<td>Perceptions of Teaching and Learning</td>
</tr>
<tr>
<td>RYB</td>
<td>Rhythm of Blogging</td>
</tr>
<tr>
<td>RYB_CMI</td>
<td>Rhythm of Blogging – Commenting In</td>
</tr>
<tr>
<td>RYB_CMO</td>
<td>Rhythm of Blogging – Commenting Out</td>
</tr>
<tr>
<td>RYB_REA</td>
<td>Rhythm of Blogging – Reading</td>
</tr>
<tr>
<td>RYB_WRT</td>
<td>Rhythm of Blogging – Writing</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Modelling</td>
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<tr>
<td>VIF</td>
<td>Variance Inflation Factor</td>
</tr>
<tr>
<td>VLE</td>
<td>Virtual Learning Environment</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>US</td>
<td>United States of America</td>
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1. Introduction

This Chapter will provide a brief initial background for the study. Following this the research gaps and contribution to the area this research will make will be discussed. Subsequently the research aims, objectives and questions for this research will be presented. Finally, the importance of the study and the structure of this thesis will be outlined.

1.1 Research Background

Within the last decade, the use of the Internet and Social Media has become an increasingly important part of the everyday lives of students within the United Kingdom (UK) and United States of America (US) (Rosen, 2010, 2011; Rosen et al, 2013). This has led to an increasing number of commentators defining the generation of students entering Higher Education (HE) today as digital immersed and using web based technologies more extensively as part of their everyday lives (Prensky, 2001b, 2001a, 2010, 2012; Gallardo-Echenique et al, 2015; Tapscott, 2009; Rosen, 2010, 2011; Rosen et al, 2013, Gibbons, 2007; Oblinger & Oblinger, 2005, Fisher & Newton, 2014).

The manner in which the use of Social Media has exploded within recent years has not gone unnoticed within the HE sectors particularly within the UK and US where increasingly the use of Web 2.0 technologies is being promoted as a way in which to engage students more fully with learning (Crook, 2012). The use of such technologies within teaching and learning within UK and US institutions has not been fully embraced by all HE teachers and students (Rienties, Brouwer & Lygo-Baker, 2013; Patrut & Patrut, 2013; Akcayir et al, 2016).

The reasons for the lack of usage of these tools where this does occur within teaching and learning in the HE education sector is often attributed to lack of motivation on the part of staff or students (Gibbons, 2007; Margaryan & Littlejohn, 2008), a lack of understanding of the manner in which these tools can be used (Barnes, Marateo & Ferris, 2007) or an incompatibility within the way in which individuals learn (Tapscott, 2009). However, these do not appear to be substantiated
reasons for the failure of adoption, although in both cases for and against use evidence appears to be largely anecdotal (Bennett, Maton & Kervin, 2008; Jones, 2010; Waycott et al, 2010; Lai & Hong, 2015; Neira-Pineiro, 2015).

From the range of Web 2.0 and Social Media tools available it would appear that blogs are perhaps one of the most flexible and useful tools for teaching and learning use (Guadagno, Okdie & Eno, 2008).

Blogs are defined by Oxford Dictionaries (2017) as ‘a regularly updated website or web page, typically one run by an individual or small group, which is written in an informal or conversational style.’ A blog therefore is able to be used both as an individual tool and as a collaborative tool and is also a flexible tool which can be used in a range of ways (Singer, 2009). Another benefit of the use of blogs is the manner in which they can be open to the public or kept private amongst a small group or a single individual. Blogs can also be used to incorporate a range of different forms of media such as text, audio visuals and links. A further benefit of the use of blogs is the manner in which a blog creates a collection of digital content which is created, composed and published by its author(s) (Stone, 2004).

The use of blogs for teaching and learning has been chosen in this case for a number of reasons. Firstly, it is argued that blogs, more so than other Social Media tools, can enhance interactions amongst students and teachers, improve engagement with learning, increase feelings of community and increase perceived learning (Lee & Bonk, 2016). Blogs are also considered to create interesting dynamics which are not present in other types of Social Media (Gumbrecht, 2004). Blogs have therefore become one of the most popular ways in which Social Media has been adopted within HE teaching and learning. Due to their popularity compared to other Social Media tools (Moran, Seaman & Tinti-Kane, 2011) blogs are therefore considered a useful tool to explore within this study.

Blogs have also been chosen for this study due to the manner in which they allow use by individuals and groups, they allow collaboration and cooperation (Ozkan, 2015) or independent activities, they provide flexibility in their use in terms of structure, style, layout, platform and location and they allow the use of multiple other
media types. Blogs can therefore be considered to be both flexible and versatile (Goh, 2015).

In addition to this, blogs also have the characteristics that are shared by Web 2.0 and Social Media tools of being any time, any place, allowing interactivity, the ease of use, the strengthening of weak ties and are free to use (Efimova & De Moor, 2005; Stone, 2004).

When compared with other forms of Social Media blogs are also the tool which HE teachers report to consider to have most value when compared to other tools. It is for example reported that 52% of HE teachers consider blogs to have value for teaching and learning whilst 44% consider wikis to have value, 27% consider Facebook to have value and 17% consider Twitter to have value (Moran, Seaman & Tinti-Kane, 2011). Blogs are one of the tools that appear to have been most popular amongst teachers and students within HE (Moran, Seaman & Tinti-Kane, 2011). This therefore suggests that blogs are an important form of Social Media to be considered within this research context.

Within this study any form of blog that meet the definition above and is being used as part of a formal part of the teaching and learning of an HE programme shall be included within the study. This therefore can include collaborative as well as individual blogs and group blogs and blogs which use a range of media such as text, images, visuals, links and audio. Blogs therefore are considered to include social structures which are built around the blogosphere and are not present in other forms of Social Media (Efimova & Hendrick, 2005). The flexible nature of blogs therefore allows a range of different forms of teaching and learning to be examined within this study including individual, group and collaborative learning.

For the reasons outlined above blogs are demonstrated to be an important and flexible tool which is currently be used within teaching and learning within HE and which will be explored further within this study.

Alongside the rise in of Web 2.0 technologies, Social Media and blogs there has also been a development in relation to teaching and learning within HE (De Villiers,
In the last few years teaching and learning has seen a move away from more traditional behaviourist models of teaching and learning and a greater understanding of teaching and learning as a constructivist activity (Yang et al, 2016; Siemens, 2004). This development is interesting in terms of Social Media and blogs, as the tools offered by Social Media and particularly blogs provide good opportunities for students to learn applying constructivist principles (Noel, 2015).

Within this study, the HE teaching and learning of the UK and US are going to be considered. The UK and US have been selected due to the manner in which these countries are considered to be leading the way in creation of information societies and are seen to be leading in the use of educational technology and even using such technologies as a way of reconstructing society in the information age (Manichander, 2016). It is therefore the UK and US which are expected to be the countries in which the greatest degree of educational technology usage will have been promoted within education.

The US and UK have also been selected as they are reported to be the countries which are leading educational technology policies around the world. The UK and US are also considered to be seeking to actively deal with the digital divide that was seen to be arising within society (Manichander, 2016). It is even reported that the UK and US have resolved the digital divide through education (Harrison, 2015). It is therefore expected that students within the UK and US will be most likely to have made use of technology and social media within education and therefore will be best placed to provide responses to this research.

This study will also focus on the use of educational technology within teaching and learning in the UK and US as these countries are also reported to have been driving the use of educational technology over the last 30 years. As a result, these are the countries which have become leaders in educational technology marketplaces around the world (Selwyn, 2012).

Within this context, the UK and US should therefore represent countries in which the highest degree of use of educational technology within teaching and learning will be seen and in which individuals will be expected to be highly digital literate and
therefore have experience of using a range of different technologies within both their everyday lives and education.

Finally, the UK and US have also been selected due to the high level of research productivity which has been reported within the UK and US. According to analysis by Hsu, Hung & Ching (2013) the UK and the US are the countries which are mostly highly engaged in research relating to educational technology. Hsu, Hung & Ching (2013) also note that research within educational technology journals is most likely to be from the UK and US.

It is important to note when using the UK and US within this research that there are both similarities and differences in the systems of education used and the culture and nature of the countries. Similarities between the UK and US include, according to International Student (2017), a shared high quality of education, excellent research facilities, a culture that promotes intellectualism, academic freedom and excellent environments (both on campus and online). Both countries also have a shared language and are considered to be leaders in the use of technology and Social Media within the classroom (Scopus, 2016).

There are however important differences between the two countries which might result in differences in the results seen. For example, there are differences between the HE systems of the UK and the US include length of study, the organisation of Universities, style of study, cost and nature of programmes. Differences in results between the UK and US will however be explored further within this study in order to determine if the results from these countries are affected by the country in which students are studying.

1.2 Research Gap and Contribution

As the rise of constructivist teaching and learning and blogs have been developed there have been an increasing number of studies that have explored the success of Social Media for teaching and learning (Noel, 2015). To date studies have largely focused on qualitative methods or anecdotal evidence (Bennett, Maton & Kervin, 2008; Jones, 2010; Waycott et al, 2010; Lai & Hong, 2015; Neira-Pineiro, 2015). There have therefore been relatively few studies which have empirically explored the
use of blogs within HE teaching and learning (Lee & Bonk, 2016). This research study will seek to address five limitations that currently exist within this area of research. Each of these areas will now be summarized below.

Firstly, this study will seek to explore the digital perceptions of HE students and the degree to which their use of digital technologies affects their use of blogs for learning. Within the existing literature there appears to be fairly limited discussion concerning the degree to which student use of blogs is influenced by their digital perceptions. Students are increasingly being defined by terms such as the Net Generation (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott, 2009; Fisher & Newton, 2014) and IGeneration, (Rosen, 2010, 2011, Rosen et al, 2013) however the degree to which this applies to their comfort in using Web 2.0 technologies for teaching and learning has not been extensively discussed or tested.

Secondly this research will seek to explore the teaching and learning perceptions of HE students. It will also seek to determine whether viewing learning as a constructivist activity will lead to a greater comfort and use of blogs for learning. To date, existing literature relating to the pedagogical views of students appears to mainly focus on the views of students within traditional face-to-face teaching and learning. This study will therefore seek to determine whether constructivist views can equally be applied to the use of blogs within education.

Thirdly this research study will seek to explore in empirical terms how the socio-technical structure of blogs (Efimova & De Moor, 2005) and specifically the rhythm of blogging (how often an individual reads, writes and comments within a blogging context) may influence the degree of student perceived learning that occurs within blogs. To date there has been relatively little exploration of the different aspects of blogging activity and rhythm (reading, writing, writing comments for others and reading comments left by others) and specifically how these different activities may influence the perceived learning that may occur when blogs are used within HE.

Fourthly this study will seek to explore the role of previous experience and expectations within blog use. There has been some consideration within existing literature of the effect of HE teachers views of Social Media and blogs on the use of
such tools by students but again this has not been fully explored in relation to blogs within HE teaching and learning and the effect of such factors on the manner in which students will use blogs.

Finally, this research will also seek to create a research framework for blogging within HE teaching and learning. This model will be empirically tested and will explore the relationships between the different factors identified above. This framework will provide an indication of the way in which differing perceptions held by students may affect the way in which blogs are used and ultimately the degree of learning that is perceived by students to have occurred when using blogs. It is anticipated that such a framework would be useful for educators who are seeking to use such tools within their teaching as well as for policy makers who are deciding whether to invest funds within such developments. This framework may also be useful for educational managers seeking to explore the use of blogs for teaching and learning with HE teachers for students who may be using blogs within their studies and may gain from a better understanding of the value of blogging within HE teaching and learning within UK and US.

1.3 Research Aims and Objectives

Before commencing this research, it is necessary to clarify the research aims and objectives for this study. The main aim for this research shall be:

To investigate the degree to which the use of blogs for teaching and learning within the UK and US higher education leads to higher levels of perceived learning in relation to the pedagogical position, technological position, blogging expectation and previous experience of students.

In order to achieve the aim identified, the following objectives will be set:

1. To identify the main technological positions that may influence the manner in which HE students use blogs for teaching and learning within the UK and US.
The manner in which students relate to technology and specifically Web 2.0 technologies is likely to have an influence on the way in which HE students perceive the use of Social Media tools such as blogging not only for teaching and learning but also within their personal lives. Within this study, the way in which students relate to technology will be explored and its influence upon the use of blogs for HE teaching and learning will be outlined. In order to address this objective, the nature of students as a digitally immersed generation will also be explored and examined in detail.

2. To identify the main pedagogical positions that may influence the manner in which HE students use blogs for HE teaching and learning within the UK and US.

The way in which students relate to teaching and learning through their pedagogical position is also likely to have an influence on the way in which HE students perceive the use of Social Media tools such as blogging for teaching and learning. Within this study, the key different approaches to teaching and learning that are considered to be most influential will be explored. The role of pedagogical position on the use of blogs will be examined and outlined in detail.

3. To explore the influence of blogging expectations and previous experience upon the use of blogging for teaching and learning by HE students.

The study will address this objective by considering the effect that expectations of blogging and previous experience will have on HE students undertaking a blogging activity. This will provide an opportunity to explore the manner in which previous positive or negative experiences may influence future usage of blogs. The study will also consider the manner in which HE academic staff may influence students in their use of such tools.
4. To identify the different types of blogging activities that take place when HE students are using blogs for teaching and learning and exploring the relationship between these activities and successful use of blogs.

The study will address this objective by considering the different activities that occur within blogs and examining the ways in which these activities may influence the degree of perceived learning that occurs within the blog. The degree to which the different types of activities within the blog may be influenced by technological position, pedagogical position, expectations of blogging and previous experience will also be explored.

1.4 Significance of Research

As the development of Social Media and Web 2.0 technologies has continued and increasingly use of such tools are seen within our personal lives it is inevitable that their transfer into education has been explored. Using such tools within education is not without its issues however and using such tools always requires some form of investment in terms of time, cost and development. Furthermore, the transfer of such tools is not universally welcomed amongst educators (although some have embraced such technologies) and therefore some training, support and policy development will be needed before such tools are accepted as a legitimate tool for use amongst all educators. In reality existing use of such tools for teaching and learning is generally on a small-scale and localized and generally implemented due to the personal interest of the teacher (Caruso & Kvavik, 2005; Greener, 2009; Nambiar & Thang, 2015).

Where Social Media tools have been introduced into HE education one of the most popular forms has been blogs (Al-Qallaf & Al-Mutairi, 2016; Moran, Seaman & Tinti-Kane, 2011). It is therefore blogs which are being considered in this study. It is the successful implementation of blogs and ease of their use that has led to their success within the classroom. Blogs are considered to have been more widely implemented than other tools (Moran, Seaman & Tinti-Kane, 2011) The success of using blogs within education has however shown mixed results (Deng & Yuen, 2011;
Kim, 2008). The majority of research to date is anecdotal or small scale and largely produced by those who have chosen to employ blogs within their classroom (Bennett, Maton & Kervin, 2008; Jones, 2010; Waycott et al, 2010; Neira-Pineiro, 2015). By choosing to employ blogs within their classroom this suggests a desire to use such tools as part of their teaching and therefore a comfort level with using such technologies in general.

Additionally, there has been relatively little empirical research that has explored the degree to which the use of blogs will lead to higher levels of perceived learning (Teo, 2013; Akcayir et al, 2016). As the overall objective of HE teaching and learning will be to increase learning this seems to be a vital area that must be explored before the wider adoption of blogs for teaching and learning is undertaken.

This study thus seeks to address this fundamental issue and will explore the degree to which students perceive learning to occur when using blogs. This study will also seek to determine whether there are circumstances in which blogs may be more successfully used than others such as when a certain pedagogical position is taken or a particular technological position. This therefore represents a significant topic of research within this area and intends to provide a useful framework for those intending to use blogs for HE teaching and learning in the UK and US in the future.

Providing a framework for the use of blogs within HE will also be of use to educators and students who are wishing to use such tools within their teaching and learning both within the UK and US and in other parts of the world. The framework will also provide some practical indications of how success can be achieved when using blogs within HE which will be of use to policy makers and educational managers wishing to introduce such approaches into their institutions.

1.5 Research Context

When exploring the academic literature and key developments within the area of educational technology it becomes apparent that much of the latest research and development is undertaken within economically advanced countries such as the UK and US (Lai & Hong, 2015). The UK and US are considered to be leading countries in the development of educational technology (Scopus, 2016). The UK and US also
have significant similarities such as language, GDP, unemployment levels, gender breakdown and technology usage. (Graphicq, 2015).

It is important to be aware that there are also a number of difference between the UK and US such as size of population (Graphicq, 2015) and more specifically there are some differences between the educational systems of the UK and US including the length of study, the organisation of Universities, style of study, cost and nature of programmes. The nature of these differences is not expected to impact upon the results of this study. The differences between the results in this study will also be tested and analysed before being reported. This will be discussed in more detail in Chapter 5. This study therefore focuses on the use of blogs for HE teaching and learning within the UK and US.

1.6 Research Outline

This thesis contains seven chapters which are outlined below:

Chapter One provides a brief introduction to the study. It provides the background to the study, the research gap and contribution, the research aims, objectives and questions for this research and the significance and structure of the thesis.

Chapter Two provides a review of the literature relating to the use of technology and blogs within teaching and learning, the role of pedagogy and different approaches to learning within higher education teaching and learning and the use of Social Media and blogs within higher education teaching and learning.

Chapter Three presents the research model and discusses the development of the hypotheses to be tested within this study.

Chapter Four explores the research methodology and research design for this study. It discusses the philosophical assumptions, the paradigm of enquiry, the research approach, the research methodology and design methods for this study. This chapter also discusses the operationalization of the research model including the variables
and constructs design and the statistical technique used to analyse the data collected. Within this chapter, the pre-testing phase of the research is also discussed.

Chapter Five presents the results obtained from the study. This chapter starts with descriptive statistics that are used to describe the samples and to check the statistical assumptions of the study. Following this, the measurement model is assessed for reliability and validity. Finally, the structural model is evaluated and the hypotheses of this research are tested.

Chapter Six provides a discussion of the results. This chapter commences with a summary of the main findings of this research. The findings are then discussed in relation to the literature discussed in Chapter Two. In this chapter, the research questions are addressed and discussed in detail.

Chapter Seven is the final chapter and will conclude this thesis. In this chapter, the research aim; objectives and questions will be linked to the findings of the study. The theoretical and practical implications of the study will be discussed and the limitations of the study will be identified. Finally, areas for future research shall be identified.

The next chapter, Chapter Two, is the literature review. This will commence by discussing the use of technology by students within Higher Education.
2. Literature Review

As the use of Web 2.0 technologies and specifically blogs have exploded in popularity in the last decade there has been an increasing amount of literature and academic discussion concerning this area. In order to gain a better understanding of the way in which research in this area has developed and how the use of blogs are now used within education, a review of literature within this area will now be undertaken. This chapter seeks to explore the way in which students are defined according to their use of technology and how the use of Social Media, and more specifically blogs may be used within higher education teaching and learning to enhance the student learning that occurs.

This chapter will commence by discussing literature relating to the use of technology by students in Section 2.1. This will include the manner in which students’ expectation of technology are now being defined by different terms such as the Net Generation (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott, 2009; Fisher & Newton, 2014), Digital Natives (Prensky, 2001b, 2001a, 2010, 2012), Digital Learners (Gallado-Echenique et al, 2015) and the IGeneration (Rosen, 2010, 2011, Rosen et al, 2013). Following this the nature of teaching and learning shall be explored in Section 2.2. (Piaget, 1926; Vygotsky, 1962; Wenger, 1998a). Following this Section 2.3 will show that there are clearly applications for the use of web technologies and more specifically Social Media tools such as blogs (Crook, 2012) within teaching and learning to date.

In Section 2.4 the use of Social Media and specifically blogs will be discussed in more detail in order to gain a better understanding of what these tools are and how they can be used by students within education. Following this the use of blogs for teaching and learning will be discussed in Section 2.5 and specifically how the use of blogs may be influenced by the attitudes of staff, attitudes of students and the introduction of new pedagogical approaches (Garcia, Brown & Elbetagi, 2012, 2013, 2014). This chapter will then conclude with a summary of the literature and discussion that has been covered within this chapter.
The first section of this chapter (Section 2.1) will therefore discuss the technology expectations of students in more depth.

2.1 Technology expectations of students

It is increasingly argued that there is a generation of students entering Higher Education today and in the near future, that come from a different perspective than any previous generation. This is driven by the changes in technology that have occurred towards the end of the 20th and beginning of the 21st Century such as the increase in the use of Social Media and blogs. This generation has been described by various titles including the Net Generation (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott, 2009; Fisher & Newton, 2014), Millennials (Doherty, 2005; Howe & Strauss, 2000; Lancaster & Stillman, 2010), Digital Natives (Prensky, 2001b, 2001a, 2010, 2012; Vodanovich, Shen & Sundararam, 2015; Suler, 2015), Digital Learners (Gallado-Echenique et al, 2015) and the IGeneration (Rosen, 2010, 2011; Rosen et al, 2013).

Frequently these terms are used interchangeably but differ in terms of the start and end dates attributed to these new generations. In reality however there are some key differences between these terms that require further exploration. In order to understand how these generations, differ more clearly three different terms will be explored in more detail. These terms have been chosen due to their popularity and high profile within the academic literature. These are the Net Generation (Oblinger & Oblinger, 2005; Tapscott, 2009), Digital Native and Digital Immigrants (Prensky, 2001b, 2001a, 2010, 2012; Vodanovich, Shen & Sundararam, 2015; Suler, 2015) and the more recently proposed definition of the IGeneration (Rosen, 2010, 2011; Rosen et al, 2013).

In order to gain a better understanding of the manner in which these terms both differ and agree an analysis of the Net Generation shall first be given followed by that of the IGeneration. Following this the manner in which these generations may differ to previous generations as outlined in the concept of Digital Natives and Digital Immigrants shall be discussed.
2.1.1 The Net Generation

The Net Generation is generally considered to be the first generation that have grown up engaging with digital media and therefore they are expected to have a natural affinity with technology, being able to intuitively use technology and more specifically the internet often as a first choice of information source (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott, 2009; Fisher & Newton, 2014). This generation is further defined by Oblinger & Oblinger (2005) as being characterised as digitally literate, always connected, desiring an immediate response, experiential, social, visual, and craving interactivity. This definition would appear to be supported therefore by a number of authors and would appear to reflect the nature of these students well.

These are qualities that are supported by Frand (2000) who considers that there are ten attributes that characterise students:

- Computers aren’t technology – if you can remember the first time you used it, it is technology if not it is an expected norm
- Internet is better than TV – everything you need is available on the internet
- Reality no longer real – what you see and hear cannot necessarily be believed
- Doing rather than knowing – what you can do is more important than what you know
- Nintendo over logic – trial and error is encouraged
- Multitasking is a way of life
- Typing is preferred to handwriting
- Staying connected
- Zero tolerance for delays
- Consumer / Creator blur

However, whilst the characteristics identified above are considered by many authors to describe well the nature of students entering Universities today many have progressed further in their definition. This is understandable given that the
characteristics described by Frand were constructed in 2000 at a point at which Internet technologies were only beginning to be introduced into everyday usage. Changes since then have therefore led to a new definition of this generation as the IGeneration (Rosen, 2010, 2011; Rosen et al, 2013) demonstrating the manner in which technology has continued to evolve and as a result the nature of students has also changed as they continue to engage with new technologies at an increasingly young age.

2.1.2 IGeneration

The concept of the IGeneration does not represent a rejection of the concepts of the Net Generation but rather shows how technology has continued to change the nature of students. The main difference between the Net Generation and the IGeneration is the manner in which the students that are now reaching our Universities and Colleges may be considered to be not just characterised as digitally literate but also immersed in digital environments utilising media to as great an extent as possible for entertainment, communication and a number of other tasks and activities. In addition, these students are adept at multi-tasking (Calderwell et al, 2016; Teo et al, 2014), communicating electronically and social networking to a great extent. These students are additionally expected to be the first to want to try and evaluate new technology (Rosen, 2010).

Further distinctions between the IGeneration and the Net Generation include the manner in which they will use mobile phones for texting far more than talking, will be persistent bloggers and v-loggers, will be highly social and finally whilst not undertaking a great deal of communication face-to-face will have many meaningful connections with people online (Rosen, 2010). Allan (2007) considers that students of this generation will additionally have expectations of technology as enabling intense and very flexible learning as we move to an increasingly 24/7 culture with changed patterns of work and leisure and due to the increased pressures and opportunities of greater globalisation.
Consequently it is unsurprising that the IGeneration are considered to have come to expect technology to be present within their everyday lives, including within their education studies (Beetham & Sharpe, 2007; Philip, 2007). It is therefore considered that this expectation that is leading to a disparity between the expectations of students and the education system that is on offer, as the education system that we currently operate is based on a system formed at the beginning of the industrial age (Tapscott, 2009; Sims, 2014). Whilst it is clear that educational systems have moved on since the industrial age the point made by Tapscott does demonstrate the sometimes-slow moving pace of change within HE education.

Whilst change is therefore considered not to have occurred within the educational system, Tapscott (2009) does consider that the nature of the IGeneration has resulted in a change of the knowledge hierarchy between HE teacher and student. Tapscott (2009) believes that this relationship has been transformed and reversed and has resulted in a fundamental change in the power dynamic between the student and HE teacher.

Whilst this change has not gone unnoticed within the HE sector and the rise of technology and specifically the use of web technologies has, to some extent, changed the nature of HE teaching and learning, the sector cannot as yet be considered to be fully engaged with the needs of the IGeneration (Rosen et al., 2013).

It should not be assumed however that there is anything necessarily wrong with the content or the delivery of current Higher Education provision but rather that some lecturers within Universities are still adopting the educational strategies that were used for themselves or their student’s parents and grandparents (Tapscott, 2009). This does not therefore allow for the fact that there is now a new generation of students who have qualities in relation to their understanding of technology and learn within an entirely new way when compared to these previous generations (Rosen, 2010, 2011; Rosen et al, 2013).

Within this study due to the similarity of the terms Net Generation and IGeneration both of these terms will be explored in more detail. Within this thesis these terms will
collectively be entitled the Web Generation. Both of these terms have also been chosen due to the manner in which these terms should define students who are currently progressing through HE today. These definitions have also been chosen due to its more recent development. These definitions demonstrate how the current generation of students have grown up using technology. This leads to a number of commentators considering that this generation learn differently from any previous generation. It is argued that this becomes most obvious when students interact with their parents who do not appear to instinctively understand how to use the new technologies that are available (Doherty, 2005). The nature of these differences have been most notably highlighted by Prensky (2001b) in a definition of students today as Digital Natives whilst their HE teachers and adults surrounding them are known as Digital Immigrants. In order to understand the Web Generation from the perspective of the Digital Natives / Digital Immigrants theory this will now be discussed further.

2.1.3 Digital Natives

The concept of Digital Natives is one that has received a great deal of support and criticism within the last few years. The concept is largely based on the work of Marc Prensky (2001b) who highlights a fundamental difference between ‘students today (who) are all “native speakers” of the digital language of computers, video, games and the Internet.... (and) ... those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology... and always will be compared to them.’ Prensky thus defines this new generation as Digital Natives and previous generations as Digital Immigrants. Digital Immigrants are defined as having been required to accommodate technology, always retaining their digital “accent” as opposed to the assimilation of new technology that Digital Natives achieve (Tapscott, 2009).

It is argued that the problem for Digital Immigrants is that however comfortable and capable they are with new technologies they will always be expected to retain their “analogue” background (Gibbons, 2007). This results in Digital Natives being on “a
collision course with their technology illiterate HE teachers, who speak digital as a second language...’ (Doherty, 2005).

For Kennedy et al. (2008) the difference between Digital Natives and Digital Immigrants does result in a fundamental problem for the teaching of Digital Natives by Digital Immigrants. This is due to the manner in which the Digital Native are considered to wish to be taught would be irreconcilable with existing teaching styles and the approaches of Digital Immigrant teachers. This therefore results in a disparity for HE teachers who now need to adapt their teaching methods to meet with the requirements of the new generation of learners with which they are not familiar.

As the internet, has continued to develop further, definitions have been developed to expand on the concept of Digital Natives. Feeney (2010) in fact considers that a number of further categorisations of digital awareness may also be useful and proposes the additional inclusion of the following categories to the original proposed concept:

- **Digital recluse** – Absolutely refuses to knowingly use electronic technology
- **Digital refugee** – Uses technology unwillingly. It has been thrust upon him/her by his/her environment. Although using technology is a chore, not using it is even more of a challenge
- **Digital immigrant** – Has willingly travelled to the land of technology. Although unfamiliar with the full potential of various electronic tools, s/he holds an underlying belief that technology can be a useful tool.
- **Digital native** – A person in this category uses technology in executing a wide variety of tasks and readily adapts to changes in the tools that s/he uses.
- **Digital explorer** – Pushes electronic tools to the limit and is always on the lookout for new tools that do more, work faster, and work more easily.
- **Digital innovator** – Doesn’t just look for new technology tools, builds new tools and/or adapts old tools to new purposes.
- **Digital addict** – Highly dependent upon technology tools. Becomes quite distressed when access to technology tools is disrupted.
If the differences between individuals are assumed to be correct and already determined this would result in a significant and fundamental difference not only between Digital Immigrants and Digital Natives but also all of the categorisations in between. Whilst this in itself represents a significant issue for education, Prensky (2001a) in fact goes further than this and defines today’s students as thinking and processing information in a fundamentally different way than any generation before, resulting in a change in the physicality of the brain and whilst this may not be widely supported it does receive some support from other authors (Hotchkiss, 2009; Interlandi, 2008; Tapscott, 2009; Woods, 2006).

It is important to note that the original work completed by Prensky was first published in 2001 and therefore it is likely that the changes to technology have affected the manner in which these theories may be applied. In fact Prensky (2010, 2012) later retracted the claims that changes are physically made to the brain and instead stated that knowledge of technology, or lack of it, does not necessarily define whether an individual is a Digital Native or Digital Immigrant. In fact even if an individual knows relatively little this does not necessarily result in them being less of a digital native as it is in reality about mind-set than specific knowledge of technologies (Prensky, 2010).

It is largely accepted that these definitions of changes to the physicality of the brain are largely irrelevant and incorrect when considering the wider concept of Digital Natives (Church, 2010; VanSlyke, 2003; Woodworth, 2011). It is also argued that although this represents a problematic area of the concept, this aspect of the theory continues to be proliferated even after the primary authors of this argument have been considered to have distanced themselves from being associated with this concept (Handley, 2011; Jones et al., 2010; Waycott et al., 2010).

Whilst it is clear therefore that the concept of changes to the physicality of the brain may not be relevant to the Web Generation and despite the controversy surrounding the concept there is still relevant debate surrounding the concepts of the Net Generation, IGeneration and Digital Natives. The critiques of these theories can largely relate to the same fundamental issues, namely, the homogenous nature
ascribed to the generation, the technology use ascribed to the generation and the belief that there are substantial differences between natives and immigrants.

2.1.4 The Homogenous Generation

One of the primary criticisms of the Web Generation (including Digital Natives and Net Generation and IGeneration) relates to the manner in which generalisations are made relating to all individuals thereby assuming that the Generation consists of a homogeneous population who get a “universal and uniform” upbringing (Kennedy et al., 2008; Sanchez et al, 2014).

However generalisations such as these can fail to recognise the range of technology skills, knowledge and individual predilections amongst students (Kennedy et al., 2008; Bennett, Maton & Kervin, 2008; Teo, 2013; Somyürek & Coşkun, 2013; Lai & Hong, 2015). Additionally in relation to education specifically, high usage of technology does not appear to represent an increased desire for students to use such technologies within a classroom environment (Kennedy et al., 2008). Whilst some students have embraced new technologies this does not represent a universal adoption outside of the UK and the US, usage of technology and hence the IGeneration phenomenon will not generally be seen (Church, 2010). It should be noted however that the majority of existing literature will relate to studies within the US and UK and so any inferences made will be based on the generation under review in the US and UK only.

In general therefore it does appear that there may be a growing viewpoint, formed from theoretical and empirical studies, that suggests that the concept of a specifically defined new “digital generation” which has common features entirely based on their experiences with technology during their lifetime is not true (Jones et al., 2010). There does appear to be general agreement however that the “conditions,” in terms of technology use and availability that would allow for a Web Generation to form does exist. Perrin (2015) report, for example, that young adults are the most likely generation to use Social Media. They also however report that there are differences in the use of Social Media by other categorisations such as gender, education level and household income (Perrin, 2015). Rather than asking whether the Web
Generation does exist the question instead must relate to whether students entering University today are all members of the Web Generation and in fact whether the Web Generation is homogenous and all of this generation do use technology within all aspects of their lives. In relation to education specifically there is also the additional question that must be posed of whether those students who are part of the Web Generation and use technology extensively within their personal lives do want their “living technologies” to also be their “learning technologies” (Kennedy et al., 2008).

Considering the nature of the Web Generation can be problematic due to the manner in which individuals will view the world through a lens of their own experiences and knowledge (Oblinger & Oblinger, 2005). Researchers and educators generally will not be from the Web Generation and it may therefore be difficult for them to accept or understand the fundamental changes in a new generation that is not similar to them.

Oblinger & Oblinger (2005) nevertheless also accept that the concept of a new technologically driven generation may represent a generalization which by its definition may not be correct although they argue it is a trend that can be observed. In order to understand this generation further it is necessary to consider the manner in which they appear to use technology.

Within this study, the term Web Generation will be adopted. This term has been selected due to its representation of the majority of students who will be expected to be currently within Higher Education (Rosen, 2010, 2011; Rosen et al, 2013). Within this study, the specific term used to describe students as discussed above will not be questioned but rather the degree to which differing students within HE today considers themselves to be digitally immersed will be explored. Whilst the technological nature of students has therefore been considered, it is now important to also consider how the nature of the Web Generation will impact upon the use of technology by students.
2.1.5 Technology usage by Web Generation students

The definition of the Web Generation would indicate that students will be making extensive use of technology within their everyday lives. Whilst this definition has gained a great deal of support there have also been a number of ways in which the concept has been identified as problematic.

Primarily criticisms relate to the manner in which students are defined as being constantly connected and using technology to an advanced degree. Owen (2004) for example states that there is much anecdotal evidence that demonstrates that not all teenagers will spend a great deal of time with technology and that in actuality they will also spend time doing lots of other activities which do not involve technology as well. However, if this is the case Owen (2004) does accept that the internet has significantly altered the way in which we interact and the manner in which new technologies have allowed greater social interactions to be made.

Margaryan & Littlejohn (2008) conversely has a different perspective and considers that whilst students do have a deep knowledge of certain digital technologies, such as email and using the internet, more detailed knowledge of other technology is generally not necessarily held. This therefore indicates that the manner and degree to which technology is used, in addition to its effect, cognitively, on individuals may be overestimated and is at the very least unproven at this point (Margaryan & Littlejohn, 2008). This is further demonstrated in the manner in which the majority of activities that students undertake on the internet consist of relatively passive activities such as searching Wikipedia or Google rather than collaborating or writing as Web 2.0 tools now allow (Salajan, Schonwetter & Cleghorn, 2010; Gulsecen et al, 2015). The view therefore that a generation exists that is inherently comfortable and adept at using digital technologies is rejected by a number of commentators (Bond, 2008) with some considering it to be a view which is largely ahistorical and a view formed mainly from rhetoric (Margaryan & Littlejohn, 2008).

Bennett (2008) proposes that the concept of the Web Generation must be rejected due to the manner in which internet users will be expected to differ depending upon both age, socio-economic background and the context in which technology is being
used, even amongst a relatively small group of students. Bennett (2008) also considers that there is an inherent unfairness that will result in the generalisations made in theories such as these will lead to a focus on the those individuals who meet the criteria of this generalisation, generally in this case those who are technically or technologically adept (Bennett, Maton & Kervin, 2008).

Whilst there is some debate concerning the nature of the Web Generation as an inherently technological generation those proponents of the Web Generation consider that this instead demonstrates a lack of acceptance of technology by previous generations, namely Digital Immigrants who are often the gatekeepers to student use of technology (i.e. HE teachers, parents, etc.) and who are able to prevent the Web Generation (Digital Natives) from achieving their true desired use of technology. The concept of Digital Natives and Digital Immigrants is itself a highly debated term in so far as commentators argue that the belief that individuals can be grouped entirely into two categories is problematic and can be considered to be misleading (Salajan, Schonwetter & Cleghorn, 2010). Therefore, it is important to consider the nature of this concept in more detail.

2.1.6 Digital Natives versus Digital Immigrants

Overall the concept of Digital Natives and Digital Immigrants can be considered to have entered the consciousness of interested researchers and educators however increasingly the term has been the subject of increased dissent. In practice, there have been mixed results in attempts to determine whether students are Digital Natives and whether parents and HE teachers can be defined as Digital Immigrants although some studies have shown support for the concept.

Guo (2008) is amongst authors who have conducted research into the concept and have found that there was no significant statistical difference between those who would be identified as Digital Natives and those who would be identified as Digital Immigrants. In their research, they therefore consider that the concept has been misinforming and diverting researchers and educators. This is further supported by
the research of others (Jones, 2010; Margaryan & Littlejohn, 2008; Waycott et al., 2010).

Not all commentators agree, however, and perhaps the most valuable manner in which to consider the definition is not as intrinsically unsound but is rather as a fair and expected observation of the manner in which individuals change and deal with changes such as the rise and development of the Internet within their lifetime (Salajan, Schonwetter & Cleghorn, 2010).

Interestingly, the debate surrounding the digital native concept has led to the development of new understandings of the ways in which individuals may use technology. For example, the theory of Visitors and Residents proposed by White (2008) and White & Le Cornu (2011) who further build on the concept of Digital Natives and Digital Immigrants by considering that internet users can instead be defined as visitors or residents. Internet visitors are individuals who use the internet as a tool only when they specifically need information and internet residents are individuals who live a significant part of the lives within the internet (Connaway et al, 2013). This therefore provides a differing form of distinction between those who choose to significantly engage with the internet and those who do not.

The importance perhaps of this model is the way in which individuals are considered to be able to have different roles depending upon the area of their lives for which they were going online i.e. professionally or personally and this may further provide some indications of the complexity of the conceptualisation of a categorisation of people based solely on their age and experiences of technology. The manner in which these concepts can be applied to education are therefore an important consideration.

2.1.7 The Web Generation and Digital Natives in education

Whilst there can clearly be seen to be some debate regarding the concept of the Web Generation and more specifically the manner in which the Web Generation, as Digital Natives, will interact with Digital Immigrants it is imperative to consider what
impact this concept will have on the manner in which the Web Generation will be educated.

As discussed in the previous Section (2.1.6) the nature of students as fundamentally different from their parents and HE teachers will result in a need for educators to potentially reassess the manner in which they teach. This must include the pedagogies they use and will require the focus to be placed on the way in which students best learn rather than the preferences and teaching style of the HE teacher. Fundamentally the concept of the Web Generation should be encouraged to learn in a collaborative manner thereby potentially removing feelings of isolation (Tapscott, 2009).

Gibbons (2007) proposes that for the majority of educators this will prove to be a difficult process as HE teachers will traditionally base their understanding of today’s students experience and preferences on their own experiences of education. The consequence of this view is that the preferences and experience of HE teachers is almost certain to be based on a Digital Immigrant perspective of technology or at the very least will be based on the experiences of teaching a generation ago when teachers were being taught. For Tapscott (2009) education can currently be considered to be lagging at least 100 years behind and is, in reality still based on principles developed in the industrial age. This accordingly results in a constant generation lag whereby the previous generation will always educate the next generation in the manner in which they believe to be most effective from their own perspective (Tapscott, 2009).

As a result of the way in which technological change is occurring according to the views of commentators such as Tapscott (2009) it can be assumed that Higher Education institutions could be seeing a divide between HE teachers and students in the manner in which they are both able, and would choose, to use the internet (Jones, 2002). Whilst this view was first expressed in 2002 it can still be considered to be of relevance today and is a divide which still exists within educational institutions (Dornisch, 2013).
Whilst the nature of the Web Generation and the majority of characteristics of this generation would suggest that there will be a general desire for technological use within education the majority of reports suggest that this is not the case. In reality it is also reported that the majority of students who could be called members of the Web Generation would not wish to undertake online courses or distance learning (Chisholm, 2006; Jones, 2002).

Barnes, Marateo & Ferris (2007) exemplify this by suggesting that whilst students may be Digital Natives and members of the Web Generation they do not necessarily have the ability to understand the ways in which technology may be used and able to affect their learning experience or education. Therefore, whilst education can be considered to be able to alter and even be improved by incorporating greater degree of technology within learning, the use of such systems may not be maximised even if they are introduced as a response to the perceived needs of the Web Generation (Barnes, Marateo & Ferris, 2007; Livingstone, 2009; Selwyn, 2009). It is argued that when technology is introduced into learning the Web Generation’s response to this is limited to playing games, texting and retrieving information from the Web and does not include producing and sharing self-created content (Luckin et al., 2009).

If such technology is introduced its failure can therefore lead to considerations that the calls for change within our educational systems are lacking in critical thinking, under-theorised and lacking strong empirical foundations (Bennett, Maton & Kervin, 2008; Jones, 2010; Waycott et al., 2010; Lai & Hong, 2015). It is important to be aware that this is not the case in all instances but is often the case when technology failures occur.

It is however likely that if students are using technology such as blogs, due to their Web Generation characteristics, they would be able to well utilise any technology employed within their education. It is also suggested that students would be able to easily understand the manner in which technology could advantageously support their learning, particularly where there is evidence of existing informal learning occurring online already. Even where students would be accepting of technology it is essential to consider that the use of technology within education is most often determined more by the lecturer than by students. The role that HE teachers will
have in setting both the activities involved within the classroom, the tools used and the pedagogical perspective adopted are therefore increasingly important to consider (Chen et al, 2015).

It is interesting to note for example that expectations and previous experience are considered to be one of the primary ways in which behaviour will be shaped. It also is reported that students rely on the views of their lecturers for ideas relating to the way they behave within the educational environment (Kayondo, 2015). Therefore students are most likely to follow the pedagogical and technology choices of their HE teachers which are mostly likely to be based on traditional pedagogical approaches utilising only minimal levels of technology (Margaryan & Littlejohn, 2008). It is important to be aware however that not all HE teachers will choose to base their teaching on traditional pedagogical approaches and some will actively seek to use more innovative teaching methods such as the use of blogs.

As a result of these mixed approaches it is suggested that students may not propagate the use of technology within the classroom instead relying on teaching staff to choose the learning environment, HE teachers who may be considered to be digital immigrants. It is also likely therefore that as students become HE teachers they will also base their teaching practice on their own experiences of teaching and thus the lack of change is likely to be perpetuated where teachers have not been using innovative teaching methods. It is important to note however that this is a generalisation that cannot be attributed to all HE teachers.

In addition, the emphasis for change may as a result need to be located within the mind of the educator as opposed to the student. This is somewhat paradoxical as educators, as Digital Immigrants, may find it difficult to understand the manner in which Social Media tools and specifically blogs could be used within education. However, before considering further the use of technology within teaching and learning it is first necessary to consider whether there is a relevant pedagogical perspective which would support the use of technology and more specifically blogs as means of supporting students from the Web Generation. This will therefore now be discussed in more detail in Section 2.2.
2.2 Teaching and Learning

Traditionally teaching and learning within the Higher Education Institutions of the UK and US has been largely rooted in the behaviourist traditions of the late 20th century. This is evidenced in the manner in which the majority of delivery is conducted through instructional and instructional models of teaching (Illeris, 2007; Jonassen & Land, 2000; Sherman, 2006).

Throughout the 20th century and into the early 21st century these instructional approaches to teaching and learning have been the preferred manner of delivery for most academic staff. Within this approach the learner plays a relatively passive role within the learning process and learning is considered to have a starting point, a definitive ending and is completely separate from other activities (Wenger, 1998a) and therefore it not best suited to the use of Social Media tools such a blogs which are interaction and constructionist. Importantly however this approach, as a successful form of learning, has been questioned (Rosen, 2010). This is particularly the case as significant trends in learning such as the use of blogs are changing the nature of teaching and learning within the 21st Century.

Tapscott (2009) for example considers that as a result of the rise of Web 2.0 such as blogs there has been an increasing move towards an era of lifelong learning in which what is critical is not what you know but rather what it is possible for you to learn. In this respect, the focus of learning must be on enabling students to learn throughout their lives and to use tools such as blogs in order to learn. Siemens (2004) further outlines the changing nature of teaching and learning within the 21st Century as holding the following characteristics:

- Many learners will move into a variety of different, possibly unrelated fields over the course if their lifetime.
- Informal learning is a significant aspect of our learning experience..... Learning now occurs in a variety of ways – through communities of practice, personal networks, and through the completion of work-related tasks.
- Learning is a continual process, lasting for a lifetime.
- Technology is altering (rewiring) out brains
• The organisation and the individual are both learning organisms.
• Many of the processes previously handled by learning theories.... can now be off-loaded to, or supported by, technology,
• Know-how and know-what is being supplemented with know-where (the understanding of where to find knowledge needed).

In suggesting changes such as these Siemens (2004) also proposes that the nature of learning has changed. The characteristics identified above are therefore given within the context of an understanding of learning as occurring within a networked manner. Whilst this is the case the characteristics identified have not passed unnoticed within educational institutions with a number of researchers and commentators suggesting that this, as discussed in the Digital Natives / Digital Immigrants divide above, is resulting in a widening gap between the experiences of students at their educational institution and within their social lives particularly in relation to students’ use of blogs within their personal lives. This is resulting in a “mismatch” between learning that takes place independently and that which is directed by teachers within the classroom.

Students are therefore being required to work within a “pedagogic regime” which is based on mainly instructionalist or behaviourist theories and adopts the learning of uncontextualised knowledge within educational institutions. The issue here is that this is considered to be fundamentally different to students’ preferences for learning (Margaryan & Littlejohn, 2008). It is important to remember however that technological trends such as the use of Social Media and blogs should not dictate the manner in which learning should take place but rather we should be trying to ensure that an appropriate pedagogy drives any use of technology such as the use of blogs (Kennedy et al., 2008).

The changes that have been seen in the use of Social Media such as blogs within the last few decades have in reality occurred in tandem with fundamental changes in pedagogical paradigms and leaning theories which have moved from behaviourism towards theories relating to cognitivism and later constructivism (De Villiers, 2007). It is the combined nature of both of these fundamental changes that is resulting in a
swift change in the manner in which pedagogies within our educational institutions are being questioned today.

It is perhaps the changes identified above alongside the continual growth of knowledge that is leading to an increase in alternative theories of teaching and learning and a rejection of the traditional instructional design of teaching. According to Jonassen and Land (2000) we reached a new epoch in learning in 2000 in which learning was no longer a submissive or transmissive activity. For these authors learning instead becomes a process that is based on active, constructive and knowledge building activities and which better meets the needs of students who are using blogs within their studies. Furthermore they consider that there is a very fundamental human change that needs to occur in which we no longer accept the concept that behaviour and the mind are separate entities (Jonassen & Land, 2000).

It is this rejection of more instructionalist models of teaching and learning and an acceptance that students may want to undertake more active than passive learning (Doherty, 2005) that is of most interest in relation to the Web Generation and students using blogs. One of the major theoretical responses which intrigues educational researchers more and more and which forms a more learner sensitive model of teaching and learning (Kumpulainen & Wray, 2002) has been the growth of cognitive and constructivist theories of learning, which although not new, could be most closely aligned to the context of the needs of the Web Generation and particularly to blogs.

2.2.1 Cognitive Development Theory

One of the first moves away from the behaviourist traditional paradigms of teaching and learning theories was proposed by Jean Piaget in 1926 and is generally known as cognitive learning theory. This is based on the premise that children construct knowledge and undertake learning from the experiences they have and the interaction they have with their environments (Ormrod, 2003).
However, whilst Piaget’s theory is intrinsically linked with experience and interaction, Piaget also assumed that development must occur in specific and known, measurable stages (Piaget, 1926). A key part of Piaget’s theory is therefore that development will occur at set times which occur regardless of the experience an individual has had. The theory is based on a “universal characteristic” and assumes that each individual will reach each development stage at approximately the same time and age and cannot be reversed (Piaget, 1926). Additionally, Piaget’s theory assumes that each individual brain develops to the same extent in terms of the parts which will affect learning. Furthermore the body also will be required to be balanced and fully energised in order for learning to be undertaken and not create imbalances (Illeris, 2007).

The development stages undertaken are defined by Piaget (1926) as follows:

i) The sensory-motor period (birth to 18-24 months)

ii) The pre-operational stage (2 to 7 years)

iii) The period of concrete operations (approximately 12 years)

iv) The period of formal operations (teenager)

This is important as students will be at the point of formal operations by the time they reach Higher Education and after the period of formal operations whilst learning will still continue to take place the basic structure of the brain will have been formed and further changes to the fundamental structure of the brain will not be able to be made (Cohen, 1983).

The central tenet to Piaget’s theory is the manner in which individuals create mental schemes which are the things that have previously been learnt and the individual is now able to do and are grouped together in terms of thoughts and actions (Ormrod, 2003). From the basis of these schemes, according to Piaget (1926), an individual will aim to ensure that they are able to achieve continual equilibrium and this will be undertaken through the processes of assimilation and accommodation. Within Piaget’s theory assimilation refers to the process through which an individual will deal with objects and events in ways which are consistent with their existing schemes (Ormrod, 2003). Accommodation is defined as the manner in which active
modifications of the structures themselves will be undertaken in order to adapt to the input (Boden, 1995).

Within this context therefore new experiences will either be assimilated into an existing scheme or eventual accommodation will occur within an individual’s mental processes which will result in a form of knowledge construction through a process of equilibration (Ormrod, 2003). This is contrary to the previous beliefs of behaviourist paradigms which focus on the processes of knowledge discovery (Boden, 1995) and can be seen to occur within the context of learning within a blog.

Whilst Piaget’s theory of learning represented a departure from behaviourist perspectives of learning there have been a number of criticisms of the theories proposed. For example, it is important to note that Piaget’s theories were first proposed at the beginning of the twentieth century and his ideas were only really explored and accepted within the 1960s and so whilst the concept has existed for some time, the context in which learning is now proposed to occur, utilising technology and supporting the Web Generation will be substantially different from the environment within which Piaget was working.

Additionally, whilst Piaget’s theory deals with the cognitive aspects of learning, it does not deal with emotional issues, (Illeris, 2007) or social and economic issues (Cohen, 1983). Piaget has also faced criticisms concerning the manner in which his theory was formed in relation to the experiments he conducted, his methodology and assumptions about the logic and rational nature of children and teenagers and additionally the focus and definition of his research (Cohen, 1983; Illeris, 2007).

Further criticisms have related to the way in which the concept of specific, discrete stages to development are flawed and in reality, a more gradual trend may better represent the way in individuals learn (Ormrod, 2003). Holmes and Gardner (2006) conversely do consider that Piaget has been to some extent unfairly criticized for appearing to deny the ability for skills to be accomplished in any order other than the linear order formed by Piaget. Even in light of the criticisms made Piaget’s work does appear to have considerable influence within educational theory today (Holmes & Gardner, 2006).
In relation to the use of blogs within teaching and learning, this theory represents a fundamental shift away from the behaviourist traditions which promoted the instructional approaches to learning that no longer appear to meet the needs of students towards a more constructivist approach. However, Piaget’s theory does not deal with the social nature of learning which appears to be increasingly important in relation to learning in the 21st Century. In reality learning can be said to be continuously rooted within the context of social interaction and of the society within which an individual operates and therefore if the context changes, learning will essentially have different conditions (Illeris, 2007) and will need to be re-examined.

It is from this point therefore that we must consider the manner in which further approaches to learning have been developed which consider the nature of learning as social and societal as well as individual, firstly by considering social learning theory.

2.2.2 Social Learning Theory

Social learning theory, also known as social cognitive theory, is based on the premise that learning best occurs within a social and cultural context whereby individuals are able to learn from one another through collaboration or by watching what other people do (Culatta, 2010; Kim, 2001; Ormrod, 1999). This is particularly relevant to the use of blogs in education as social learning theory enables this new generation to use the skills which they are developing naturally such as the ability to multi-task, socialise, be constantly networked and to prefer graphical representations before text (Prensky, 2001b; Rosen, 2010). Social learning also aims to ensure that the student is an active participant within the learning process which represents a significant change from the more instructional model of learning that are more likely to be found within education today (Kumpulainen & Wray, 2002).

Whilst social cognitive theory has its roots in behaviourism it has increasingly incorporated the concepts of cognitive processes and now represents a blend of ideas from both behaviourism and cognitivism (Ormrod, 2003). The concepts of
social cognitive theory have perhaps become most well developed through the work of Bandura (1977) in a theory known as social learning theory.

The basis of social learning theory is the manner in which Bandura (1977) considers that “reciprocal determinism” is vital in order to achieve learning in the way in which the individual and the world interact with each other (Greener, Rospigliosi, & Shurville, 2007). ‘Social learning theory approaches the explanation of human behaviour in terms of a continuous reciprocal interaction between cognitive, behavioural, and environmental determinants’ (Bandura, 1977, pvii) and it is this incarnation of the theory that appears to have most relevance to today’s students when using blogs within their learning.

Bandura’s social learning theory is based upon the concept that learning is not solely individual activity but that individuals can also learn from one another through activities such as observation, imitation and modelling and that the positive and negative effects of these activities as witnessed by the learner will result in learning (Illeris, 2007; Bandura, 1977).

Important, Bandura considers that we are able to learn without undertaking the activity ourselves and can learn from observing examples. We can therefore learn new behaviour without a need to undertake the experience and thereby gain reinforcement as a result. In this respect it is possible for individuals to observe behaviour and store it for use in the future, if and when needed (Stangl, 1998).

In this respect Bandura acknowledges ‘that human thought, affect, and behaviour can be markedly influenced by observation, as well as by direct experience, fostering development of observational paradigms for studying the power of socially mediated experience’ (Bandura, 1977, pvii).

Ormrod (2003) has identified five basic assumptions which provide the basis of social cognitive theory. These are as follows:

1. Learning by observation
2. Learning as an internal process that may or may not be reflected in behaviour
3. Goal directed behaviour
4. Self-regulation of behaviour
5. Indirect effects of reinforcement and punishment

Each of the basic assumptions identified by Ormrod (2003) can be seen to relate to learning within the context of blogs. Within blogs learning can be considered to occur when student observe blog posts through the reading of blogs. When learning is developed through the reading of blogs this can be seen to be an internal process as this will not necessarily result in any further action on the student’s part such as posting or commenting on the post. Goal directed behaviour is less clearly seen when learning with blogs but can also be seen through the manner in which students will choose to view specific blogs and not others. This point also links closely with the self-regulated nature of learning through blogs as blogging activity will need to be self-directed to some degree as only the student themselves can choose how fully to engage with the learning process. Finally, the indirect effects of reinforcement can be seen within learning with blogs as students may be encouraged or discouraged to blog due to positive or negative feedback that the student may receive via comments.

However, there are a number of key conditions that need to be in place in order for an individual to be able to achieve successful modelling which are identified by Bandura (1977) as including attention, retention, reproduction and motivation.

A further significant aspect of Bandura’s theory considers that both reinforcement and punishment can be vicarious and thus the learner does not necessarily expect to be rewarded or punished but would expect a similar occurrence if they were to imitate the behaviour (Culatta, 2010). The vicarious nature of learning is of fundamental importance, as for Bandura, observation is considered the most significant aspect of social learning and to be the most typical way in which change occurs (Culatta, 2010; Ormrod, 2003; Stangl, 1998).

It is possible to see in relation to blogging that vicarious reinforcement and punishment could occur as students see both the positive and negative interactions
that may occur as a result of others blogging. This could relate for example to positive and negative comments as well as the actions of trolls.

It is important to note also that Bandura considers that in vicarious learning both live and symbolic models can be valuable for learning, although Ormrod (2003) considers that it is live models that are of most use as learners are able to see real life examples of activities being undertaken. Whilst this might be the case, without symbolic models and vicarious learning, all experiences would need to be first hand and this could result in a large number of laborious and hazardous experiences being undertaken by every individual (Bandura, 1977).

It is in this manner that social learning theory is considered to move beyond behaviourism and represents a bridge between behaviourism and cognitive learning theories in the manner in which it considers the effect of the learning of behaviour but as a cognitive function of learning (Stangl, 1998). However whilst social learning theory provides an advancement from the behaviourist perspective and cognitive approaches to learning previously discussed, Stangl (1998) notes that social learning theory does face the issue that it can be difficult to predict what individuals will regard as positive reinforcement.

A further problem can be seen in the nature of social learning theory’s need to assume that assimilation and accommodation are occurring within the brain when it is not possible to directly measure or capture this activity (Illeris, 2007). This results in the inability to directly measure the learning that occurs and whilst this can be seen as a criticism it also is one of the aspects of the theory that represents a departure from behaviourist perspectives of the past.

Whilst social cognitive theory therefore appears to provides a more complete explanation of learning when compared to Piaget (1926) and behaviourist theories, there are still a number of criticisms of the approach that remain unanswered. To some extent this leads to the further development of learning theories which focus on the social aspects of learning to a greater extent, known as social constructivism, which may meet more fully with the demands of the Web Generation and the use of blogs within teaching and learning.
2.2.3 Social Constructivism

Constructivism posits that ‘a person constructs his or her own comprehension of the surrounding world through learning and knowledge – which excludes any form of learning approach as a filling process on which someone, a teacher, for example, transfer knowledge and skills, to others, for example pupils….’ (Illeris, 2007).

Social Constructivism is most often attributed to Vygotsky (1962) whose social development theory focuses upon the sociocultural context within which individuals share experiences and the connections that exist between people and the sociocultural context in which they operate (Crawford, 1996). Social constructivism largely posits that learning occurs as a result of interpreting, understanding and social interaction. In this respect learners are required to consider and explain the reasoning behind their thinking and how this meets with the socio-cultural context (Adams, 2006).

This is largely contrary to the traditional instructional and behaviourist learning theories that have been previously dominant within education in so far as the focus within behavioural theories is on learning as an individual process, as opposed to social constructivism which considers learning to be a process that occurs between individuals and as a result of a social process (Illeris, 2007).

Vygotsky (1978) considered that there are three main areas of consideration for learning which are:

1. Social interaction plays a fundamental role in the process of cognitive development
2. The more knowledge other (MKO)
3. The Zone of Proximal development (ZPD)

Whilst Vygotsky (1978) focused on the development of the child there are implications for learning within the context of HE teaching and learning. This is because the work of Vygotsky and Bandura represents a departure from the more
behaviourist traditions of learning as it places learning within a social context where learners are able to learn from others who are more knowledgeable than themselves and assumes that learners will actively undertake learning through the assistance of other more knowledgeable people. These could include people such as their HE teachers, mentors or peers, for example, and learning will take place within their ZPD. Eventually individuals will then be able to become increasingly able to normalise their learning via a process of meta-cognition. In this sense therefore learning is considered to be a social activity which is able to be undertaken through interactions within the classroom (Watson, 2001).

The ZPD is considered to be the ‘space that a learner is ready to develop into useful knowledge; it also suggests that the window of learning opportunity for any individual student may be smaller than we might expect. When students say, they are totally lost, they are expressing the feeling of being outside their zone....... When this happens in a group situation or in a discussion board, the class culture needs to support the student asking a question so that he or she can get “linked” back up again’ (Boettcher, 2007).

Social constructivism also relies on the need for the student to play an active role in the learning process and concludes that learning occurs best within situations in which the student plays an active role within learning. It is also considered that where HE teacher encourage collaboration between themselves and all students learning will be further enhanced. Watson (2001) for example considers that if students are encouraged to engage in dialogue with both HE teachers and other students they may not only be able to “spark ideas off each other” but also gain intellectually stimulating experiences and learn vital social skills amongst other things.

Whilst this is a view in a number of learning theories it represents a departure for the majority of behaviourist learning theories where the learner is expected to play a passive role in learning. It is important to note that within Social Constructivism the role of the HE teacher is not eliminated but changes it to be one of creating a secure environment within which students can construct knowledge and in which social interactions can be mediated if required (Adams, 2006).
Within Social Constructivist learning the roles of the HE teacher and student are fundamentally altered. The HE teacher is, in this learning paradigm, expected to form a collaboration with students and enable a facilitation of meaning and knowledge construction to occur. Something which would appear to suit the use of Social Media and particularly blogs very well. In this respect learning, will become a far more reciprocal activity from which both HE teachers and students can benefit (Vygotsky, 1978). This is a form of learning which can be considered to be undertaken well using blogs (Noel, 2015).

In comparison to more traditional theories of teaching and learning this represents a significant departure and it may be argued in instructional theories that the shifting role of the HE teacher is unnecessary. Research has shown that instructional teaching and passive learning is more likely to result in lower levels of understanding amongst students than more active learning approaches (Watson, 2001).

Whilst Vygotsky’s (1962) social learning theory provides the basis upon which social learning may occur and places social interaction at the heart of learning it is also critical to consider the manner in which social learning theorists consider that communities may also provide a basis through which learning can occur as individuals interact, model and observes the behaviour of others and potentially form learning communities (Kumpulainen & Wray, 2002; Li et al., 2009). In order to consider this further it is imperative to consider the more recent work of Lave & Wenger (1991) who provides a model though which social learning may occur known as Situated Learning theory and Communities of Practice.

2.2.4 Situated Learning and Communities of Practice

The concept of Communities of Practice (CoP) can be seen to draw its roots from constructivism (Johnson, 2001) and has been used in the education and business sectors for some time (Li et al., 2009). This was developed alongside the theory developed by Lave and Wenger (1991) known as Situated Learning and draws from the work of Vygotsky (1962; 1978) and social cognitive theory whereby learning is
considered to be essentially a social event which reflects the nature of people as social beings who are capable of knowing (Wenger, 1998a). It also however moves away from the social theories previously discussed here as it considers a broader background of learning (Barton & Tusting, 2005; Thorpe, 2002).

The Situated Learning paradigm created by Lave & Wenger (1991) focuses on the need to provide quality opportunities for social engagement in order to gain opportunities for meaningful learning environments to form (McCormick & Paechter, 1999). As an extension of this, Wenger (1998b) developed the Situated Learning theory by defining the concept of CoP as the fundamental manner in which learning will be able to occur in a social manner (Barton & Tusting, 2005). From a CoP viewpoint, learning is based firmly within social co-participation and not only within the minds of individuals on their own (McCormick & Paechter, 1999). In fact, CoP’s consider that the traditional theories of learning, that consider learning to only occur within the mind of an individual to be incorrect. In reality in this paradigm learning is a social process and is reliant upon the act of an individual’s participation within a community in order to gain understanding (Kimble, Hildreth & Bourdon, 2008). CoPs aim to provide an explanation of the manner in which social learning systems can be formed as a type of social “container” of learning (Wenger, 2000).

Through such systems learning can take place as ‘learning is an inherent part of an individual’s participation in the community; learning is viewed as the engine of practice and practice is the history of that learning. Members develop tacit or implicit knowledge that cannot necessarily be catalogued, bulleted, or identified in procedures manuals. This kind of learning or knowledge gives members an understanding of practice’ (Moore, 2008).

However, it is essential to note that CoPs are not just networks of linked individuals or relationships and are rather communities of learners (Li et al., 2009). A community must be based around “something” and through this have an identity. It is the manner in which the community has an identity that its members identities within the community can be formed and shared practice can lead to a reinforcement of this as well as enable collective learning (Wenger, 1998b).
The main basis of this theory of learning is therefore the concept of social participation. Wenger proposes three main elements that are necessary in order to achieve a social participatory form of learning which differentiates a CoP from any other form of group or community. These three elements are defined by Smith (2003, 2009) as:

1. The domain – The community has an identity which is defined by a shared domain of interest
2. The community – Members build relationships and are able to learn from each other through their shared interest in their domain and their joint exercise
3. The practice – members of the CoP are practitioners and develop a shared repertoire of resources: experiences, stories, tools, memories etc.

Within the context of learning using blogs each of these elements can be seen to exist. The domain can be considered to be the area of learning that is being undertaken. The community will relate to the relationships that students create within the blogs between each other (although they may also already have existing offline relationships with each other also). Finally, practice will be achieved through the use of the blogs. The blogs can be collective or individual but students will be building shared resources and experiences through the use of blogs in this way.

In fact, learning within this form takes place through experiencing, belonging, doing, becoming and learning and is a balance between social interactions and personal experience. Learning therefore occurs as a relationship between individuals and the social learning environment in which they are involved enabling both personal alterations and the continuous development of the social structures of the community themselves (Wenger, 2000). Importantly in this concept learning is considered to be distributed between the various members of the community which will include those who are novices, those who are experts and those in between these definitions (Moore, 2008). Therefore, learning is not a hierarchical process of HE teacher to student. Johnson (2001) in fact considers that learning within this approach even more fundamentally affects the relationships between individuals, as control shifts from the HE teacher to the learner and therefore control, and the responsibility for learning, moves to the learner.
It is not surprising that there is also a fundamental shift within this perspective in learning which is no longer considered to be based on the transfer of knowledge from person to person but instead formed as a result of how individuals learn to become members of communities and create a shared meaning (Wenger, 2006). It is necessary to consider the manner in which a great deal of this learning will take place through the development of more tacit knowledge. Tacit knowledge which was first defined by Michael Polanyi (1958) and is based on the concept that an individual can hold knowledge even if the knowledge has not got a linguistic form and cannot be transformed into a linguistic form (Illeris, 2007). In other words, ‘we can know more than we can tell’ (Polanyi, 1966:4).

The main way in which individuals could be gaining tacit knowledge is through the learning that takes place through the observation and interact with the community and experience which is gained from this. Once again this places learning within the confines of unobservable behaviour which could result in difficulties in judging how much learning has taken place (Moore, 2008).

One aspect of CoP that is perhaps more observable is the process of legitimate peripheral participation (LPP). LPP is the process through which new members begin to function within a CoP. This is a process that focuses on the development of the practitioner rather than explicit knowledge forming (Moore, 2008).

LPP is a vital aspect of CoP and forms one of the most important aspects of the theory. LPP assumes that within a community, people will first of all learn at the periphery, defined by Lave and Wenger (1991) as "legitimate peripheral participation". As members become more competent they will however move more to the centre of the community into what Lave and Wenger consider to be full participation. This concept can be shown to apply to HE teaching and learning as new students may initially start learning by “lurking” on the sides of the community which may also be comprised of graduates and academic staff until they themselves gradually become full participants of the community (Silva, Goel & Mousavidin, 2008).
This therefore provides a manner in which to consider the relationships between the newer and older members and also the identities formed, artefacts created and activities undertaken (Lave & Wenger, 1991). LPP also allows new members to make errors and commit violations at the edges of the community as part of the learning process which should not result in exclusion from the community (Moore, 2008). However, if a newcomer is not welcomed into the community or even worse, is rejected by the community that individual will find learning at best difficult and at worst impossible. This can potentially be problematic when considering the use of CoPs as a teaching and learning tool as it suggests there may be limitations concerning the integration of newcomers and those who are working at the very margins of the community (Thorpe, 2002).

It is important to be aware when discussing CoPs in relation to HE teaching and learning that this concept was developed in the context of work based learning and professional communities and therefore it may not be entirely applicable to HE teaching and learning communities.

One example of the difference between HE teaching and learning communities and work based communities can be seen through the processes of LPP. Within a work based community it is likely that a community’s membership may change and evolve over time. This is not an issue however as it the community itself that is important and the community can still exist and even will develop as it matures creating a sense of its own cultural, language and form of communication that is separate from any individual (Li et al., 2009). Within an HE context it is more likely that the community will form and grow together as a course is undertaken before separating to some degree, if not at all, once the course ends.

It is important to note however that whilst CoPs are generally considered to be informal structures that develop on their own terms it is also possible that not all CoPs are formed naturally and a CoP is created it may need to be carefully managed and developed. ‘Their development ultimately depends on internal leadership. Certainly, in order to legitimize the community as a place for sharing and creating knowledge, recognised experts need to be involved in some way, even if they don’t do much of the work’ (Wenger, 1998b). In this respect when a community
is created for teaching and learning the HE teacher may be required to be repositioned as a “facilitator” or “moderator”. This role this may change as the community evolves, but this role is in contrast with the traditional role of imparting knowledge directly (Johnson, 2001; Li et al., 2009; Wenger, 1998a).

It is vital within any successful CoP that people wish to belong to the CoP and remain as members due to the fact that they have something to gain, and give to the community even though the community may not produce a physical product or service. In the case of a teaching and learning CoP the focus is on learning, the learning process and the practice of the community (Moore, 2008). In the case of HE communities this may be an issue as students will typically lose touch with the community once they leave the HE institution. There are ways in which involvement can be maintained such as through the use of alumni groups and inviting previous students to mentor new students within a course (Pfeifer, 2002).

Within a CoP it is vital for learning to be promoted if a CoP is to be used as a more formal way in which learning can occur. Learning in this respect focuses on specific elements of the community and can be one way in which to promote this such as enabling interactions, building a community, culture, etc. (Li et al., 2009).

The development of CoPs has therefore allowed educators to think differently about the groups, networks and associations in which they and their students are involved (Smith, 2003, 2009). They have provided alternate ways of thinking about learning that reject the behaviourist traditional approaches to learning which Wenger believes leads to disengagement with learning. Learning in the behaviourist traditions are considered to be viewed by students as irrelevant, boring, and arduous and something that most students are not suited to. This is particularly the case for the Web Generation who are considered to work in different ways to previous generations (Tapscott, 2009; Prensky, 2010; Rosen, 2010; Rosen et al., 2013). The CoP allows a move away from instructional models of learning to concentrate on models which favour the social and cultural forms of learning within each context (Barton & Tusting, 2005). However, whilst social learning theories propose that a different form of learning could be used to better engage today’s students, it does not
resolve the issues of the importance of technology for the Web Generation and which equally affect the way in which the Web Generation work, learn and socialise.

There are also further limitations to the theories according to some commentators. Thorpe (2002) for example considers that CoPs fail to explain how participation occurs around the real margins of the community and more specifically how new comers are integrated. This is also considered by Li et al (2009) to be of importance as they consider that there are potential issues of integration for newcomers where tight bonds pre-exist between members and can cause the community to become exclusive. He considers that this represents a significant barrier to use. This is not something that is considered to be an issue for all commentators however as LLP appears to suggest the manner in which new members can be integrated into the community (Wenger, 1998b). Additionally, in the case of teaching and learning within HE groups are not usually expected to have been in existence for a very long period of time and blogs will often be created only for the activity being undertaken at the time.

Further criticisms of CoP have highlighted the manner in which the theory of CoP ignores issues or trust, power, pre-dispositions of individuals and the size and reach of the community (Silva, Goel & Mousavidin, 2008). Within a teaching and learning context when blogs are used this is unlikely to be an issue due to the nature of the activity for which blogs will be used. This is due to the fact that communities are likely to be formed from students who have existing relationships with each other. It is also likely that within a teaching and learning setting that communities will have a relatively short reach and will not be very large.

Overall it is clear that CoPs could hold many potential benefits for the changing nature of education and students and for the use of blogs within teaching and learning.
2.2.5 What does this mean for Teaching and Learning?

From the learning theories discussed above it should be clear that there has been a significant shift in the manner in which teaching and learning theories have developed within the last century. It would also appear that these approaches would well suit the social and collaborative working nature of the Web Generation. However, the theories considered above have, in the main, been developed before the technological opportunities which the Web Generation today take for granted were available.

Therefore it is important to note that whilst technologies may play a vital role in education and the lives of students today, it is still widely believed amongst educators that the technology aspect within information learning technologies should be subservient to the learning aspect and remain as a tool for usage and a medium for delivering the message not form the message itself (De Villiers, 2007).

In relation to the above learning theories, there appears to be a lack of technological components to them. The importance of them for the Web Generation appears to have been noted by a number of commentators who suggest that there is clear evidence to suggest that the social and collaborative opportunities made possible through the internet and more specifically Web 2.0 may further promote and enhance the concepts of greater constructivist learning, a rejection of technology entirely and a call for the status quo to remain.

Marc Prensky (2010) suggests that a form of “Partnering” may best meet the needs of both students and HE teachers in the future. This would take the form of an equal partnership between students and HE teachers in which HE teachers do not necessarily need to know how to use technology but instead need to know how technology can be used for teaching and learning. In this form ‘using technology is the students’ job. The HE teachers’ job is to coach and guide students in the use of technology for effective learning. To do this, HE teachers need to focus on, and become even more expert at, things that are already part of their job, including asking good questions, providing context, ensuring rigour, and evaluating the quality of the students’ work (Prensky, 2010).
Kamberi (2015) for example considers that the development of social media and different forms of technology that teachers across the world are now trying to seek out new effective and innovative ways of incorporating technology into their classroom.

For Wittgenstein (1997) the use of technology to connect students with each other in a social manner would be a very appropriate use of technology when considering the theories of social learning, as proposed by Bandura (1977), Vygotsky (1962; 1978) and others and could include:

- Telecommunications tools such as email and the Internet providing a means for dialogue, discussion, and debate – interactivity that leads to the social construction of meaning. Students can talk with other students, HE teachers, and professionals in communities far from their classroom. Telecommunications tools can also provide students access to many different types of information resources that help them understand both their culture and the culture of others.
- Networked writing programs provide a unique platform for collaborative writing. Students can write for real audiences who respond instantly and who participate in a collaborative writing activity.
- Simulations can make learning meaningful by situating something to be learned in the context of a “real world” activity such as running a nuclear power plant.

Wittgenstein (1997) is demonstrated through these examples some of the early ways in which the potential of Internet based technologies was being considered to be able to allow students to undertake greater degrees of social learning and were also enabling students to undertaken simulated learning activities.

Once the Internet had evolved further Prensky (2010) considered that HE teachers should point out to students all technologies that are available, watch carefully as students use the technologies to be sure that students are producing high-quality, rigorous work, encourage, or even require, students to make use of as many
different technologies as possible over the course of a semester or school year and point out potential pitfalls and mistakes that are often made by students when using technology, and help students become better at critically assessing the tools they use. By proposing such a role for teachers Prensky (2010) has demonstrated the importance of students being able to gain as much experience of using Web based tools as possible. He also considers that this is something which can should promoted by academic staff.

Additionally in relation to CoP, Lave and Wenger (1991) consider that technology can greatly assist in the promotion of social learning and that technology such as Web 2.0 tools can enable a transformation of the manner in which communication occurs and knowledge is transferred. (Lave & Wenger, 1991).

This is also supported by Kimble, Hildreth & Bourdon (2008) who state that the advent of new technologies has had a significant effect on CoPs and has allowed CoPs to move from local environments to a more global scale. This further supports the need for teaching staff to consider the opportunities that these technologies may provide in further enhancing the teaching and learning environment, as whilst it is clear that the Web Generation may prefer this way of working, it would still not necessarily be the preference for teaching staff (Garcia et al, 2013).

Although this may be the case, however, the fundamental principles of social learning theories as encouraging learners to take responsibility for their own learning (Thorpe, 2002) is likely to lead to an increase in the use of Web 2.0 technologies as students gain greater autonomy in the manner in which they work. Students may also choose to work collaboratively with peers and others and utilise these tools as a natural way of working.

This is also likely to lead to a change in the nature of the teaching and learning landscape as it contests that learning occurs only through transmission from the HE teacher to students (Thorpe, 2002). In this respect therefore it may be possible that learning within a social learning context may also happen outside of the traditional class room setting and allows learning to take part in a variety of locations, settings and groups (Barton & Tusting, 2005) which may include online environments.
Overall the move away from the more didactic teaching methods of the more traditional behavioural and instructional models to one of more social constructivist learning should provide greater opportunities for the use of new technologies such as Social Media tools and particularly blogs which ultimately may better meet the needs of the Web Generation. Nevertheless, it is important to note that often the decision of whether to use these tools for teaching and learning at this time still lies with the HE teacher rather than the students who currently have more limited options for example whether to attend classes or not or work hard or not (Laurillard, 2002).

It is reported that some academic staff are unwilling to use technology within education (Ottenbreit-Leftwich et al, 2014). Seaman and Tinti-Kane (2013) report that 59% of academic staff do not use Social Media within their teaching and learning and 56% of academic staff consider online and mobile technologies to be more distracting than helpful in a teaching context. When academic staff do use technology, it is suggested that this will usually be in the form of older internet tools such as email rather than newer Web 2.0 tools such as chat rooms, discussion boards or instant messaging as these are the technologies that are the least scary and likely to go wrong for us (Reich & Daccord, 2008). Although this research was conducted some time ago and it would appear may need further study.

The lack of the use of technology could potentially be due to the nature of academic staff as digital immigrants (as discussed previously) as this cannot be attributed to a particularly pedagogy or learning approach. This can be seen due to the manner in which the majority of e-learning is currently developed from more traditional behaviourist and instructionalist approaches and results in the replication of offline materials online. Constructivist approaches meanwhile which are assumed to engage learners in a greater level of knowledge construction and mean-making, are evident in only in some cases, not all (Karasavvidis, 2010).

Within this section, the changes within teaching and learning within recent years has been explored. This section has also shown how this may have implications for the Web Generation and the use of technology within education. In order to gain a better understanding of the manner in which technology is currently being utilised
within education the extent to which technology is currently used within educational contexts alongside and the extent to which Social Media and particularly blogs are being used to further support the needs of the Web Generation will next be discussed.

2.3 Existing Technology Usage within Higher Education

During the last decade, there has been a significant increase in the use of technology within Higher Education, not just in the nature of courses available such as IT and computer science but also in the delivery of more general education (Herold, 2016).

Perhaps the largest area of development within the last few years has been that of Blended Learning which is defined as ‘a holistic approach to learning that involves a blend of different approaches e.g. face to face and e-learning, the use of different technology-based tools, or the blending of classroom-based and work-based learning’ (Allan, 2007). It is this form of technology usage that will be considered in this study. This differs from distance online learning in which all learning occurs online usually due to students being geographically disparate (Moore et al., 2011).

Whilst blended learning appears to be the main area of development within teaching and learning within Higher Education, the main e-learning aspect of this has been in the form of the Virtual Learning Environment (VLE), also sometimes known as the Managed Learning Environment (MLE) or the Learning Management System (LMS). VLE’s reportedly exist in the majority of HE organisations (Weller, Pegler & Mason, 2005) and are defined as: ‘A collection of integrated tools enabling the management of online learning, providing a delivery mechanism, student tracking, assessment and access to resources. These integrated tools may be one product (e.g. BlackBoard, WebCT, Sharepoint, Canvas, Moodle) or an integrated set of individual, perhaps open-source, tools’ (JISC Infonet, 2009).

Overall it appears that to date the main tools, although not the only tools, included within most VLEs are related to facilitating or enhancing existing off-line teaching and
learning rather than developing new pedagogies or student interactions (Allan, 2007; Gillespie, 2007; Jones, 2002). JISC (2009) in fact considers that this is a necessary step in the first stage of developing e-learning systems and at this initial point many HE teachers will use VLEs to provide an online version of their offline learning activities and therefore to “webify” their face-to-face teaching activities. The problem here is that this represents a very limited approach to using the capabilities of the VLE and does not encourage real thought about the underlying pedagogical approaches being utilised and how these could be exploited using the VLE (JISC, 2009). For some teachers, this will be the first point of development of technology within their classroom however for others this may be the only way in which technology is utilised.

This view is further supported by Richardson (2010) who considers that the majority of academic staff have simply recreated the work that they previously would have had in paper form online and again the issue in this case is that the opportunity to use technology as a powerful teaching tool is therefore being missed (Barnes, Marateo & Ferris, 2007).

Beetham and Sharpe (2007) perhaps best summarises this view by indicating that where the VLE is used for teaching and learning, it is generally in the form of the development of the presentation of lecture materials, providing access to resources electronically via the internet and providing greater degrees of flexibility in study, none of which Beetham and Sharpe consider to be “transformational” opportunities that new technologies could be providing.

However it should be noted that Mayes and De Freitas (2007) state that e-learning has placed a greater emphasis on pedagogy that encourages learning through relationships and thereby improved teaching and learning practice. This view is also shared by Jones (2004) who stresses the importance of connecting between learners and tutors and between the learners and the resources they may want to make use of during their studies which can be enhanced through online teaching and learning tools.
As a result of the approaches described above it would appear that many current teachers do not consider technology within their teaching to be “transformational” but instead consider them to be supplementary to their course (Caruso & Kvavik, 2005). It is important to remember that this does not imply that all HE teachers are using technology within a passive way but does suggest that the majority may be. This therefore means that it is likely that students will also be viewing the use of technology in the same way as their experience is being directed by the HE teacher.

Mayes and Fowler (2006) consider that this represents only the first level of learning that can take place online and suggest a three levelled model which is shown below.

1. Primary courseware is used to support online lecture notes, reading lists, etc.
2. Secondary courseware supports students in performing a task e.g. computer assisted assessments
3. Tertiary courseware there is a two-way dialogue i.e. online discussions, videoconferencing, shared workspaces

According to this model, high level learning will only take place within the third level, and students may not currently be receiving the true benefits of e-learning due to the lack of two-way dialogue occurring with their HE teachers or other students online. This view is further supported by Baker & Grossman (2013) who note that the ability to support more collaborative experience and active learning is one of the most valuable aspects of the VLE although this is not occurring in the majority of classrooms and lecture halls.

The reasons for this may be multiple and are complex and can include factors such as threats of fewer jobs, concerns about lower use of full time staff, concerns of lower quality, the time required to create resources, lack of training, lack of university support, lack of peer support (Maguire, 2005) and concerns about losing the advantage of holding unique knowledge (Lai & Chen, 2011). Whilst not all HE teachers may perceive the use of technology in this way it is considered that a number do and this prevents the embracing of such technology.
Perhaps it is important within this context to come back to Prensky’s (2001b, 2012) definition of older generations as digital immigrants as this will substantially affect the willingness of HE teachers to use technology within education. Prensky argues that this divide results in a lack of understanding between HE teachers and students as the two generations can be considered to speak different technological and social languages creating two discrete groups, HE teachers that are of a “pre-digital age” and students who speak an entirely new language (Prensky, 2001b).

This is supported by the view that a number of academic staff appear to be concerned that traditional, and therefore familiar, teaching methods may be phased out (Reece & Walker, 2016) as a result of the adoption of virtual learning tools. Some teachers may also inherently consider that virtual learning is of lesser value that traditional methods of teaching. Reece & Walker (2016) consider that this is often due to concerns about the loss of control teachers feel they will experience if teaching methods change. Some staff may not be able to see the value in the use of emerging technologies for teaching and learning and may consider that such technologies are not suitable for educational use within formal educational courses (Seaman & Tinti-Kane, 2016).

Some academic staff additionally see e-learning, and the use of technology within education, as an add-on to both the educational experience and the reasons for which the technology is developed in the first place. An example of the latter can be seen in the development of webcams which have not been developed specifically with educational use in mind but which have now been embraced by some educators and has found a place for usage within education (Holmes & Gardner, 2006).

Alternatively, rejection of technology could simply be due to the pedagogical perspective adopted by academic staff or due to possible technical skills issues that may result in resistance to the use of technology. This may particularly be the case where technology the student has more skills than the HE teacher and which may therefore represent a threat to the HE teacher’s knowledge.

Additionally in some cases academic staff who are interested and involved with new technologies are often suspected by other academic staff to use these technologies
whether they are pedagogically appropriate or not (Beetham & Sharpe, 2007). This can have a detrimental effect on the usage of e-learning as it makes academic staff less likely to want to become involved in new initiatives involving e-learning. Even where staff are excited about new technologies and have the infrastructure, and support is strong, the lack of staff support can result in the lack of development of anything beyond pilot schemes (Salmon, 2004).

There is also a concern that perhaps academic staff are being pushed too much into adopting e-learning and that this is causing academic staff to reject e-learning before attempting usage and is leading to reluctance for use (Rees & Hopkins, 2010). Robin Mason of the UK Open University’s Institute of Educational Technology for example states that ‘in my view, too much is made of training tutors and this makes online tutoring seem more difficult and more unknown than it really is’ (Ball et al., 2009).

Staff reluctance to use technologies are also considered to be due in part to the “transient” nature of new technologies. This results in the high value of investment needed in emerging technologies being considered to be too high, as new technologies can be considered by some staff to be simply “fads” and not worth investment (Margaryan & Littlejohn, 2008).

However, it can also be considered that it is the nature of higher education itself that makes change a slow process (Sims, 2014). Within HE it is not easy to make changes quickly due to the values, traditions and infrastructures of institutions which create an ideal climate for “natural inertia” (Laurillard, 2002).

This idea of natural inertia can also be said to exist amongst students as not all commentators are assured that students are prepared to use new technologies to learn, and believe they would prefer to continue to use existing off-line systems to learn (Quintero, 2007).

Laurillard (2002) goes as far as to suggest that the tools that are used in e-learning were only ever designed to provide the solution to a problem of logistics and not a pedagogical issue. In this way, she therefore considers that the tools of e-learning
were only ever designed and intended for use by students who were geographically distant and unable to get to the classroom.

Salmon (2004) suggests that students disengagement may be due to the lack of the completion of a five stage model which must be undertaken. This model is suggested as a means for achieving e-moderation but can also be seen as impacting on the effectiveness of e-learning:

Stage 1 – access and motivation – ensure students can easily gain access
Stage 2 – online socialisation – become comfortable in environment
Stage 3 – information exchange – fast and furious exchange of messages - interaction
Stage 4 – knowledge construction – building online community focussed on learning
Stage 5 – Development – online learners are taking responsibility for their own learning.

As a pre-requisite for each stage, all former stages must have occurred and therefore it may be possible that students are currently not able to fully engage in the possibilities of e-learning due to, for example, the lack of e-moderating by teaching staff.

The benefits of the use of VLE’s such as the positive engagement students have with technology, the nature of technology as flexible yet structured, distance learning, the concept of “anytime, anywhere, any place” and the scalability of such systems (Ball et al., 2009) are all apparent but it is questionable whether, as yet, students and HE teachers have had sufficient opportunities to use technology in new and innovative ways in order to assess whether it would be beneficial as a teaching and learning tool. Akin to the majority of modern organisations, educational institutions are currently undertaking a relatively slow process of adopting and adapting to new technologies and the benefits that these technologies may give them. This is particularly noticeable given the speed with which these new tools are now being developed (Beetham & Sharpe, 2007).
Whilst the VLE can be seen to be a major step forward for educational institutions it does not appear that all HE teachers are taking advantage of the technological developments that are now available through Web 2.0 and Social Media tools and which allow discussion to continue outside of the classroom and enable students to collaborate and communicate in innovative and different ways (Bryant, 2006).

Dalsgaard (2008) considers that the large scale adoption of Web 2.0 and Social Media tools will represent a fundamental change for the educational use of technology which has previously only focused in supporting tightly knitted groups. The author does note however that the advent of Web 2.0 tools changes the focus of learning technologies towards more loosely organised groups which more closely relate to networking and collaborative activities. One way in which that has been seen to occur is through the introduction of Massive Open Online Courses (MOOCs) which have a large number of geographically dispersed students to come together and study for free using the Internet (Rouse, 2013). MOOCs represent just one way in which the Internet has allowed education to be offered using non-traditional forms.

It is against this background important to consider the role that Web 2.0 tools could potentially play in the future of education, and more specifically of technology within education. It would appear that to date the tools which students are choosing to engage with within their daily lives are not being fully exploited within education by all HE teachers and students. It is reported by Perrin (2015) that over 90% of young people (18-29 years old) use social media. E-learning and many educators are currently therefore to some extent playing “catch up” in order to try to include technologies with which students may already be very familiar, within their education (Hunter, 2007). Kamberi (2015) considers that teachers are now trying to capitalise on the Social Media trend by using Web 2.0 technologies in order to make learning easier for students, promoting student autonomy and by modernising the educational experience. The nature of Web 2.0 tools and Social Media such as blogs shall therefore be considered in more detail in the next Section.
2.4 Web 2.0: Social Media

Web 2.0 tools first emerged in the early 21st Century enabling internet users, for the first time, to interact with, modify and create content on the web for themselves both easily and cheaply and providing opportunities to harness collective intelligence (O'Reilly & Battelle, 2009). This has significantly altered the way in which not only the internet is used but also how we communicate, work and socialise with our friends and acquaintances (Jabbari et al, 2015) Web 2.0 allows users to participate rather than just publish (Dalsgaard, 2008; Karasavvidis, 2010; Mason & Rennie, 2008; Lee & Bonk, 2016). Greenwood, Perrin & Duggan (2016) reported that 62% of Americans indicate that the get their news via social media. In 2016, there are also reported to be 2.22 billion social media users across the world (Statista, 2016).

Richardson (2010) identifies ten “big shifts” that are considered to be occurring in terms of Web 2.0 and which will make a difference to the manner in which we use the internet and other off-line and on-line tools:

1. Open Content
2. Many, Many HE Teachers and 24/7 Learning
3. The Social, Collaborative Construction of Meaningful Knowledge
4. Teaching is Conversation, Not Lecture
5. Know “Where” Learning
6. Readers Are No Longer Just Readers
7. The Web as Notebook (or Portfolio)
8. Writing is No Longer Limited to Text
9. Mastery Is the Product, Not the Test
10. Contribution, Not Completion, as the Ultimate Goal

These trends are important to consider as these shifts will allow academic staff to consider new ways in which to teach. It will also provide students a number of different ways in which to learn. It would appear that a number of the trends Richardson identified in 2010 have begun to occur. For example, the use of blogs and other social media have demonstrated the use of the web as a notebook or
portfolio (Kamberi, 2015). We have also begun to see that readers are no longer just readers but can now be contributors also (Noel, 2015).

Whilst Web 2.0 has provided a wide plethora of tools for use with the internet it is social media that has emerged as the key component of the Web 2.0 movement (Alexander, 2009) and which has clearly today become integrated into many people’s lives even though the ideas that individuals would voluntarily share details of their lives and private contacts around the world even as little as ten years ago was unthinkable (Middleton, 2009).

Social media tools can be defined as a group of web projects and services which are perceived as especially connective and include tools such as: wikis, blogs, podcasting, social networking sites, social bookmarks and video blogs (Alexander, 2009).

It is important to note additionally that Social Media tools have largely been successful with those individuals who can be considered to be members of the Web Generation. These individuals are now considered to some extent, live their lives online (Richardson, 2010). Whilst Social Media tools have been popular amongst the Web Generation their usage in relation to education has not been seen to have developed to the same extent as within their personal lives (Jabbari et al, 2015) even though Social Media and Web 2.0 tools could allow increasingly innovative practices to emerge within education. Enabling students to be better supported and making use of the range of the benefits of Web 2.0 tools such as discussion and the sharing of ideas would appear to support educational use well (Kamberi, 2015). The availability of these benefits has not however resulted in the creation of a broad educational community using such technologies (Conole, 2010).

Sherman (2009) considers that Social Media tools can be highly applicable to education and will allow interaction to occur socially amongst a wide range of participants including for example; HE teachers, students, other experts, peers colleagues and mentors. In addition, Social Media software will also allow learners to access a greater number of different people, including experts, on a wide range of
topics, experts who can potentially provide an extensive range of knowledge and information to the learner (Sherman, 2009).

Sherman (2009) in fact provides some examples of how Social Media software could be used in order to enhance education:

- Multiple online Q&A sessions hosted by different experts
- Twitter conversations with subject matter experts
- Real-time conversations with subject matter experts
- Real-time keyword searches of expert blogs
- Shared-world digital simulation training

Ellison (2008) further adds advantages to the use of Social Media tools as including:

- Students are able to meet and stay in touch regardless of geography
- New students can be engaged with project work and other students before the start of term
- Students are challenged to think about how to present work on the web
- Allows students to share ideas and freely debate
- Provide space to advertise events and exhibitions
- Existing students are able to offer advice and provide information

One of the most interesting Web 2.0 tools to have been developed in the last few years are blogs. A blog is based on the premise that an individual can build both an individual web “presence” and create links which are visible with others who also have a presence on the web (SupportBlogging, 2011).

Whilst blogging is not the most recent of the newly introduced Social Media tools (Livingston, 2011) it can be considered to be a tool which has fundamentally changed the manner in which individuals are able to interact with others (Guadagno, Okdie & Eno, 2008; Harrison, 2014). It is also considered to be unique and different from other web tools, such as wikis, discussion boards, and holds a socially-transformative and democratizing potential when used appropriately (Herring et al., 2004).
When comparing blogs, wikis and discussion boards there are a number of differences that can be seen. For example, whilst a blog is usually centred around the author or authors discussion boards will centre around topics and wikis will centre around content or documents (The University of Adelaide, 2014). Additionally, it is generally the case that blogs are primarily used to reflect and review whilst discussion boards are used to discuss and debate and wikis are used to collaborate and synthesise (The University of Adelaide, 2014). It is important to be aware however that these definitions only highlight the key features of each of these tools and do not outline all of the activities that can be undertaken using these tools.

Although as a tool for teaching and learning blogging has been somewhat slow to gain momentum however it is increasingly being shown to be a beneficial teaching and learning tool (Livingston, 2011). For example the manner in which blogs can allow both innovative knowledge sharing (Lai & Chen, 2011; Gregson et al, 2015) and promote social interaction (Deng & Yuen, 2011) has been noted to represent a benefit when compared to traditional learning tools (Deng & Yuen, 2011). In comparison to blogs for example wikis do not provide the opportunities to communicate and undertake debate and discussion boards do not provide opportunities to develop a social presence to as large a degree as a blog (Farmer, 2006). It is also noted that no other current internet technology provides this ability.

Blogs also enable individuals to easily and flexibly publish online content. Whilst this is common amongst many Web 2.0 tools, it is the manner in which blogs allow users also to communicate, interact, share knowledge and build communities that makes blogs fairly unique within the plethora of Web 2.0 tools available. Blogs also have a unique structure in the manner in which they are decentralised, distributed and yet are interrelated and have in built response mechanisms (Bruns & Jacobs, 2006). The use of blogs has become far more common place in recent years but nevertheless still remains a relatively underutilised tool for teaching and learning in Higher Education (Patrut & Patrut, 2013) In order to understand how blogs could be used in education therefore it is first necessary to consider their use in more general terms and this shall now therefore be considered in more detail.
2.4.1 The use of Blogs

Weblogs or blogs as they are more commonly known are considered to be one of the first widely adopted and available tools of Web 2.0 and Social Media and are generally accepted to be an influential medium across all areas of our daily lives (Richardson, 2010). One reason for this is that blogs have been consistently used and are considered to create interesting dynamics that are not present in other types of Social Media (Gumbrecht, 2004). There is also evidence that social structures are continuing to be built around the blogosphere (Efimova & Hendrick, 2005). The blogosphere is defined by the Cambridge Dictionary (2017) as “all the blogs on the internet, and the people who write or read them’ (Cambridge Dictionary, 2017) and is something which is considered will continues to expand where some other Web 2.0 or Social Media tools have already fallen into disuse (Williams & Jacobs, 2004).

The term blog is defined as ‘a regularly updated website or web page, typically one run by an individual or small group, that is written in an informal or conversational style.’ (Oxford Dictionaries, 2017) This is perhaps best expanded by Stone (2004, p.35) who considers that ‘a blog is a collection of digital content that, when examined over a period of time, exposes the intellectual soul of its author or authors. Blogging is the act of creating, composing, and publishing this content; and a blogger is the person behind the curtain.’ Whilst this definition is an older one the basic function of a blog still relates well to this definition.

It is important to note from both of these definitions that a blog is clearly not defined by its content but rather by its format and process (Downes, 2004) and in this way a blog can really be considered to be a framework through which experiences are shared (Hourihan, 2002). The manner in which blogs also allow impression management and the creation of an online identity (Fullwood, Sheehan & Nicholls, 2009) also results in blogs being considered to be as unique and individual as the bloggers who are creating them (Pikas, 2005). Even the format of a blog can be flexible allowing a variety of styles, colours, etc. (Singer, 2009) Within all blogs however there are considered to be opportunities for communication and collaboration with others online (Karasavvidis, 2010; Lujan-Mora & Juana-Espinosa, 2007; Richardson, 2010; Neira-Pineiro, 2015). Blogs also have an ability to be
creative and self-expressive (Lujan-Mora & Juana-Espinosa, 2007). It is this flexibility that results in the versatility of blogs for a range of uses and for a range of topics in forms which are both individual and collective (Williams & Jacobs, 2004; Neira-Pineiro, 2015).

A further benefit noted of blogs is the way in which they are relatively simple to use, most often allowing “one click” publishing of a full range of media through a range of platforms, including tablets and mobile phones and requiring no special software aside from a web browser. This makes blogs both relatively easy to use and user friendly (Bryant, 2006; Deng & Yuen, 2011; Ferriter, 2009; Lujan-Mora & Juana-Espinosa, 2007; OnlineEduBlog, 2009; Pikas, 2005; Richardson, 2010; Stone, 2004). Additionally blogs are essentially any time, any place allowing a flexibility of use (Flatley, 2005; Lai & Chen, 2011; Livingston, 2011; Lujan-Mora & Juana-Espinosa, 2007; Naish, 2005; Richardson, 2010; Stone, 2004; Jabbari et al, 2015).

It is imperative to note also that blogs are asynchronous in nature and consequently neither contemporal nor simultaneous (Gumbrecht, 2004). This has the benefit of not only allowing communication to happen non-linearly (Instone, 2005; Naish, 2005) but also allows communication to occur easily with individuals within differing time zones (Brescia & Miller, 2006). This allows individuals to connect with many other people whether “down the hall” or on the other side of the world (Guadagno, Okdie & Eno, 2008; Noel, 2015). With blogs therefore the nature of social interaction changes and the exchange of ideas, perspectives and collaboration to form new knowledge is enabled in a range of ways (Efimova & De Moor, 2005, Noel, 2015). This is a unique characteristic of blogs within Social Media and represents a significant allure for some blog users as not only can blogs foster a much more relevant continuity of conversation than ever before possible (Macduff, 2009) but they also allow individuals a choice of whether to respond to a post or comment or not. This provides time for an individual to reflect on comments or posts before commenting if they wish (Garrison, Anderson & Archer, 2000). Additionally blogs allow writers to write as much or as little as they wish without interruption particularly interruption to the flow of their storytelling (Gumbrecht, 2004).
It is important to note that not all commentators agree that asynchronous communication is beneficial, with some considering that the nature of blogs as asynchronous may in fact act as a barrier to use. This is due to the fact that it is not suited to immediate replies, personal communication, conversation or an immediacy that can be seen in other online tools (Andergassen et al., 2009; OnlineEduBlog, 2009). Others conversely believe that blogs still allow for fast and relatively short responses (Efimova & De Moor, 2005; Macduff, 2009). In addition whilst blogs are asynchronous the technology driving them has a unique ability to provide a very quick diffusion of information through the internet through the use of RSS feeds, XML feeds and API interfaces which further expand the number of points at which audiences can interact and be communicated with (Bryant, 2006; Ferriter, 2009; Pikas, 2005; Rettberg, 2008; Richardson, 2010; Singer, 2009; Kamberi, 2015).

In reality the technology, especially when a hosted blog is used, has both features that allow templates to be chosen and allow the customisation of a blog without detailed knowledge of HTML or XML (Pikas, 2005) and the technology to provide full visitor analytics (Singer, 2009). This provides a degree of “stickiness” to the site and encourages users to repeatedly return to the site to check whether any new information has been posted or if new readers have visited the site. Two of the most essential ways in which blogs are additionally made relatively sticky is through comments, which allow bloggers to solicit the views of their readers and readers are able to make their views of the blogging posts known (Blood, 2002), and trackback, which allows information to be traced back to the initial source and to see who has been linking to blog posts (Miura & Yamashita, 2007; Tremayne, 2007). It is important to note though that this does not assure that information is not biased or reliable (Kaye, 2007).

It is in reality the manner in which blogs promote a new type of socialization (Hsu & Lin, 2008) and the development of conversational practices (Efimova & Hendrick, 2005; Hourihan, 2002) amongst blog users and thereby develop communities that is considered to be one of the greatest benefits of blogging and it is this which makes blogging a key Social Media tool (Mansouri & Piki, 2016). Schmidt (2007) in fact considers that blogging communities can be considered CoP although for the majority of commentators this is not explicitly stated. It is instead the blogs ability to
offer interaction to the community’s members (Ferdig & Trammell, 2004; Williams & Jacobs, 2004) and give a clear indication to a blog owner that others are interested in what they have to say, and through this gain acceptance from others, that is of most importance (Deng & Yuen, 2011; Miura & Yamashita, 2007). It can be considered also that it is through interaction that communities based around shared interests are able to be identified and formed (Schmidt, 2007; Jackling et al, 2014) and this interaction and collaboration that allows social and peer communities to be promoted and to support learning (Glogoff, 2005).

However, blogs do also face criticism from some authors. For example it is noted that as blogs are asynchronous they do not allow the audience to see verbal or non-verbal cues (Gumbrecht, 2004; Poldoja et al, 2016). The absence of verbal and non-verbal cues blogs are considered to create risks of miscommunication and misunderstanding within a community (Macduff, 2009). This will be particularly the case if participants have not previously met or worked together (Garrison, Anderson & Archer, 2000). Negative impressions can also be formed if students experience interaction in which they perceive others to have too authoritative tones, mistrust exists, too much competition exists, there are threats to privacy or some students feel excluded from the community (Top, 2011). This could lead to the creation of further problems between individuals or groups within a community and a negative impression of blogging as a practice overall, particularly as most often people’s perception of blogging will be formed as they participate within a blog (Hsu & Lin, 2008).

The manner in which individuals perception of blogging will be formed as they participate will be affected by what Efimova & De Moor (2005) have identified as the socio-technical context. This is comprised of the rhythm (the level of activity over time), the media choices (the type of post, comments or other media choices) and linking practices (the manner in which blogs are interlinked) and will represent the manner in which the community operates and therefore how interaction will occur.

Rhythm is an important concept as it is rhythm that will lead to the creation of blogging posts and activity at different times (Hill, 2006). Within rhythm there are three different activities that will occur. These are writing, reading and commenting
(Den & Yuen, 2011; Lee & Bonk, 2016). Writing within a blog relates to the manner in which an author will create content for the blog. Writing may be undertaken as a group, collaborative or individual activity but should result in the creation of posts for the blog. When writing a blog post may include images, tables, links and other resources as well as text.

The second part of rhythm refers to reading (Deng & Yuen, 2011). Reading refers to the way in which individuals will read posts and comments within a blog. Reading can occur both from reading a blog owned by an author or through the process of reading the blogs of others. It is important to be aware that reading a blog may be a one-off activity by which a particular blog post has been of interest or can be when an individual regularly reads a particular blog.

The final type of activity that comprises blogging rhythm is commenting (Deng & Yuen, 2011). Commenting can be comprised of both commenting in and commenting out. Commenting in refers to the way in which a blog may receive comments from others in relation to a blog post. Commenting out in contrast refers to the manner in which an individual may choose to leave comments on the blog posts of others or respond to other comments made already in relation to blog posts.

Overall the term rhythm refers to the way in which individuals will undertake these different activities and also how often they undertake these activities (Hill, 2006; Deng & Yuen, 2011).

Within a blog interaction can be achieved in multiple ways not only by writing in an individual blog or contributing to a collective blog, but also by responding to posts via comments, reading other people’s blogs and acquiring resources. It is through these activities that a blog is expected to increase the overall number of comments received and therefore increase both its interactivity and the self-motivation for an individual to blog (Kim, 2008). It is also through the use of comments that the notion of kinship can be developed and the community can be developed allowing “bridges” to be built between individual blogging “islands” (Gumbrecht, 2004).
It is necessary to note that the potential number of individuals with which a blogger may be able to interact is very large akin, according to Williams and Jacobs (2004) to a talkback radio host. In reality the audience for a blog may be much smaller with most of the readership of blogs focusing on an extremely small proportion of the total blogs available and generally the highly successful “A-list” blogs (Du & Wagner, 2006). This can be considered to reflect the “Pareto” principle in which 80% of interaction will occur within 20% of a medium (Shirky, 2003).

Studies considering educational blogs have since conversely shown however that within the context of blogs it is the top 40% of active bloggers who have approximately 80% of the total blog entries and there are clear correlations of active blog use and active learning within the environments considered (Lin et al., 2006). This therefore would suggest that there are differences seen between the manner in which blogs are used for education as opposed to general use. In reality however the use of blogs is not entirely clear with further analysis by Shirky (2003) has shown that in fact 50% of traffic is accounted for by 12% of sites. Whilst percentages differ the principle identified is important and demonstrates that the majority of blogs will not have a high audience although they may have a dedicated and interested audience. Anderson (2006) further has defined this phenomenon as “the long tail” in which a power law determines that a small number of blogs will receive the largest number of comments (Schmidt, 2007). The long tail also however suggests that an endless choice is leading to unlimited demand (Anderson, 2010). This therefore suggests that almost everything posted online will find an audience even if it is very a small audience.

Rather than representing a static picture Du and Wagner (2006) have undertaken research which demonstrates that popularity is in a constant state of flux and those blogs at the centre of the blogging community can change. During their study 50% of blogs had positive or negative growth and 42% were within their “middle” ranking. Middle ranking blogs would move both within and outside of their top one hundred “A-List” grouping. Within this study blogs were determined to be core, falling stars, fringe, emerging, dropout and rising stars. It should be noted however that this study was conducted with a total of 126 blogs out of four million possible blogs and consequently the generalizability of the studies is questionable. The results of this
and previous studies do need to be taken within the context that according to research reported by Rettberg (2008), in order to have a successful community it is only necessary to have an audience of approximately fifteen people who are genuinely engaged with the community.

The concept of the “real audience” is particularly important as blogs may be subject to “troll infestations” where messages are sent that ‘intentionally try to cause disruption by posting messages that are inflammatory, insulting, incorrect, inaccurate, or off-topic with the intent of provoking a reaction from other’s’ (Lujan-Mora & Juana-Espinosa, 2007). Even where “troll infestations” do not occur, feedback which is inappropriate, irrelevant, non-credible or unverified may still potentially occur (Pikas, 2005; Richardson, 2010; Tremayne, 2007).

In addition to troll infestations or flaming there can also be seen a great deal of concern relating to issues of privacy, trust and security online particularly as information is often persistent and searchable for an undefined and undisclosed amount of time and potentially after it is of value to the originator (Cain, 2007; Dwyer, Hiltz & Passerini, 2007; Singer, 2009). Additionally information is often available to a range of invisible audiences (Cain, 2007). These invisible audiences can include potential employers, colleagues and friends of the future and in an educational context students may need to be aware of what they are posting online due to the future availability of this information (Bryant, 2006; Guadagno, Okdie & Eno, 2008; Richardson, 2010; Tapscott, 2009).

McConnell (2008) considers that there is in reality a large amount of “paranoia” in posting online concerning the inappropriate use of information and the dangers seen are in reality a perception rather than reality. Danger may be seen particularly by those who are not part of the Web Generation, who do not live their lives online and therefore may not be aware of the way in which Social Media tools are used within everyday lives today and may not be familiar with the nature of blogging. The reality may also be skewed by stories within the popular media or general folklore.

Gumbrecht (2004) has studied the use of blogs by different generations and defines three types of Social Media users, power creators, older creators and content
omnivores. Within this typography, power creators are the youngest group which represents the largest group of individuals with internet access and has a mean age of 25. This group participates in a range of internet based activities and represents the majority of blog users and readers. The second group, older creators tend to have the greatest amount of experience with the internet but will most often use websites rather than blogs to gain information. This group has a mean age of 58. The final group, known as content omnivores, has a mean age of 40, are online frequently and use the internet and internet tools for a range of activities and reasons. This research therefore demonstrates that it is younger people who appear to be more engaged with Social Media tools and blogs and this therefore meets with the expectations of the concept of the Web Generation. It would therefore be expected that younger people would in theory be more likely to wish to use this type of technology within their education particularly as blogs can be considered to offer opportunities for active learning, the improvement of relationships between HE teachers and students, greater higher order thinking skills (Morgan, 2012) and a greater flexibility in the manner in which teaching and learning can be delivered (Ferdig & Trammell, 2004).

Overall it can be seen that the use of blogs and their flexibility of use makes a strong case for their use within education (Naish, 2005). It is critical however that blogs used in educational contexts do not necessarily follow the same rules as personal blogs as they are usually created for a different purpose (Gumbrecht, 2004).

Gumbrecht (2004), for example, considers that using blogs as a community-building function would seem to be impossible however within an educational context the community building ability of blogs through the high value placed on comments allows the formation of a community based on dialogue. It is therefore necessary to additionally consider the manner in which blogs can be used specifically within an educational context and this shall now be considered in more detail in the next Section.
2.5 Use of Blogs for Teaching and Learning

Whilst the use of blogs has continued to grow within the last few years, the usage of these technologies for educational purposes has remained relatively limited. In addition, the results of studies with this area appear to be inconclusive and contradictory. Empirical research also appears to be relatively limited (Du & Wagner, 2005; Garrison, Anderson & Archer, 2000; Halic et al., 2010; Herring et al., 2004; Kent & McNergney, 1999; Miller & Pole, 2010; Olofsson, Lindberg & Hauge, 2011; Sim & Hew, 2010; Al-Qallaf & Al-Mutain, 2015; Hamid et al, 2015; Duarte, 2015). Where studies have been undertaken they have largely related to the areas of pre-service teaching, librarianship, technology related disciplines and sciences and as a result the research conducted to date cannot be generalised across all education (Sim & Hew, 2010; Williams & Jacobs, 2004). Furthermore the results of empirical research have shown mixed results with studies reportedly showing that students both do and do not benefit from the use of blogging technologies within their learning (Deng & Yuen, 2011; Kim, 2008).

In order to better understand how blogs could be used for teaching and learning it will be necessary to consider a number of factors. Firstly, it will be important to consider the manner in which blogs can be used as a teaching and learning tool within HE. Following this consideration should be given to whether blogs are able to support the type of pedagogy identified above as inherently beneficial to the Web Generation such as social constructivism. Thirdly the manner in which blogs specifically as a Web 2.0 tool may support the Web Generation and how students from this generation may perceive and interact with blogs and for what purposes they will be contemplated (Leslie & Murphy, 2008). Fourthly it will be necessary to understand the manner in which HE teachers, expected not to be from the Web Generation, may interact with blogs and how the manner in which HE teachers choose to engage with blogging technologies may promote or prevent the use of blogs within education. Finally, it will be crucial to consider the manner in which the
use of blogs may be affected by the assessment process, a vital part of the teaching and learning process within Higher Education.

2.5.1 The manner in which Blogs can be used within Education

The nature of blogs results in their ability to be used to support a wide range of teaching and learning activities and learning styles (Richardson, 2010; Williams & Jacobs, 2004) whilst also allowing learning to continue outside of the classroom (Lujan-Mora & Juana-Espinosa, 2007). Learning can be undertaken using blogs through activities such as learning journals, knowledge logs and reflective learning logs (Richardson, 2010; Robertson, 2011; Sim & Hew, 2010), student portfolios (Nguyen, 2006; Kamberi, 2015), personal diaries including expressing emotions and feelings and experiences (Deng & Yuen, 2011; Kerawalla et al., 2008; Lujan-Mora & Juana-Espinosa, 2007; Sim & Hew, 2010), interacting, collaborating and communicating with other people including authentic audiences outside of the students immediate community (Deng & Yuen, 2011; Downes, 2004; Ferdig & Trammell, 2004; Huette, 2006; Kerawalla et al., 2008; Kim, 2008; Lujan-Mora & Juana-Espinosa, 2007; Macduff, 2009; Nardi et al., 2004; Nguyen, 2006; OnlineEduBlog, 2009; Sim & Hew, 2010; Stone, 2004; Top, 2011; Tremayne, 2007; Williams & Jacobs, 2004; Kamberi, 2015; Noel, 2015; Ozkan, 2016), as a tool to share views, new ideas and opinions, (Ferdig & Trammell, 2004; Hunter, 2007; Top, 2011; Dowling, 2013; Kamberi, 2015; Noel, 2015) as an assessment tool (Lujan-Mora & Juana-Espinosa, 2007; Sim & Hew, 2010), knowledge conceptualization, (Sun, 2010; Noel, 2015) as a tool to gain increased access and exposure to quality information, (Huette, 2006) as a knowledge sharing tool (Du & Wagner, 2005; Hsu & Lin, 2008; Lin et al., 2006) and finally as a classroom and task management tool (Lujan-Mora & Juana-Espinosa, 2007; Nguyen, 2006; Sim & Hew, 2010; Top, 2011).

The wide range of activities that can be undertaken through blogs as identified above have also led to the identification of a wide range of skills that blogs can promote. These include improved writing and researching skills (Lujan-
Mora & Juana-Espinosa, 2007; Richardson, 2010; Top, 2011; Ozkan, 2016), reflective reading and writing (Instone, 2005; Lujan-Mora & Juana-Espinosa, 2007; Nguyen, 2006; Richardson, 2010; Top, 2011; Top, Yukselturk & Inan, 2010), greater creative, intuitive and associational thinking (Huette, 2006; Instone, 2005), improved skills in collecting learning resources and sharing ideas, opinions and experience (Kerawalla et al., 2008; Leslie & Murphy, 2008; Macduff, 2009; Top, 2011), taking greater responsibility for learning, (Ferdig & Trammell, 2004) learning to use new technologies, (Robertson, 2011) the promotion of critical and analytical thinking skills (Huette, 2006; Livingston, 2011; Lujan-Mora & Juana-Espinosa, 2007; Lee & Bonk, 2016), the promotion of analogical thinking (Huette, 2006; Richardson, 2010), developing knowledge communities, collaboration and social skills which are conversational (Instone, 2005; Kerawalla et al., 2008; Robertson, 2011; Top, 2011), active learning, (Du & Wagner, 2005), reflective learning, (Sun, 2010) knowledge construction and meaning making, (Ferdig & Trammell, 2004; Glogoff, 2005; Sun, 2010; Noel, 2015) peer facilitated learning, (Flatley, 2005; Luehmann & Tinelli, 2008; Macduff, 2009) giving and receiving feedback, (Macduff, 2009; Robertson, 2011) the value of, and respect towards others points of view and differing perspectives (Ferdig & Trammell, 2004; Leslie & Murphy, 2008; Lujan-Mora & Juana-Espinosa, 2007) and developing personal writing styles, particularly within a public sphere (Kerawalla et al., 2008; Naish, 2005).

Luehmann (2008) considers that the benefits of blogging can largely be defined as three categories:

1. Cognitive work – understanding issues relating to teaching
2. Affective work – sharing emotions
3. Social work – sharing resources and mentoring, etc.

These three different areas can each be considered to relate to an important area of blogging within an educational context as each of these areas can be seen to relate to the activities that will occur within offline teaching and learning. Within a traditional classroom setting it can be argued that students
are required to understand how teaching will occur, will be required to share emotions and will be required to undertake some sharing of resources and often a mentoring role. These are therefore important and useful activities which blogs can be considered to replicate online.

Deng and Yuen (2011) have created a framework which shows the affordances of blogs spanning a continuum from the individual to the community. This model, shown below (Figure 2.1), demonstrates the various ways in which blogs can be used to support educational activities within Higher Education. This model does not indicate though the extent to which students are actively engaged in these activities nor how this fits with the pedagogy and delivery of HE teaching and learning. This model also was formed from the study of pre-service teachers who are typically more likely to engage with and be open to new teaching methods. Even given these issues this model gives a basis on which to see how blogs can be used in education.

Figure 2.1 – The new framework for the educational affordances of blogs

![Diagram showing the new framework for the educational affordances of blogs](image)

Source: Deng and Yuen (2011)

Whilst it could be argued that these activities can be provided through more traditional forms of learning the use of blogs tends to allow communication and interaction with both other students and staff which would be more difficult to achieve using more traditional learning tool (Macduff, 2009).
Additionally the manner in which blogs allow group and collaborative work, knowledge sharing, a form of benchmarking and self-comparison, non-anonymity and individual feedback (Du & Wagner, 2005; Mansouri & Piki, 2016) are all considered to be benefits that blogs have over more traditional tools. Furthermore for some students the skills listed above may not be able to be developed without the use of blogs due to the type of course that is being undertaken (Naish, 2005).

Whilst there appear to be benefits, not all commentators believe that the use of blogs is beneficial and it has been claimed that Social Media and blog usage can in fact lead to poor writing skills due to the fact that regular writing can lead to greater use of slang and poor use of English (OnlineEduBlog, 2009; Mehmood & Taswir, 2013; Faizi, 2015). Additionally learning using blogs can be adversely affected by poor participation in terms of irregular contributions, minimal communication between bloggers and poor reflection within blogs (Kerawalla et al., 2008). Additionally whilst blogs may enable some students to undertake activities that they might not otherwise be able to undertake, it is important to note that blogs will not be suitable for all learning activities e.g. practising and performing would be difficult, although not impossible, to achieve (McGee & Diaz, 2007; Mansouri & Piki, 2016).

With this in mind, where blogs have been used, some researchers have found that blogs are able to mitigate against negative student behaviour or beliefs. In some cases, blogs are even considered to be highly motivating to students and provide opportunities for students to find a voice. For example, those who may not participate in a class discussion may participate in discussions via blogs due to their greater comfort with the medium (Kerawalla et al., 2008; Nguyen, 2006). Blogs have also been shown to decrease feelings of isolation (Instone, 2005) as they can overcome the anonymity of a large lecture session by allowing students to work in smaller groups and create smaller learning communities (Halic et al., 2010). Blogs have also been found to provide emotional support to students (Kerawalla et al., 2008) and have reportedly been able to overcome problems where only surface learning occurs allowing students to undertake learning at a deeper level than
traditional teaching and learning approaches may support (Instone, 2005; Sun, 2010).

Lai & Chen (2011) further support the use of blogs within education by considering that they can help to improve the effectiveness of teaching, help create discussion and debate, improve communication between students and staff and can enable students to become more responsible for their own learning. In fact blogs have been shown to allow students to move beyond “processing” through which they just access information to forms of learning in which they are more fully involved in the collaborative activities of sharing, creating, analysing and evaluating knowledge with their peers through interaction and communication which is social in nature (Top, Yukselturk & Inan, 2010).

Furthermore blogs are considered to uniquely provide the opportunity to bring together personal narrative and critical reflection and therefore bring a ‘….reflective cognitive dimension to personal narrative and introduce an emotional and social dimension to formal academic work that often accentuates cognitive or intellectual tasks’ (Deng & Yuen, 2011).

However in order for the successful use of blogs within HE teaching and learning to be achieved it is vital that students are encouraged to engage with the necessary tasks and with a wider community than they may perhaps wish to, avoiding the temptation to retreat into what is more familiar rather than engaging with those outside of their usual “comfortable” social community (Macduff, 2009).

It is also important that students are encouraged to become fully participating members of an online community (Sun, 2010) and in order for learning to take place it is important that the environment is appropriate. Garrison, Anderson & Archer (2000) have identified three factors that need to exist in order for learning to take place in an online environment:
1. Cognitive presence – students are enabled to construct meaning through continued communication
2. Social presence – to enable individuals to project their own characteristics to the community
3. Teaching presence – relates to the design of the educational experience

In order to consider the cognitive, social and teaching presence it will be essential to consider in what ways this presence may be promoted within a teaching and learning situation and why these may be inconsistent with teaching and learning in its current form. It will be necessary to consider these therefore in relation to the nature of students, as members of the Web Generation, the role of academic staff when using of blogs within education and firstly the role of pedagogy within teaching and learning, specifically social constructivism and CoP theories as without the application of a suitable framework within which learning can take place it will be unlikely that blog usage will improve student learning (Top, 2011). Therefore, the issue of pedagogy within the use of blogs shall firstly be considered.

2.5.2 The pedagogy of blogs
Whilst it is clear that blogs have the potential to support student learning in a range of ways, the lack of empirical evidence to support this may indicate that in reality blogging is suited to only some forms of pedagogy. Therefore, where forms of pedagogy are used for which blogs are not suitable, learning will not be successful if blogs are utilized (Mansouri & Piki, 2016).

From existing studies it would appear that blogs allow a degree of flexibility in the manner in which learning can be developed from relatively structured HE teacher-centred activities to more flexible student-centred activities (Olofsson, Lindberg & Hauge, 2011). It is generally considered that the use of blogs for education is best suited to those pedagogies which are most highly student focused (Instone, 2005). Blogs are also considered to largely be social constructivist teaching and learning tools (Richardson, 2010). This is due to the manner in which blogs can promote both social and active learning through collaborative activities which support knowledge construction (Ferdig
& Trammell, 2004; Top, 2011). Collaborative activities are important for social learning as this ensures that students undertake reflective learning. In the case of blogs students are expected to reflect on their own experiences as well as sharing these experiences with other students who are facing similar opportunities and challenges and in this way students can learn from each other (Bryant, 2006).

In addition to supporting social and constructionist learning blogs can be considered to be closely aligned to the concept of CoP (Schmidt, 2007) although this is in a more general sense than the definitions proposed by Lave & Wenger (Schmidt, 2007). In this context blogs are considered to allow the formation of communities that are defined and bound together by practice (Silva, Goel & Mousavidin, 2008).

It would appear therefore that there are two main ways in which blogs can pedagogically support teaching and learning, firstly through social constructivism and secondly through the creation of CoPs both of which shall now be considered in more detail.

2.5.2.1 Social Constructivism and Blogging

As discussed above Social Constructivism indicates that learning will occur where knowledge is constructed and reviewed by the learner through collaborative activities. It would appear from existing literature and studies that this is a form of learning that will be potentially effectively supported through the use of blogging technologies (Karasavidis, 2010; Top, 2011; Williams & Jacobs, 2004). This is mainly due to the manner in which blogs provide an opportunity for both collaboration through social interaction and the creation and construction of knowledge. This is achieved by providing opportunities for group and peer interactions and the sharing of differing perspectives, viewpoints and interpretations of events, experiences and activities (Halic et al., 2010; Leslie & Murphy, 2008).
Blogs can also satisfy the key constructivist requirement for authentic learning as they allow students to publish their ideas and feelings for real audiences to comment on and read (Deng & Yuen, 2011; Ferdig & Trammell, 2004). These audiences therefore do not just include HE teachers but also students by facilitating peer-to-peer learning (Olofsson, Lindberg & Hauge, 2011) and even others outside the classroom. In fact these blogging conversations can be global or local depending upon the topic, blogger and the community (Efimova & De Moor, 2005). Furthermore it can be argued that blogging provides students with opportunities that were previously not available to them and can enable a new type of social learning environment to form (Top, Yukselturk & Inan, 2010). This additionally allows greater opportunities for activities such as scaffolding and mentoring to occur (Nguyen, 2006).

However whilst the social construction of knowledge is an essential aspect of teaching and learning using blogging technologies it is also imperative to consider the manner in which the social interactions experienced and creation of a social presence can lead to increased opportunities for learning (Leslie & Murphy, 2008) and higher levels of perceived learning (Halic et al., 2010). This can be achieved through the formation of CoP which allow multi-directional connections through blog-rolls and linkages between individuals and groups (Efimova & Hendrick, 2005; Tremayne, 2007). The manner in which blogs can support CoP and situated learning shall now be considered in more detail.

2.5.2.2 Communities of Practice and Blogging

Whilst the concept of CoP shares some similarities with the ideas of social constructivism, the differences generally relate to the manner in which learning can occur through social interaction within a social constructivist framework and will occur within a community or collective manner within a CoP.
Perhaps what makes blogging such an interesting prospect for teaching and learning is the extent to which blogs have a potential to offer students a “safe” audience for their writing, enhanced opportunities for collaborative learning (Robertson, 2011; Top, 2011) and the fostering a sense of a community of learners (Nguyen, 2006; Top, 2011; Duarte, 2015). It has also been found that higher levels of interaction have been linked to higher perceived levels of learning (Halic et al., 2010).

In reality Karasavvidis (2010) considers that technology development such as the use of blogs is now allowing greater opportunities for the development of new methods of working and this in turn is allowing greater opportunities for collaboration and interaction so that collaboration and interaction can now occur not just between the HE teacher and their students but also amongst groups of students (Hunter, 2007) potentially forming CoPs. However if communities are only formed from only amongst students there may be a large number of other audiences that may be missed (Halic et al., 2010) and the opportunity for students to engage with existing CoPs may be unexploited.

In reality one of the major benefits of the use of blogs is the manner in which feedback can be sourced from an increasingly diversified audience and on a scale which has not previously been practical within a formal educational experience (Maguire, 2005). Most crucially this feedback from outside the classroom is often considered to be a powerful motivator for students (OnlineEduBlog, 2009; Richardson, 2010). This is the point at which CoPs may truly therefore be established within the teaching environment.

Blogs also allow for large groups of students to be brought together at one time through the use of collaborative blogs. (Maguire, 2005). It is important to note that collective blogs still enables the generation of a strong sense of community, collaboration and debate (Williams & Jacobs, 2004). Additionally it has been reported that involvement within an online community increases a sense of belonging which is beneficial to individual learning and this reflects the concept of CoP (Ziden et al., 2009). This is also reportedly especially important for those individuals who seek more detailed interactions than
maybe traditionally available (Kaye, 2007) and which would be expected of the Web Generation.

Within blogging there are two main ways in which a CoP may operate, firstly through collective blogs (Lujan-Mora & Juana-Espinosa, 2007) and secondly through individual blogs within the blogosphere. Individual bloggers are able to form communities due to the manner in which blogs are inter-related via blog-rolls and also via track-backs through individual blogs. Both of these aspects of blogs along with comments result in the formation of a community built around a specific group of individuals or individuals with similar interests both inside and outside the classroom (Nardi et al., 2004; Singer, 2009).

Singer (2009) considers that it is the manner in which blog communities are based around a specific issue or group of people that allows a valid and viable focused community to be formed. Whilst blogs can result in the formation of a blogging community and therefore provide the opportunity for learning to occur it is important to note that having a blog does not automatically guarantee that a community will be formed and even where Communities are formed they can take time to develop (Nardi et al., 2004). This is particularly relevant where CoPs are considered as it is the domain, practice and community, which are formed over time which makes the CoP successful (Smith, 2003, 2009).

Additionally, it can be noted that where students try to join well-established existing communities, barriers may exist, as within all CoPs as newcomers will be required to learn the rules of the community before being allowed full membership. Within blogs the informal rules which are created around a community are commonly known as “blog etiquette” and are likely to differ depending upon the nature community and its participants. These rules are not published or known to individuals outside of the group (Schmidt, 2007) and so it can take time for students to become familiar with them. This again demonstrates the characteristics of a CoP.
Students will also need to become familiar with the ‘different sense of rhythm and continuity when you follow a blog, or a group of blogs, over time, compared to simply reading a single post that you’ve found through a search engine or by following a link from another Web site’ (Rettberg, 2008). However, these issues can potentially be overcome via LPP if membership is open to the student at all.

Whilst LPP is a key aspect of CoP within online blogging communities it can seem to existing members that ‘newcomers, drawn to see what’s going on or foraging for information themselves, often enrage the established dwellers of an e-community. They don’t know as much, ask stupid questions, and speak a different language. Intruders, they throw the ecological balance out of whack’ (Katz, 2002).

To a newcomer it can appear as though the community is closed and that they are not welcome participants amongst existing members (Powazek, 2002). It is also important to note that the nature of online communities can make the likelihood of potential conflicts between individuals higher as by their nature within electronic communities, individuals may be more likely to disagree. This is due to the way in which individuals do not consider that they are attacking people they know but are instead interacting with disembodied voices with whom they do not have a personal connection and may never even meet (Katz, 2002).

Perhaps therefore it is unsurprising that LPP often occurs with blogging communities through the practice of “lurking”. Within blogging communities lurking is traditionally thought of as the manner in which individuals will read as opposed to write blogs and is reportedly something that the majority of students prefer to do (Halic et al., 2010).

Traditionally lurking leads to a negative perception of an individual (Ziden et al., 2009) and is considered to indicate a lack of engagement as it appears as though no matter what a HE teacher does these students will not engage with the community, if participation is only seen as the act of writing (Glogoff,
Lurking is a principal aspect of blogging to consider as by reading other blogs students are still expected to be able to learn and to benefit from the acquisition of new knowledge, skills and learning the rules of the specific community. This is supported by the theories of learning relating to Bandra (1977) and can be considered to be forms of vicarious learning. Therefore this should be accepted to be a legitimate form of participation and a crucial although problematic, aspect of academic blogging as it may be difficult to judge those who are engaged in this type of activity and those that are not (Deng & Yuen, 2011; Kim, 2008).

Whilst the pedagogies of social constructivism and CoP have now been considered, it is clear that the role of both the student and the HE teacher will need to be considered in more detail as both appear to play a significant role within the successful implementation of blogs. The role of students will be considered first before considering the role of the HE teacher within the use of blogs for teaching and learning within HE.

2.5.3 The Role of the Student Within the Use of Blogs for HE Teaching and Learning

The individualistic nature of students within the learning communities formed will naturally result in a community formed of diverse opinions and interests (Lujan-Mora & Juana-Espinosa, 2007) and also students with a range of personalities and personal styles (Downes, 2004; Efimova & Hendrick, 2005; OnlineEduBlog, 2009; Stone, 2004).

The asynchronous nature of blogs will particularly provide greater opportunities for non-traditional students such as those who may be studying part time or have commitments outside their education which means they may
not attend in a standard format or may have a preference for online learning (Maguire, 2005).

However it cannot be assumed that all students will be receptive to the use of blogs within their learning and as a formal part of their course (OnlineEduBlog, 2009). Whilst LPP (the reading of blogs) may provide an explanation for an apparent lack of engagement with blogging tools it is imperative to note that those students who engage the most through writing also reportedly generate the highest level of comments from other students. This is considered to indicate that engagement particularly through self-disclosure is a vital aspect of blogging activity without which blogs may not be a useful learning tool (Leslie & Murphy, 2008). Even when students do post the manner in which posts are phrased can potentially encourage or discourage comments and therefore students may consciously or unconsciously frame their posts in such a way as to elicit comments or not from others. Students may be especially aware that they will be able to control their own posts but not the comments of others (Gumbrecht, 2004). There may be, therefore, for some students a conflict between the manner in which individuals may wish to write posts for themselves and the manner in which individuals will be aware that there is an audience reading their posts (Sun, 2010).

For others however the manner in which comments can be received and they are able to communicate their thoughts to a wider audience will be a significant driver to blog use (Fullwood, Sheehan & Nicholls, 2009). The nature of blogs as providing decentralized authorship which allows students to control their space may potentially enhance this further (Lin et al., 2006). It is imperative to note that where a collective blog is used, engagement may again be affected as this reintroduces a centralized environment which may again create anxiety for those students who find communication with students they don’t know difficult (Kim, 2008).

It is important when considering engagement with technology that, even within a traditional classroom setting, there will be those students who do not wish to
speak in front of the group and this may potentially also occur online (Kamberi, 2015; Lee & Bonk, 2016). Equally some students may be more comfortable within the confines of a personal blog and may feel more willing to engage in this way (Macduff, 2009).

Additionally, a lack of engagement by a small number or individual students will represent an issue for HE teachers as students who are unwilling or unmotivated to blog will not engage with the community that is formed within the blogosphere. This may result in the need for HE teachers to provide alternative ways in which students can undertake the activity in addition to the provision of blogging tools (Sherman, 2009). Alternatively, students may fail to complete the task at all. Prensky (2010) considers though that it is inappropriate not to use technology solely because a small number of people will not have the same access as other. He suggests that this can be overcome by ensuring that any students that do not have access to the required technology work within teams with those who do have access or alternatively the institution should provide adequate access to the technologies required.

Even when students do have access to technology, problems with engagement may still exist as some previous studies have shown that the novelty effect of new technology will be likely to result in an increased tendency for students to use technology for a short period of time and as a result initial blogging may only continue for a short period of time (Sim & Hew, 2010). The nature of blogs also allows students to be as actively engaged as they choose to be (Kaye, 2007) and therefore they will be able to choose to disengage with blogging as soon as they want to. This is further compounded by the fact that not only is participating in blogs not for everyone, (Downes, 2004; Stone, 2004) but that in order to realise the full benefits of blogs there is a requirement for long term commitment which simply cannot be faked on a long term basis (Singer, 2009).

The level of commitment in terms of time required is something which is often underestimated (Macduff, 2009). Not only does it take effort to start a blog but
also to maintain a blog as readers will expect regular updates and changing content (Hsu & Lin, 2008). This can be a particular problem if the time required to complete the task is not included in the course timeline and reflected as part of the assessment weighting (Livingston, 2011). These factors are reportedly often the reason for the relatively quick abandonment of blogs (Churchill, 2009; Ferriter, 2009; Hsu & Lin, 2008; Instone, 2005; OnlineEduBlog, 2009; Ziden et al., 2009).

It is important to note also that students will not necessarily perform educationally in the same way over time (Du & Wagner, 2005) and as the majority of previous studies are taken over one semester (Sim & Hew, 2010) previous results may not reflect the true use of blogs by students on an ongoing basis.

In addition to issues of time, students may be concerned with the loss of privacy that will occur through the use of blogs. Students will generally be required to provide identifiable information, photos or other personal information which may result in possible repercussions. This is particularly a problem as the nature of blogs can give a false sense of security. A sense of security can be formed due to the format and style of the tool which most often feels to the user akin to a private journal, diary or “safe space” in which to reveal information when this is not the case (Instone, 2005). In reality information is publicly available and consequently could be seen by potential employers or other interested parties in the future (Guadagno, Okdie & Eno, 2008).

This can in part be resolved by the fact that some blogs may only be accessible within a closed environment such as within a VLE, however, in the majority of cases blogs will have some form of audience. Even when a blog operates within a closed community, which is sometimes known as private (Waters, 2016), it will still have an audience. Within a closed community, the audience is however chosen, usually by the blog author (Waters, 2016). Without an audience, it is unlikely that a blog will function particularly well (Mohr, 2016). This is due to the fact that the nature of a blog requires an
audience to be present for the blog. If there is no audience this would instead be an online journal or diary (Roeder, 2016).

This will be exacerbated where blogs are used for educational use and confidentiality cannot be assured (Andergassen et al., 2009; OnlineEduBlog, 2009; Stone, 2004). This will be more fully seen where students are not familiar with the technology being used and therefore may not fully understand the amount of identifiable information that may be provided through blogging (Guadagno, Okdie & Eno, 2008).

It should be noted, however, that this does not necessarily mean that individuals will have anything to hide but that they may instead simply wish to maintain privacy (Association of Lecturers and Teachers (ALT), 2010). For example students may not wish to share their emotions honestly in a public sphere where they know that both staff and their peers will be encouraged to read their blog (Robertson, 2011).

As a result of some of these issues, the majority of students who start blogging will, as previously discussed, end up quitting within a few months (Hyatt, 2011). It is necessary therefore to consider in more detail the extent to which students may be unmotivated or unwilling to use blogging tools and whether this potentially will prevent the successful use of blogs within education.

Suarez (2007) considers that motivation is extremely significant for usage of Social Media and blogs as it ‘is the attitude you’ve got to have to “want to” and that isn’t something you can get out of a box.’ Kerawalla et al (2009) more specifically consider that blogging behaviour is affected by a combination of six factors; comments, presentation, community, audience, pedagogy and technology. However, whilst they provide a framework for student and HE teachers use of blogs this model does not provide an indication of how to improve motivation for use.
Without a motivation for use it will be unlikely that an individual will wish to overcome other barriers in order to use blogs and consequently blog use within education will be difficult to achieve. For example for those who have not blogged before a barrier for use may exist simply from the manner in which for the majority of people, doing something for the first time will cause apprehension and possibly fear (Prensky, 2010).

Alternatively though a lack of engagement with blogging within a formal educational capacity may simply be due to the manner in which some individuals may already have satisfied their need to socialise or write on the internet via other tools or existing blogs and they may not therefore wish to replicate their efforts in a second form (Andergassen et al., 2009). This may be particularly the case for those individuals who already seek feedback and comments from external sources as opposed to solely family or friends (Prensky, 2010; Richardson, 2010).

Whilst lack of engagement can occur for a number of reasons, the initial motivation for starting to blog are also considered to occur for a diverse number of reasons. Andergassen et al (2009) for example considers that students can be motivated to start blogging as a result of a desire to write, use technology, communicate or socialise. Blood (2002) meanwhile considers that there are three main motivators for why individuals will keep a blog, namely building a reputation, expressing oneself personally and sharing information. Blood also considers that whilst any of these motivators may be the reason for creating a blog eventually all three will need to be undertaken in order for a blog to be maintained on a long-term basis.

This perhaps relates to the idea that just as previously discussed the Web Generation is not necessarily a homogenous generation. Furthermore, the manner in which the Web Generation may choose to utilise blogs will not be homogenous and therefore the manner in which blogs are utilised may be extremely varied. For this reason gaining a better understanding of student perceptions of blogs will be vital to understand how students may interact with
blogging tools and the purpose for which they may be used (Leslie & Murphy, 2008).

Kerawalla et al (2008) identify a number of additional reasons why students may not interact with blogging, including that students felt they had nothing of value to say, students felt that it would not be worth their while to blog, students will not have the skills required to select the appropriate material to put within their blogs, students may plagiarise others when posting in their blog and finally the issues of self-disclosure and privacy are again raised.

There are also imperative aspects of community and feedback to consider. For example those who are influenced by community are likely to be highly influenced by the number of comments and the amount of feedback they gain, whereas those who are not, are likely to be more influenced by the personal space and limited interactivity blogs can provide (Gumbrecht, 2004). It is thus the manner in which blogs offer both personal and community space simultaneously (Efimova & De Moor, 2005) that may make blogs most appropriate for student use.

Whilst there are therefore clearly reasons that prevent students from blogging or continuing to blog, there are also a number of differing motivations and different types of usage of blogs that are successful. This can generally be related to a range of electronic communities which Katz (2002) considers can take the form of village in which different users will fulfil different roles as follows:

- **Foragers** – The people running sites or submitting and linking to discovered information
- **Lurkers** – The largest group, professionals, academics, researchers and others, whose need for information is practical, and who wait for it, usually in silence
- **Fishermen** – People who trawl selected sub-topics or discussions for specific data…
• ** Helpers** – knowledgeable veterans who welcome newcomers and sees them as an opportunity to grow the village
• **Ideologists** – Vigilant for deviations from what they perceive the sites main purpose to be. They criticise sometimes sharply but rarely with cruelty
• **Defenders** – Ideologically driven flamers who seek to keep their community pure
• **Anonymous cowards** – either individuals who have legitimate information they can’t share under their own name or exhibitionists who express hostility with consequences (most often why communities collapse)
• **Techs** – People for whom the construction of the site is its own regard

The nature of the range of roles undertaken indicates that there may be differing motivations for blogging within education and therefore that students may be gaining different experiences as a result of the role that they undertake. Kerawella et al (2008) identify five different kinds of blogging behaviour that are seen within student use of blogs:

1. Blogging avoidance
2. Resource network building
3. Support network building
4. Self-sufficient blogging
5. Anxious, self-conscious blogging just to complete the suggested course activities

Whilst the role of students has therefore been considered it will also be important to consider the role of HE teachers who would appear to be able to significantly influence the success of the use of blogs within an HE teaching and learning context. This shall now therefore be considered in more detail.
2.5.4 The role of the HE teacher within the use of blogs within education

The role of the HE teacher within the use of blogs can be seen to be of high importance as not only does the success of blogs depend to a large extent of the HE teacher’s capability in delivering and supporting the tools used, (Kim, 2008) their decisions about where and when to use such tools (Kent & McNerney, 1999) and also the selection of blogs as an appropriate tool for learning will likely depend upon the HE teachers preferences, skills and pedagogical position (Greener, 2009; Caruso & Kvavik, 2005). Additionally, students will most often view the effectiveness of blogs as a tool for teaching and learning only through the experience of use by their HE teacher (Nambiar & Thang, 2016). This will be the case even though the successful use of social software for learning will be reflected through use by students (Andergassen et al., 2009). It is also important to be aware that when HE teachers use blogs this is also likely to affect the way in which students perceive the use of blogs for teaching and learning in the future also (Baldea, Maier & Siminescu, 2015).

Halic et al (2010) consider that there are three main ways in which HE teachers can use blogs to support teaching. Halic et al (2010) consider that by reading student blogs the HE teacher can identify any issues students may have with the course and assist students to overcome them. By reading student blogs HE teachers will be better able to appreciate what students refer to as “expert” knowledge. Finally, by reading and commenting on blogs, HE teachers can identify points that students may need clarification with.

These are also supported by Noel (2015) who considers HE teachers need to create an effective learning community by encouraging ongoing collaboration, a sense of community, demonstrating engagement and maintaining a sustained online teaching presence by facilitating discussions and also by providing direction and assistance to students.
Additional benefits have been identified as including perceived enjoyment, perceived ease of use, personal innovativeness, enjoyment in helping others, institutional support and perceived usefulness (Lai & Chen, 2011).

A potential issue for academic staff wishing to use such tools however can often be the lack of sound theoretical grounding and design for the use of blogs within teaching and learning (Olofsson, Lindberg & Hauge, 2011). Some HE teachers that use such tools can also be perceived to promote the use of technology whether it is valid or not just because they wish to use technology (Prensky, 2010). It is consequently vital that any use of technology by teaching staff must meet with the course design and pedagogy (Halic et al., 2010; Kerawalla et al., 2008; Macduff, 2009) and not be added as an “afterthought.” Additionally it must fit with the Institution’s technology strategy and culture ensuring technology will be supported and available to students freely (Sherman, 2009).

In reality HE teachers should be free to choose new tools that they consider to be the most appropriate for use and respond both critically and creatively to any new tools on offer (Beetham & Sharpe, 2007). In addition any technology chosen must be appropriate to the learning context and the reason for its usage must be understood and accepted by both the staff and students involved in the teaching and learning taking place (Dunworth & Scantlebury, 2007). This is of high importance as the learning context will have a significant impact on the motivation of both staff and students (Allan, 2007).

One area of concern for educators also will be the responsibility HE teachers would have for ensuring blogs are used in a safe and responsible way when students are asked to publish information outside the classroom as an integrated part of the course or programme of study (Richardson, 2010). Issues that must be considered will include how to limit potential occurrences of cyber-bullying which can represent a real issue within online communities (Association of Lecturers and Teachers (ALT), 2010), and who will be responsible for blogs following the end of the course, particularly in relation to
who owns the information within them and who will continue to manage them (Richardson, 2010).

It is imperative that these types of issues are considered within the context that for some HE teachers, particularly those that can be considered digital immigrants, the use of technology itself may represent a significant barrier to use. Not all HE teachers may want to use new technology and even where staff may be willing to adopt new technologies it is critical to note HE teachers may take anywhere from three to four terms to adopt a new learning technology (McGee & Díaz, 2007). They may additionally need exposure to and advice about how to apply such tools (JISC InfoNet, 2008).

HE teachers will also potentially need to adapt to the new opportunities technologies such as these (including opportunities to use RSS feeds, etc.) provide to enable students to work more flexibly and as previously discussed work in a more “anytime, anyplace manner.” (Lujan-Mora & Juana-Espinosa, 2007) The ability for students to continue to be engaged with the HE teachers outside of the classroom and continue learning outside of the classroom will also have a significant effect on the manner in which HE teaching staff may be able to design activities and assignments (Richardson, 2010). HE teachers will also be able to be more in touch with larger groups of students ensuring students are engaged in learning (Lujan-Mora & Juana-Espinosa, 2007). However, it may also lead to greater expectations by students that staff will be available to respond to them in an anytime, anyplace manner.

It is therefore clear that the use of blogs and such technologies will be expected to work most successfully for those staff and students who have a high level of digital literacy (Andergassen et al., 2009; OnlineEduBlog, 2009; Richardson, 2010). However an acceptance of, or desire to, use the technology alone on behalf of the HE teacher will not be enough to ensure blogs will be successful within a teaching and learning capacity (Downes, 2004).
In previous research it has been shown that HE teacher involvement within blogs is important as not only does it encourage students to blog themselves but also gives the student an impression that the HE teacher is more involved within their learning (Churchill, 2009). It has also been shown that a greater sense of community can be enhanced by both student and HE teacher involvement within the community created by blogging (Yang et al, 2016). This further supports the need for HE teacher involvement within student blogging activities (Halic et al., 2010; Yang et al, 2016).

Allan (2007) further supports this view by considering that HE teachers who are encouraging and enthusiastic in the use of blogs and the formation of a community will be more likely to demonstrate commitment to the use of technology. This is likely to enable students to also become participants who are actively involved in the community, whereas staff that are not committed or indicate negative or even cynical opinions towards the technology can significantly affect student perceptions of learning using such technology. It should be noted additionally that it may be the influence of HE teachers that has led to reports of poor levels of student engagement with blogs when used for teaching and learning in previous studies (Robertson, 2011).

Negative attitudes towards technology can largely be considered to exist due to concerns staff have about facts such as the affect this may have on jobs, the expectations of less use of full time academic staff, the possible drop in quality of courses which are delivered online, a lack of available time, a lack of University support for blogging activities, issues relating to training in blogging technologies and finally the lack of academic respect for courses delivered using online tools (Maguire, 2005). Additionally, negative influences may exist due to the manner in which HE teachers will expect to be required to spend additional time and effort in undertaking blogging. HE teachers may also expect to attract criticism as a result of adopting new technologies and may consider that they may lose the advantages of their unique knowledge by posting learning materials and knowledge online (Lai & Chen, 2011).
It must be noted that to some degree the nature of digital immigrants must be considered in terms of the accepted use of technology by staff in so far as it would be expected that HE teachers would be less willing to use technology than the students they are teaching as they are more likely to be digital immigrants. However Chisholm (2006) has noted that whilst age does have an effect on the usage of technology by HE teachers this is due to the position older staff are likely to be in within their career and their lack of motivation to change their working practices when they have already established themselves as experts within their field. HE teachers at this stage of their career may see change as taking a significant investment in both time and effort which they do not wish to make.

The requirement of time needed to create blogs and design learning activities including the effort required to codify knowledge will be expected to be significant (Lai & Chen, 2011). HE teachers must also be aware of the time it will take to ensure all students are actively engaged and that they will need to challenge and respond to student posts via feedback and comments. HE teacher feedback of this nature is vital to ensure that students are adequately learning. Not only is feedback by the HE teacher required but it will also be essential that feedback is timely and relevant and this will depend upon the manner in which the course and activity is planned by the HE teacher initially (Livingston, 2011). Whilst the time required to make a blogging activity successful may be fairly substantial, it would appear that where this is embraced the effort is worthwhile (Macduff, 2009). Although the effort required will depend upon the HE teacher who will not only need to develop new skills relating to technology but will also need to become used to the new role they will have in the learning process within a social constructivist or CoP framework. In such a learning framework, they will be required to move from the traditional role of evaluator to one of a connector. This once again may represent a significant challenge for them (Richardson, 2010).

Whilst the role of the HE teacher has been considered it will also be vital to consider the role of assessment within the teaching and learning process and the manner in which assessment may be able to support or undermine the
use of blogs within an educational context. This will now therefore be considered in more detail.

2.5.5 Assessment

Within education today students can often be outcome orientated and task focused which can result in students finding the use of blogs and blogging activities within a course difficult to understand (Kerawalla et al., 2008). It is therefore important to ensure that if blogging activities are going to be included within a course the assessment of the activity must be clear (Livingston, 2011).

One way in which this can be overcome is through the inclusion of an element of assessment, as assessment is an essential factor when trying to motivate students to engage with blogging as part of a course (Churchill, 2009). Whilst taking away the optional element will ensure that students will be required to blog it is likely that some students will choose to still only engage at a minimal level or not engage at all. This will therefore result in a lack of real learning from the experience for these students (Brescia & Miller, 2006). The nature of students as only doing the minimum required to pass the course has led to Du & Wagner (2005) naming this group of students as “satisficers”. This also is supported by previous studies have shown that some students will not engage within blogging activities at all if they are not awarded marks or assessed for their efforts (Cobanoglu & Berezina, 2011; Glogoff, 2005).

Whilst the result of students only participating in order to pass the course is expected to result in a lack of learning, there is also the likelihood that this will detrimentally affect the learning experience for all students particularly given the community and collaborative nature of blogs. When students are participating for the sole purpose of passing the course, a lack of engagement is likely to have a detrimental effect on the entire community, thereby also affecting the experience for other more committed students (Williams & Jacobs, 2004).
Some students, particularly those who are highly influenced by performance, may also be less willing to reveal potential inadequacies, emotions, misconceptions or difficulties experienced within their blogging experience where assessment is undertaken for fear of receiving a negative assessment outcome as a result (Kerawalla et al., 2009; Robertson, 2011).

Furthermore, grading may be difficult in relation to assessing the contributions that may have been made by individual students across a blogging community. It is also possible that final grading may be easier and faster if carefully managed (Lujan-Mora & Juana-Espinosa, 2007) and use of both formative and summative assessment is made. It is important to be aware however that when including blogs within a course as an assessable aspect, the flexibility given to students in relation to design and personalisation may also prove to make assessment a more complex task (Richardson, 2010).

This perhaps represents one of the barriers to usage of blogs within HE teaching and learning as there are currently relatively few guidelines for developing effective learning activities using blogs and as a result student blogs can be variable and the volume of feedback required can be significant (Robertson, 2011). In reality it appears as though the nature of course design will be vital in relation to the success of blogs within teaching and learning. It will only be by ensuring that the course design is appropriate, HE teachers can help students to achieve the “selfish interest” they will hold of ensuring they pass the course whilst also ensuring that students are able to add value to the experience of others at the same time (Mason & Rennie, 2008).

It is important to note however that previous research has indicated that even where blogs are a requirement of the course, students will aim to do the minimum possible to pass, often writing posts of limited worth within blogs which are abandoned quickly after the end of the course (Downes, 2004). This would perhaps indicate that students may not see a long-term value in blogging and instead may be using the site simply for the purposes of satisfying the needs of the course or more specifically any aspect of
assessment that may be dependent upon undertaking blogging activity. Therefore when undertaking the design of blogging activities within a course it may be necessary for HE teachers to consider the manner in which they may be able to promote blogs as a tool for life long and continued learning as opposed to solely for the passing of the course (Olofsson, Lindberg & Hauge, 2011).

It would appear from previous research that in reality blogs as a learning tool are most successful where they are used as flexible, voluntary and loosely prescribed tools (Kerawalla et al., 2008). However this can result in blogs becoming quite difficult to feature within a formal learning environment as they become increasingly personalised and free from institutional control (Naish, 2005). In this form, it is unlikely that blogs would be able to be an assessed element of education and as previously discussed a lack of student usage is likely to ensue.

2.6 Summary of Literature Review

From the literature reviewed above it is clear that there is a range of ways in which blogs are thought to support both teaching and learning (Guadagno, Okdie & Eno, 2008). However, there has been relatively little empirical research undertaken in order to support the use of blogs within education (Bennett, Maton & Kervin, 2008; Jones, 2010; Waycott et al, 2010). As a result, there is no clear indication of whether learning does take place within these contexts. This also results in a lack of clarity of whether there is a method of design or delivery that will promote learning to a greater extent than other approaches.

Whilst it has been reported that the use of blogs as a Social Media tool will appeal to students, as members of the Web Generation (Rosen, 2010,2011; Rosen et al, 2013). It has also been argued however that any students or teachers who are not members of the Web Generation may not wish to use blogs for teaching and learning and will fail to understand how such tools can
be used to support learning (Prensky, 2001a). One of the issues within this area is that there is as yet no clear empirical evidence to support this.

It has also been reported from this literature review that those individuals who support constructivist models of teaching and learning are more likely to support and embrace the use of blogs within teaching and learning (Siemens, 2004). Constructivist principles can include a range of the different approaches to learning discussed within this literature review such as CoPs (Lave & Wenger, 1991), social learning theory (Bandura, 1977) and social constructivism (Vygotsky, 1978). It is important to consider that these learning theories are very different in comparison to more behaviourist views of learning (Margaryan & Littlejohn, 2008).

From this literature review it appears that there are a number of ways in which students can participate within a blogging community through writing, reading, reading the comments other provide and making comments on others blogs (Efimova & De Moor, 2005). Blogs can also be used in a range of different ways and can include individual or collective use (Garcia, Brown & Elbeltagi, 2012). However there appears to be a lack of understanding of the role of each of these activities within the learning process. It is also unclear whether the role students choose to take within a blogging community will affect the success they have in terms of their learning outcomes.

In light of the range of issues that have been identified from the literature review it will be necessary to consider the research aims and questions that will be considered before a research model can be created in order to determine the extent to which blogging may be able to be used within teaching and learning within Higher Education.
3. Conceptual Model and Hypotheses Formation

Within this chapter the contribution to knowledge, research questions and proposed framework for the research will be explored and the research hypotheses will be developed. Before discussing the hypotheses development and the formation of the research model, the contribution to knowledge and research questions shall be discussed.

3.1 Contribution to Knowledge

From the literature discussed within the previous chapter it is clear that there has been an increasing use of Web 2.0 technologies, Social Media and blogs within the everyday lives of students within the UK and the US. This increase has led a number of commentators to define the generation of students entering Higher Education today as The Net Generation (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott), Millennials (Doherty, 2005; Howe & Strauss, 2000) and more recently the Web Generation (Rosen, 2010). Although they have different titles, these definitions all focus on the belief that students are now using web based technologies, Social Media and blogs more extensively as part of their everyday lives than ever before.

Whilst the definition of students as technologically immersed has therefore been explored in some detail, there is much less evidence of empirical research which has been undertaken to confirm that students who are at University today are part of the Web Generation and do respond positively to technology within all aspects of the lives and specifically in term of educational use. This is therefore an area that will be considered in more detail within this study.

When considering the use of Social Media and blogs within education one of the most popular and prevalent within HE teaching and learning is blogs which is increasing being used by a number of teachers around the world (Kamberi, 2015). We have seen through the literature explored that there are
a number of ways in which blogs can be considered to support education however once again there is little empirical evidence to support their use within education. The influence of key aspects of the blogging experience such as the socio-technical structure and rhythm (Efimova & De Moor, 2005), previous experiences and the expectations of blogging are also areas which could influence the success of blogging within education but which have not as yet been explored fully. Within this research, the use of blogs as a popular form of Social Media will therefore be explored in an empirical manner.

The rise of blogs and technology within education has coincided with a move within UK and US HE institutions away from the behaviourist traditions of the late 20th Century using instructional and instructional models of teaching (Illeris, 2007; Jonassen & Land, 2000; Sherman, 2006). Institutions are instead starting to adopt models of teaching and learning which utilise constructivist pedagogies. Such pedagogies can be considered to be well supported by the use of Social Media tools such as blogs (Doherty, 2005) but this again needs to be explored in more depth and tested empirically.

Overall it will be important to identify whether the use of blogs within HE teaching and learning will lead to increased perceptions of learning amongst students. If blogs are to be used within education their primary function should be to lead to an increase in the degree of perceived learning students gain. This will therefore be explored further within this study.

Given the gaps identified above from the literature review the contributions of this research study have been identified as follows:

1. Explore the extent to which perceptions of digital technology affect the manner in which students utilise blogs when adopted for teaching and learning purposes within HE.
2. Determine whether perceptions of teaching and learning will affect the manner in which students utilise blogs when adopted for teaching and learning purposes within HE.
3. Explore whether the degree to which the rhythm and socio-technical structure of blogging (reading, writing, commenting in and commenting out) affects the perceived learning of students when using blogs.

4. Consider whether previous experience of using blogs and expectations of the use blogs within education affects the manner in which students will utilize blogs for HE teaching and learning purposes.

5. Explore whether differences in the degree to which rhythm and the socio-technical structure of blogging is used (reading, writing, commenting in and commenting out) affects the learning that is perceived by students to have occurred when using blogs for HE teaching and learning.

6. Determine whether greater use of blogs leads to higher perceived learning amongst students within Higher Education.

7. This research will also create a framework for the use of blogs within HE teaching and learning that can be used and developed further in the future to explore the use of blogs in different context and involving different factors that may influence the use of such technology.

In order to address the contributions identified above a number of research questions will be created and the aim of the research will be clarified. This will now be discussed in more detail.

### 3.2 Research Questions

From the literature reviewed, although currently lacking empirical analysis, it would appear that blogs could support teaching and learning within Higher Education well. It is also apparent however that the degree to which blogs may be useful will be reliant on a number of different factors. These will include an individual’s views on pedagogy, technology and their previous usage of and expectations of use of blogs. This therefore will form the basis of this research and the primary research aim:
To investigate the use of blogs within higher education teaching and learning in relation to the pedagogical position, technological position and blogging expectation and previous experience of students.

The primary research question will consequently be:

1. Does greater use of blogs within teaching and learning lead to higher levels of student perceived learning?

It also appears that there are a number of ways in which students can participate within a blogging community. These different forms of participation are known as the rhythm of blogging and relate to the different activities that students undertake when blogging. Rhythm therefore includes writing, reading and commenting. Currently however there appears to be a lack of understanding of the role of each within the learning process and the ecosystem of blogging that relies on each activity and whether the differing roles students may take will affect the success of their learning.

For the community to exist it will be relevant to consider what Efimova & De Moor (2005) have named the socio-technical context and specifically the rhythm aspect of this model which will encompass reading, writing and commenting. The rhythm aspect is important as this will feature in all models of blog usage and relates to the level of activity that will occur over time. The rhythm will be vital as within a community it will be necessary for the pace of new information to be retained and for the blogs to remain “sticky”. It is not as yet clear from the existing literature whether the rhythm which is formed from the level and pace of interaction within a learning blogging community will affect the success of the community. This will however form the basis of the role that an individual student plays within the community and leads to a secondary research question:

2. Do higher perceived rhythm levels of blogging provide an indication of higher perceived learning levels?
Whilst the rhythm of blogging will be an outcome of a blogging experience it is also necessary to consider the differences between students as they approach using blogs within their studies. Student use is expected to be influenced by a number of different factors. Firstly, we have already seen the concept of Digital Natives and the Web Generation and therefore there is an expectation that students will wish to work using Social Media and blogs and those with a greater degree of digital competence and literacy are expected adopt blogging tools more fully than those who do not. This therefore leads to the research question:

3. Do students who have higher positive perceptions toward digital technology have higher perceived rhythm levels of blogging?

Furthermore, in addition to perceptions of digital technology it is expected that those students who perceive teaching and learning as a constructivist activity as opposed to a behaviourist activity are also likely to embrace the use of tools such as blogs within their learning more fully. This therefore leads to the research question:

4. Do students who perceive teaching and learning as a constructivist activity have higher perceived rhythm of blogging?

Finally, one further area that arises from the literature review undertaken is the effect of the views of others, such as teachers, on student expectations and experiences. It is clear from the literature review that there are a range of different levels of acceptance of Social Media and blog usage amongst both teachers and students. Therefore, it is also important to seek to discover whether students are affected by previous usage and expectations. Two further research questions therefore emerge. These are:

5. Do positive perceptions of previous experience of blog usage indicate higher rhythm of blogging activity?
6. Do positive expectations of blogging indicate higher perceived rhythm of blogging activity?

Within this section, the contribution to knowledge and the research questions for this study have been discussed. In order to operationalise this study a research model and a number of hypotheses for the research will be created. The creation of the research model and the development of the hypotheses are discussed in the next section.

3.3 The Research Model and Hypotheses Development

Within the literature review presented in Chapter 2, a number of research gaps have been identified that will be addressed through this study. In order to address the gaps in existing research this study will seek to develop a research framework for the use of blogs within teaching and learning within UK and US Higher Education. This model will seek to address the research questions outlined in Section 2.8. Each research question, the development of the research model and the development of hypotheses will now be discussed in more detail.

3.3.1 The Greater Use of Blogs within Teaching and Learning

The first research question within this study asks whether the greater use of blogs leads to higher levels of student perceived learning. In order to explore this, question a research framework is developed as presented in Figure 3.1. This research model has been informed by the existing literature related to this topic as discussed in Chapter 2. It is important to note from the literature reviewed in Chapter 2 that an existing model of student blogging for teaching and learning and its links to perceived learning does not currently exist. This therefore has required the development of a new model, which seeks to address this question and is shown in Figure 3.1.
Figure 3.1 Conceptual Framework for Student Blog Use
From the literature review, it would appear that there are a number of key variables that can be considered to influence and impact upon the ways in which blogs will be used by students for teaching and learning. These include perceptions of digital technology (Rosen, 2010, 2011; Rosen et al, 2013; Oblinger & Oblinger, 2005; Prensky, 2001b, 2010, 2012), perceptions of teaching and learning (Chan & Elliott, 2002), perceptions of previous experience (Halic et al, 2010) and expectations of blogging (Efimova & De Moor, 2005). These are therefore identified as variables on the left-hand side of the model in figure 3.1. Each of these variables will be discussed in more detail below (Sections 3.3.3-3.3.6).

In order to assess the degree to which these variables impact upon the use of blogs the relationship between the variables identified above and the rhythm of blogging will be considered. Each of these areas relate to an additional research question (research questions 3-5). The rhythm of blogging has been developed from part of the socio-technical structure developed by Efimova & De Moor (2005) and the blogging model created by Deng & Yuen (2011). As each of these activities represent different forms of interaction within blogs as well as different ways of learning each of these will be considered separately within the model as individual variables. These variables are shown within the middle part of the model shown in figure 3.1 and will be discussed in more detail below (Section 3.3.2).

The final part of this model will consider the outcome of the blogging activity when blogs are used for teaching and learning, perceived learning. The relationship between the various activities of blogging (reading, writing, commenting in and commenting out) and perceived learning will allow for an assessment of the perceived effectiveness of blogs for teaching and learning to be made. This element of the model will therefore seek to answer research question 2. Perceived learning is shown within the right-hand of the model in figure 3.1 and will be discussed further below (Section 3.3.7).
As discussed at the beginning of this section the overall model created in figure 3.1 will seek to address research question number 6 and the following hypothesis shall be answered:

- **H6** - Greater use of blogs leads to higher level of student perceived learning

In order to ensure a full understanding of each of different variables identified within the overall model each of the additional research questions and parts of the research model shall now be discussed in more detail. The hypotheses developed for each area shall also be discussed further.

3.3.2 Rhythm of Blogging

The first area that needs to be considered is the rhythm of blogging. The rhythm of blogging is identified by Deng & Yuen (2011) and Efimova & De Moor (2005) and will consist of writing, reading, commenting in and commenting out. These activities are considered to be necessary in order to allow a web conversation to take place.

Within blogging writing refers to the way in which an individual will write a post for their own blog. Writing is therefore the process of creating posts for a blog and can include the use of figures, tables and images to support the post. It is also important to be aware that writing can be a collaborative activity and posts can also be written by a number of different individuals within a single blog. Rhythm of writing therefore refers to how often an individual writes a post that contributes to a blog.

In the context of rhythm reading refers to the way in which an individual will read in relation to blogs. Reading may relate to both comments and posts and can also relate to their own or the blogs of others. Rhythm of reading therefore refers to how often an individual reads the posts and comments of others within blogs.
In the context of rhythm commenting refers to the process of comments being left on a blog. Efimova & De Moor (2005) further distinguishes between commenting in terms of commenting and in and commenting out. Commenting in relates to the process of others leaving comments on the blog of an individual. A comment in is therefore a comment left about a post that has been written or further adds to the comments of others in relation to a post on the blog of an individual. Comments in in other words can be considered to be feedback for an individual about their blog.

Commenting out in contrast refers to the activity of an individual commenting on the blog posts of others. In order to comment out an individual will therefore be expected to read the blog posts of others and to respond to these posts by writing a comment as some form of feedback.

By considering the rhythm of blogging it will be possible within this model to establish the participation of students during the blogging activity and also to distinguish between the different types of activities that are taking place.

Within the research model shown in figure 3.1 the various aspects of blogging rhythm will each be examined and the relationships between these and the other variables within the model will be explored. Each of these relationships will be discussed in more detail below.

3.3.3 Perceptions of Digital Technology

The literature review in Chapter Two has discussed the manner in which students are now considered to be members of the Web Generation (Rosen, 2010, 2011; Rosen et al, 2013), the Net Generation (Oblinger & Oblinger, 2005) and Digital Natives (Prensky, 2001b, 2010, 2012). This has led to an assumption that students are digitally literate, always connected, desiring an immediate response, experiential, social, visual and craving interactivity (Oblinger & Oblinger, 2005). It has also led to the belief that students today want technology and Social Media to be present within every aspect of their
lives (Beetham & Sharp, 207; Philip, 2007). This is therefore considered to have implications for the way in which students interact with and use blogs for teaching and learning. This is not however a view that is shared by all commentators (Owen, 2004; Margaryan, 2008; Bennett, 2008). In order to determine therefore whether student perceptions of digital technology do impact on the way in which they use blogs this construct is tested within the research model. This construct will therefore consider the degree to which students consider themselves to be digitally literate and immersed in digital technology within their everyday lives. This construct will be tested in relation to rhythm in order to determine the following hypothesis:

- **H1.** Positive perceptions towards digital technology results in higher perceived rhythm of blogging activity

As previously discussed in section 3.3.2 the rhythm of blogging will be formed of four different areas (writing, reading, commenting in and commenting out). The influence of perceptions of digital technology will therefore be considered in relation to these four forms of blogging rhythm and therefore the following four hypotheses are also required:

- **H1a** - Positive perceptions towards digital technology results in higher writing rhythm of blogging activity.

- **H1b** - Positive perceptions towards digital technology results in higher reading rhythm of blogging activity.

- **H1c** - Positive perceptions towards digital technology results in higher commenting in rhythm of blogging activity.

- **H1d** - Positive perceptions towards digital technology results in higher commenting out rhythm of blogging activity.
In order to measure the perceptions of students towards digital technologies three different aspects of digital perceptions will be explored. Firstly, the positive attitudes of students towards digital technologies will be measured using a scale previously utilized by Rosen (2010). Next in order to gain an understanding of the positive experiences students have had towards digital technologies a scale created by Morse et al (2010) will be utilized. Finally, the use of technology for learning will be examined through the inclusion of a scale developed by Liaw et al (2002). By using these three different elements together it is anticipated that a thorough understanding of students’ perceptions of digital technologies within all aspects of their lives will be gained. The relationship between perceptions of digital technology and rhythm of blogging will then be examined.

3.3.4 Perceptions of Teaching and Learning

The literature review presented in Chapter 2 has outlined, in some detail, the different approaches to pedagogy that exist within HE teaching and learning today. We have seen there are a number of different approaches to teaching and learning including behaviourist theories (Margaryan & Littlejohn, 2008), cognitive development theory (Ormrod, 2003), social learning theory (Bandura, 1977), social constructivism (Vygotsky, 1978) and situated learning and communities of practice (Lave & Wenger, 1991). Largely we have seen that these approaches to learning appear to be based either on traditional instructionalist or behaviourist beliefs or on constructivist beliefs and that these beliefs can fundamentally affect how we perceive teaching and learning to best occur particularly in relation to the use of blogs. Within the model shown within figure 3.1 the perceptions of students towards teaching and learning shall be considered. This variable will be based on a scale developed by Chan & Elliott (2002) in which a number of questions are asked to ascertain the degree to which an individual consider teaching and learning to be a constructivist or behaviourist activity. The following hypothesis will therefore be formed:
**H2** - Greater perceptions of teaching and learning as a constructivist activity results in higher perceived rhythm of blogging activity

In order to explore the relationship between perceptions of teaching and learning and the rhythm of blogging (reading, writing, commenting in and commenting out) the following sub-hypotheses will also be considered:

**H2a** - Greater perceptions of teaching and learning as a constructivist activity results in higher writing rhythm of blogging activity.

**H2b** - Greater perceptions of teaching and learning as a constructivist activity results in higher reading rhythm of blogging activity.

**H2c** - Greater perceptions of teaching and learning as a constructivist activity results in higher commenting in rhythm of blogging activity Commenting In

**H2d** - Greater perceptions of teaching and learning as a constructivist activity results in higher commenting out rhythms of blogging activity.

### 3.3.5 Perceptions of Previous Experience

Within the literature review presented in Chapter 2 another important variable identified is perceptions of previous blogging experience. Perceptions of previous experience are considered to be important, as perceptions of previous experience are likely to lead to a positive or negative view of the use of blogs and therefore are expected to influence the expected effort and desire for usage in the future. Previous experience can be affected by a number of different influences and can include whether previous teachers have been open to digital technology or not. Previous research has provided indications that blogging can provide both a positive (Kerawalla et al, 2008; Nguyen, 2006, Instone, 2005, Halic et al, 2010; Lai & Chen, 2010) and negative experience (Top, 2011; Macduff, 2009; Archer, 2000; Garrison, Anderson & Archer, 2000).
In order to assess perceptions of previous experience with blogs a scale created by Halic et al (2010) will be adopted. The following hypothesis will be considered in relation to previous experience:

**H3** - Positive perceptions of previous experience of blog usage indicate higher perceived rhythm of blogging activity.

As we have already discussed in relation to the previous variables. In order to explore the relationship between perceptions of previous blogging experience and the rhythm of blogging (reading, writing, commenting in and commenting out) the following sub-hypotheses will also be considered:

**H3a** - Positive perceptions of previous experience of blog usage indicate higher writing rhythm of blogging activity.

**H3b** - Positive perceptions of previous experience of blog usage indicate higher reading rhythm of blogging activity.

**H3c** - Positive perceptions of previous experience of blog usage indicate higher commenting in rhythm of blogging activity.

**H3d** - Positive perceptions of previous experience of blog usage indicate higher commenting out rhythm of blogging activity.

### 3.3.6 Expectations of Blogging

In the literature review presented in Chapter Two the expectations of blogging can be seen to be an important variable to emerge in relation to HE student use of blogs for teaching and learning. In the literature review the importance of students being receptive to the use of blogs within their studies was evident (Leslie & Murphy, 2008; Sun, 2010; Fullwood, Sheehan & Nicholls, 2009; Macduff, 2009; Suarez, 2007). Within the literature, the manner in which HE
teachers can affect the way in which students perceive the usefulness and relevance of blogs to their studies was also discussed and this can be seen to be both a positive or a negative influence (Andergassen et al, 2009; Richardson, 2010; Churchill, 2009; Allan, 2007).

From the literature review it is therefore clear that student expectations of blogging can be wide and varied and the impact that these expectations will have on the use of blogs for HE teaching and learning should be explored. In order to consider expectations of blogging within this model this variable will be tested using a scale developed by Efimova & De Moor (2005) that consider expectations of blogging. The following hypothesis shall therefore be considered:

**H4.** Positive expectations of blogging indicate higher perceived rhythm of blogging activity.

Again, in relation to this variable the relationship between expectations of blogging and the rhythm of blogging in relation to the different aspects of blogging activity (reading, writing, commenting in and commenting out) shall result in the creation of the following sub-hypotheses:

**H4a** - Positive expectations of blogging indicate higher writing rhythm of blogging activity.

**H4b** - Positive expectations of blogging indicate higher reading rhythm of blogging activity.

**H4c** - Positive expectations of blogging indicate higher commenting in rhythm of blogging activity.

**H4d** - Positive expectations of blogging indicate higher commenting out rhythm of blogging activity.
3.3.7 Perceived Learning

The final area identified from the literature review (Chapter 2) that shall be included within the research model is perceived learning. When blogs are used for the purposes of HE teaching and learning one of the key objectives will be to increase the degree of learning students achieve during the activity. Due to the focus of this research on student use of blogging, perceived learning will be measured in order to assess the value students consider they can gain from the use of blogs. In order to measure this variable a scale for learning with blogs by Halic et al (2010) will be utilized. The following hypothesis will therefore be formed:

\[ H_5 \]. Higher blogging rhythm results in a higher perception of individual learning through the use of blogging.

In order to assess whether there are particular activities within blogging that lead to higher levels of perceived learning the relationships between the different aspects of blogging rhythm and perceived learning will also be explored. It is important to consider the links between rhythm and perceived learning as greater rhythm is an indication of greater blog use and therefore if blogs are a good tool for students to learn perceived learning should increase as a result of higher rhythm of use. The following hypotheses are therefore considered also:

\[ H_{5a} \] Higher writing rhythm results in a higher perception of individual learning through the use of blogging.

\[ H_{5b} \] Higher reading rhythm results in a higher perception of individual learning through the use of blogging.

\[ H_{5c} \] Higher commenting in rhythm results in a higher perception of individual learning through the use of blogging.
**H5d** Higher commenting out rhythm results in a higher perception of individual learning through the use of blogging.

As each of the areas of the research model have now been discussed in detail the overall hypotheses are provided within Table 3.1. The hypotheses are presented within this table alongside the related sub-hypotheses and research questions.
Table 3.1 Research Hypotheses

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Hypothesis</th>
<th>Sub-Hypothesis</th>
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<tbody>
<tr>
<td><strong>R1.</strong> Does greater use of blogs within teaching and learning lead to higher levels of student perceived learning?</td>
<td><strong>H6.</strong> Greater use of blogs leads to higher level of student perceived learning</td>
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</tr>
</tbody>
</table>
| **R2.** Do higher perceived rhythm levels of blogging provide an indication of higher perceived learning levels? | **H5.** Higher blogging rhythm results in a higher perception of individual learning through the use of blogging | **H5a** Higher writing rhythm results in a higher perception of individual learning through the use of blogging.  
**H5b** Higher reading rhythm results in a higher perception of individual learning through the use of blogging.  
**H5c** Higher commenting in rhythm results in a higher perception of individual learning through the use of blogging.  
**H5d** Higher commenting out rhythm results in a higher perception of individual learning through the use of blogging. |
| **R3.** Do students who have higher positive perceptions toward digital technology have higher perceived | **H1.** Positive perceptions towards digital technology results in higher perceived rhythm | **H1a** Positive perceptions towards digital technology results in higher writing rhythm of blogging activity.  
**H1b** Positive perceptions towards digital technology results in higher reading rhythm of blogging activity. |
<p>| R4. Do students who perceive teaching and learning as a constructivist activity have higher perceived rhythm of blogging? | ( H2. ) Greater perceptions of teaching and learning as a constructivist activity results in higher perceived rhythm of blogging activity. | ( H2a ) Greater perceptions of teaching and learning as a constructivist activity results in higher writing rhythm of blogging activity. ( H2b ) Greater perceptions of teaching and learning as a constructivist activity results in higher reading rhythm of blogging activity. ( H2c ) Greater perceptions of teaching and learning as a constructivist activity results in higher commenting in rhythm of blogging activity. ( H2d ) Greater perceptions of teaching and learning as a constructivist activity results in higher commenting out rhythms of blogging activity. |
| R5. Do positive perceptions of previous experience of blog usage indicate higher rhythm of blogging activity? | ( H3. ) Positive perceptions of previous experience of blog usage indicate higher perceived rhythm of blogging activity. | ( H3a ) Positive perceptions of previous experience of blog usage indicate higher writing rhythm of blogging activity. ( H3b ) Positive perceptions of previous experience of blog usage indicate higher reading rhythm of blogging activity. ( H3c ) Positive perceptions of previous experience of blog usage indicate higher commenting in rhythm of blogging activity. |</p>
<table>
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<tr>
<th>R6. Do positive expectations of blogging indicate higher perceived rhythm of blogging activity?</th>
<th><strong>H4.</strong> Positive expectations of blogging indicate higher perceived rhythm of blogging activity.</th>
<th><strong>H3d</strong> Positive perceptions of previous experience of blog usage indicate higher commenting out rhythm of blogging activity.</th>
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<tbody>
<tr>
<td><strong>H4a</strong> Positive expectations of blogging indicate higher writing rhythm of blogging activity.</td>
<td><strong>H4b</strong> Positive expectations of blogging indicate higher reading rhythm of blogging activity.</td>
<td><strong>H4c</strong> Positive expectations of blogging indicate higher commenting in rhythm of blogging activity.</td>
</tr>
<tr>
<td><strong>H4d</strong> Positive expectations of blogging indicate higher commenting out rhythm of blogging activity.</td>
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The hypotheses outlined will be tested within the context of both the UK and the US. A comparison between the two countries will be made however if there are not significant differences between the two contexts and the results will be analysed as one dataset.

3.4 Chapter Summary

Within this chapter, the research gaps and contribution to knowledge, research questions, research hypotheses and research model have been outlined and discussed. Now an understanding of the purpose and nature of this research has been considered the manner in which this research will be undertaken shall be discussed. The next chapter of this thesis will therefore discuss the research methodology and research methods adopted for this study.
4. Research Methodology and Methods

This chapter will explore the philosophical assumptions, paradigm of inquiry and research methodology that will be employed within this study. In addition to this, this chapter will consider the data collection method, research instruments, the research variables and the techniques that will be used to analysis the data collected.

4.1 Philosophical Assumptions

Before research is conducted it is important to consider not only the strategy and research tools that will be used in order to undertake the research but also the underlying philosophical principles that will determine the way in the research is conducted. This section therefore considers the research philosophy, the paradigm of inquiry and the research approach that will be adopted within this study.

4.2 Research Philosophy

The research philosophy is considered to be an important definition as it is concerned with the way in which a researcher views the world and the assumptions the researcher makes that will underpin the choice of research strategy and methods that are chosen (Saunders, Lewis & Thornhill, 2009).

The research philosophy chosen is considered to be of high importance to any research project as the manner in which knowledge is viewed lives at the heart of the research process and forms the basis of the way in which the researcher shall view the world around them and therefore the issues under investigation (Saunders, Lewis & Thornhill, 2009). There are generally considered to be two main research philosophies that are known as positivist and phenomenological (Collis & Hussey, 2009).
Positivism is the research paradigm that is most often associated with the natural sciences (Collis & Hussey, 2009; Saunders, Lewis & Thornhill, 2009). This is due to the manner in which reality is considered to be independent, objective and value free and therefore will not be affected by the process of research and furthermore will exist independently of the researcher (Collis & Hussey, 2009). In part as a response to these criticisms the phenomenological paradigm was formed and shall now be outlined in more detail.

The phenomenological paradigm is formed from the belief that social reality is not an objective entity but rather is something which is formed in our minds and shaped by our perceptions and therefore is socially constructed (Collis & Hussey, 2009). In this paradigm, the importance of understanding human behaviour in terms of participants’ own frames of reference are considered important (Collis & Hussey, 2009). The basis of this approach therefore has consequences for the manner in which research is conducted for not only is reality considered subjective and therefore does not exist as a single entity but also it is necessary for the researcher to interact with the phenomenon being researched as it is impossible to separate the phenomenon from the researcher’s reality which is itself a subjective creation.

It is important to note also that in this approach the researcher is considered to have values that will shape the manner in which knowledge is formed and created even where these values are not made explicit. This paradigm however has come under increasing criticism within social research areas as it is claimed that this perspective ignores the social context within which individuals act, not least the researcher and this can therefore be considered to influence the way in which individuals will behave.

This study seeks to investigate the degree to which blogs can be used for teaching and learning within Higher Education. As this study seeks to determine the causal relationships between different factors and the degree of learning that occurs the study will be undertaken from a positivist philosophical position. This study is also suited to a positivist philosophical
position as it seeks to establish a theoretical model and to test this rather than to allow an emergent theory to be developed (Cohen, Manion & Morrison, 2015).

A further dimension to this research is the manner in which the researcher aims to remain objective and will not apply their own values or interests to the research findings (Collis & Hussey, 2009).

As the research philosophy for this study has now been clarified it will be necessary to consider the paradigm of inquiry that will be adopted within this study.

4.3 Paradigm of Inquiry

There are two main terms that need to be considered in relation to the paradigm of inquiry, these are epistemology and ontology (Creswell, 2009).

Epistemology refers to a part of philosophy that is concerned with the nature of knowledge and therefore what can be referred to as acceptable or valid knowledge (Saunders, Lewis & Thornhill, 2009). The epistemological perspective therefore requires a review of the relationship that exists between the researcher and the area that is being researched. In addition to epistemology the term ontology further builds on this concept by additionally being concerned with the nature of reality (Saunders, Lewis & Thornhill, 2009).

Within the social sciences there are four major philosophical paradigms. These are post-positivism, advocacy / participatory, pragmatism and social constructivism (Creswell, 2009). Post-positivism is generally considered to be the traditional research paradigm. This paradigm is usually more quantitative than qualitative (Creswell, 2009) whilst the advocacy / participatory and social constructive paradigms are usually more qualitative than quantitative (Creswell, 2009). The pragmatism paradigm meanwhile is not closely aligned to qualitative or quantitative methods (Creswell, 2009).
This research adopts a post-positivism approach. This approach assumes a deterministic philosophy and this results in the assumptions that causes probably determine effects or outcomes (Creswell, 2009). A post-positivist approach is also reductionistic and therefore seeks to reduce ideas into small and discrete sets of ideas that can be tested using hypotheses and research questions (Creswell, 2009).

A post-positivism approach also assumes that knowledge can be developed based on observation and measurement of an objective reality that exists in the world. Furthermore, post-positivism assumes that there are laws or theories that govern the world and which need to be tested and verified in order to understand the world (Creswell, 2009).

Within this research, the ontological position to be adopted is critical realism. Critical realism assumes that reality can only be understood imperfectly and probabilistically as human factors impede its full understanding (Guba & Lincoln, 1994). In this research, reality is considered to be external to the researcher and therefore can be observed and objectively measured through the operationalization of the factors affecting learning when using blogs within teaching and learning. Whilst this is the case it is also accepted that this reality cannot be fully understood in a positive form as the research recognises the effect of student perceptions of different factors on the use of blogs within teaching and learning. These effects come from using Likert scales, which are based on student perceptions and therefore justifies the critical realism ontology.

In terms of the epistemological position it is accepted that the researcher and the topic of this study are not completely separate, as the researcher has already developed pre-existing knowledge from the review of literature. The objectivity of the study can still be considered due to the quantitative measurement of the study’s variables.
4.4 Research Approach

When undertaking research there are two approaches that can be adopted. These are known as deductive and inductive. A deductive approach is one in which a conceptual and theoretical structure is developed and tested using a hypothesis (Bryman, 2003). The deductive approach therefore uses hypotheses in order to explain causal relationships amongst variables. When using a deductive approach, it is most common that quantitative methods will be used (Saunders, Lewis & Thornhill, 2009). Deductive approaches consider that theory is the first source of knowledge and therefore, considered as a linear model process, deduction will develop from theory to empirical investigation (Eriksson & Kovalainen, 2008). An inductive approach meanwhile is used when theory is being built. In inductive approaches data, will first be collected in order to understand the nature of the phenomenon being investigated (Saunders et al., 2009). Also, when undertaking an inductive approach researchers will consider that theory will result from empirical research rather than the other way around. In an inductive approach a researcher will therefore start from the basis of empirical evidence and will seek to develop theoretical findings from this (Eriksson & Kovalainen, 2008).

Saunders, Lewis & Thornhill (2009) argue that the main difference between the inductive and deductive approaches are that the inductive approach explores why a phenomenon is happening whilst a deductive approach seeks to explain what is happening. Within the social sciences, it is generally agreed that the deductive approach is the more popular way in which to develop a theoretical knowledge base (Eriksson & Kovalainen, 2008).

Within this study, a deductive approach will be utilised. A deductive approach is considered most appropriate in this case due to the way in which this study seeks to determine the relationships between different factors. A deductive approach therefore will best meet the aims of this research study which seeks to establish whether theory and literature can be supported through empirical testing of a research model. A deductive approach is also considered to be
most appropriate in this case as hypothesis have been established and a theoretical framework will be tested.

Within this field, the majority of work is currently subjective or very small scale. It is therefore anticipated that a deductive approach will provide a solid methodological basis for this research study. Within this study, a number of different theories will be used to explore the nature of teaching and learning within HE. These have been outlined fully within Chapter 3 where the conceptual framework and hypotheses development has been discussed.

4.5 Research Methodology

Research methodology refers to the overall approach that is taken to the research process, from a theoretical basis to the collection and analysis of data (Collis & Hussey, 2009). Within research there are a wide number of methodologies that can be adopted which utilise a wide range of research methods (Collis & Hussey, 2009). Within this study, a survey methodology is employed. Collis & Hussey (2009) define a survey methodology as a positivist methodology in which a sample of subjects are taken from a population and then studied in order that inferences can be made about the population. The survey methodology reflects the post-positivism approach well particularly in the case of an analytical survey in which relationships are identified between different variables (Collis & Hussey, 2009). The use of the survey method will also allow the research questions within this study to be answered most effectively. A survey will allow the collection of a wide range of data that can be used to test the hypotheses created and for the relationships established between constructs to be tested.

4.6 Research Design

In relation to research design Saunders, Lewis & Thornhill, (2009) indicate that research design will either be mono method or multiple methods. If a mono method is used a study will either be quantitative or qualitative. If multiple methods are used this can be further defined as either a multi-method
approach, which will result in a multi-method quantitative study or a multi-
method qualitative study or a mixed methods approach which will result in
mixed model research or mixed method research (Saunders, Lewis &
Thornhill, 2009).

Within this research, a quantitative study will be undertaken. This research
design will be in keeping with the post-positivist paradigm previously
discussed and will allow the researcher to observe and measure the studied
phenomenon whilst still allowing for the perceptions and attitudes of individual
participants. As this research is seeking to determine the perceptions of
individual participants in a number of areas and to establish the relationships
between different factors this approach will be most appropriate for this
research. Using quantitative methods will also allow the collection of data from
a wide range of participants and for analysis to be undertaken relatively
easily.

4.7 The Use of the Survey Method

Whilst surveys can be collected in a number of different ways including postal
surveys, telephone interviews and face-to-face interviews (Collis & Hussey,
2009) in this study, online questionnaires are used to collect survey data.
Telephone interviews and face-to-face interviews would not have been viable
due to the time and costs that would have been associated with undertaking
data collection in this way (Saunders, Lewis & Thornhill, 2009). Whilst postal
surveys could have been used it is suggested that there is little statistical
difference between postal and online surveys in terms of data quality and
missing items (McDonald & Adams, 2003). Online surveys are also
considered to have a greater ease of distribution, quick response time, a
greater cost effectiveness and relative quick return rate (Wright, 2005).

Initially responses were sought using contacts within the Higher Education
sector. This however resulted in no responses to the survey therefore in order
to collect data for this research an audience panel from
www.smartsurvey.com was utilised. Smart Survey was chosen as provider
due to its ability to offer the required audience. Qualtrics and SurveyMonkey were investigated but were unable to provide the required panel with relevant disqualification options. Smart Survey provides online survey services to a range of organisations and individuals. Some of their business clients include the BBC, NHS and Vodafone amongst others. Some of their higher education clients such as University of Brighton, University of Cambridge and Plymouth University amongst others (Smart Survey, 2016a). Smart Survey has a potential audience panel of over 20 million who can be targeted by a range of criteria (Smart Survey, 2016b).

There are advantages and disadvantages of using an audience panel. Advantages include that panels are convenient, quick and have high response rates (Mcree, 2015). Panels are also advantageous where research will be difficult or expensive to undertake, where customised samples are required and where demographically representative samples are sought (Pollard, 2003). Disadvantages of panels include that data quality can be affected as respondents are incentivised and there may be panel selection bias (Lohse et al, 2000). Increasingly audience panels are being used within research in order to allow the collection of data in a quick and convenient way (Redd & Wu, 2016; Schoenherr, Ellram & Tate, 2015; Vakhitova & Reynold, 2014).

Questionnaire responses were analysed through the Partial Least Square Structural Equation Modelling (PLS-SEM) technique that allowed the hypotheses outlined in the research to be supported or rejected. The questionnaire survey explores the perceptions of students using blogs and their views relating to the factors identified within the research questions.

**4.8 Survey Population and Sampling**

Within this study, responses to the survey were sought from students who were undertaking (or who had undertaken) a Higher Education course and who had used blogs as part of their formal studies. Participants were targeted within the UK and US. The reasons for the selection of respondents from the UK and US have previously been discussed in Section 1.1. According to data
from HESA (2016) there were 2.38 million students studying for a HE qualification in 2012/2013. According to the NCES (2016) there were 17.3 million students studying for a HE qualification within the US. The total population for this research is therefore 19.68 million.

From Smart Survey's audience panel the criteria required that respondents must be students from either the UK or US undertaking Higher Education courses. A total of 4010 respondents within the UK and 8643 met the criteria within the US. From these totals, only those students who responded appropriately to a qualifying question would be asked to complete the survey. A total of 600 responses were commissioned from Smart Survey with 300 respondents from the UK and 300 respondents from the US. This number was the maximum that could be targeted from funding available from both the University of Plymouth and via self-funding but exceeds the number of responses required for statistical significance within PLS-SEM (See Section 4.15). As a result of the use of a panel the sampling approach for this research was non-probability sampling (Mckee, 2015).

4.9 Data Collection Protocol

In order to ensure a full understanding of the methods of data collection for this study the following section discusses the procedures followed in order to utilise the online survey method. By considering the data collection procedures in more detail, it is possible to also gain a better understanding of problems such as non-response and common method biases (McDonald & Adams, 2003). It is important to note that the data collection was preceded by a pilot study the details of which are discussed in more detail in Section 4.15.

4.9.1 Online Questionnaire

The use of an online questionnaire for this study was considered to be particularly relevant given that this study focuses on the use of blogs within teaching and learning. As the sample also covered both the UK and the US
the use of online questionnaires provided a simple and effective way of collecting data for this study.

4.10 Survey Constraints

Within any research method there are likely to be constraints that will impact upon the study. In this study, there were two main constraints. The first was time and the second was cost.

4.10.1 Time

Within the majority of studies, it is of importance in order to complete research within a timely manner. Whilst respondents were initially sought via Higher Education contacts the lack of response led to the use of a panel. One of the benefits of a survey panel is the speed with which responses can be obtained. Once the survey had been created using Smart Survey the survey was opened and closed after 5 days once quotas had been reached.

4.10.2 Cost

Cost is an important factor to consider when undertaking a survey. As a consumer panel was required in order to undertake this research costs were incurred. The cost of collecting survey responses in this research were covered by funding granted by the University of Plymouth Business School and by the individual researcher.

4.11 The Survey’s Design

Within this survey, the questions were close-ended with a set number of possible responses (Collis & Hussey, 2009). One of the benefits of this approach to data collection is the manner in which coding, tabulation and the interpretation of data can be made (Collis & Hussey, 2009). In order to measure responses a Likert scale was used. A Likert scale allows
respondents to express their views on a scale ranging from negative to positive responses and is a popular tool for use within research surveys.

Whilst Likert scales can use a range of points including five, seven and ten point scales, in this research a five point Likert scale was used for all but one section. In the final section of the survey a six-point Likert scale was used as this had been previously used within other studies using this survey instrument (Halic et al, 2010; Top, 2012; Asoodar et al, 2014). This has the benefit of providing a consistent approach to the survey and enable participants to easily understand how to complete the survey. The survey was divided into seven sections, one of which is a classification section as shown in Table 4.1.

Table 4.1: The Questionnaire Structure

<table>
<thead>
<tr>
<th>Section</th>
<th>Variable(s) to be measured</th>
<th>Type of question</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – Perceptions of Digital Technologies</td>
<td>Independent Variable</td>
<td>Close-ended with 5-point Likert</td>
</tr>
<tr>
<td>B – Perceptions of Teaching and Learning</td>
<td>Independent Variable</td>
<td>Close-ended with 5-point Likert</td>
</tr>
<tr>
<td>C – Previous Blogging Experience</td>
<td>Independent Variable</td>
<td>Close-ended with 5-point Likert</td>
</tr>
<tr>
<td>D – Expectations of Blogging</td>
<td>Independent Variable</td>
<td>Close-ended with 5-point Likert</td>
</tr>
<tr>
<td>E – Rhythm of Blogging</td>
<td>Dependent Variable</td>
<td>Close-ended with 5-point Likert</td>
</tr>
<tr>
<td>F – Perceived Learning</td>
<td>Dependent Variable</td>
<td>Close-ended with 6-point Likert</td>
</tr>
<tr>
<td>G - Classification</td>
<td>N/A</td>
<td>Close-ended with multiple Options and Open Responses</td>
</tr>
</tbody>
</table>

The first section of the questionnaire seeks to determine participants’ perceptions of digital technologies. This section consists of 12 items, 8 of which seek to determine respondents’ general views towards digital technologies and 4 of which seek to determine respondents’ views towards educational technologies. This section therefore allows the researcher to measure the independent variable of the study that considers the view of
participants towards digital technologies in general life and education. All questions within this section were close-ended with five-point Likert scales.

The second section of the questionnaire seeks to determine participants’ perceptions of teaching and learning. Within this section 18 items seek to determine respondents’ views of teaching and learning as a traditional or constructivist activity. The statements within this section are phrased to provide a positive score from respondents’ who have a more traditional view of teaching and learning and a lower score from those who perceive teaching and learning as a constructivist activity. All questions within this section were close-ended with five-point Likert scales.

Section C and D of the questionnaire seek to determine participants’ perceptions of blogging. Section C looks at previous blogging experience in relation to their studies whilst Section D considers the expectations participants have of blogging for educational purposes. Section C consists of 9 items all of which were based on close-ended statements with five-point Likert scales. Section D meanwhile has 12 questions. Within both sections all questions are based on close-ended five-point Likert scales.

Section E and F of the survey consider the blogging practices of students. Within Section E there are 8 items. This section considers the rhythm of blogging which relate to the different activities involved in blogging; reading, writing and commenting in and out. Meanwhile Section F seeks to establish the degree of learning respondents perceived has occurred as a result of blogging. Within this section there are 5 questions. Within Section E items are based on a five-point Likert scale whilst Section F is based on a six-point Likert scale due to its use in previous studies.

The final section of the questionnaire, Section G, sought to establish some classification questions relating to the participants such as their area of study and gender. The final version of the questionnaire is available within Appendix A.
4.12 Research Ethics

When undertaking a research study there are a number of ethical considerations that need to be taken into account. These considerations protect both the researcher and the subjects of the research (Myers, 2013). Research ethics are useful for a researcher as they provide an indication of what is and is not permissible when undertaking research (Kalof, Dan & Dietz, 2008).

Research ethics are defined by Saunders, Lewis & Thornhill. (2009) as the adoption of appropriate behaviour in relation to the rights of individuals or groups being studied or affected by the research study. McNabb (2013) has identified four different issues that should be taken into account when undertaking a research study in order to help ensure research is conducted in an ethical manner. These four issues should be taken into account at each stage of the research process and include truthfulness, thoroughness, objectivity and relevance.

Truthfulness indicates that researchers must not lie, deceive or use fraud. Thoroughness relates to the manner in which the researcher should be thorough in the research process and should not use shortcuts. Objectivity indicates that the researcher should not be biased which is particularly important within positivistic studies. Finally, relevance considers that research should be conducted in a purposeful way which is relevant to literature.

Within this research study every effort has been made to ensure that research has been conducted in an ethical manner following these ideals. Literature has for example been extensively reviewed and gaps within the literature have been identified and purposeful research questions have been developed.

In communicating and publishing findings ethical principles have also been considered. The privacy and anonymity of participants has been ensured in order to maintain participants’ confidentiality (McNabb, 2013; Kalof, Dan & Dietz, 2008). Participants could not be identified from the published findings.
and participants’ general characteristics have been discussed rather than their identity (McNabb, 2013). To further ensure the privacy of participants any identifying information about the participants was removed from research records and reports. All ethical considerations were detailed within the covering page of the questionnaire and all participants needed to accept these before completing the questionnaire.

Another aspect of ethical research is the concept of informed consent. Informed consent requires that participants should be informed of the purpose of the research and their agreement to participate should be voluntarily given (Collis & Hussey, 2003). In this research study the purpose of the study, the risks and benefits of participation and the voluntary nature of taking part in the research were all explained fully to participants in both the pre-testing and full study stages of the research (Kalof, Dan & Dietz, 2008; Myers, 2013).

Within this research, the researcher has acknowledged the limitations and restrictions of the study and this has enabled readers to understand how much credibility can be given to the research (McNabb, 2013).

Overall when considering ethical behaviour within research Saunders, Lewis & Thornhill (2009) consider that the most important issue is to avoid any harm. This was very carefully considered by the researcher within this research study and clear, explicit and precise instructions were provided to participants highlighting all of the ethical aspects outlined above.

4.13 Measurement Variables

As the research methods, have now been discussed it is necessary to consider the instruments that are chosen to measure the variables investigated within this research study. Within Section 3.4 the research model for this study has been discussed and the constructs that will be explored within the research have been identified. The research constructs are provided again in Figure 4.1.

Figure 4.1: Research Constructs
4.13.1 The Independent Variables

Within this study there were four independent variables that were measured. Each of these shall be discussed in more detail below commencing with perceptions of digital technology.

4.13.1.1 Perceptions of Digital Technology (PDT)

Perceptions of digital technology (PDT) is an independent variable which was created by combining a set of items used within previous studies (Rosen, 2010; Morse et al. 2010; Liaw et al. 2002). Within this construct items from different instruments have been combined due to the different areas of perception relating to digital technology that have been identified in previous studies. Within this construct, areas of positive attitudes, positive experience and technology for learning are all explored in relation to perceptions of digital technology. The respondents were asked to respond to each statement shown in Table 4.2 using a five-point Likert scale ranging from “Strongly agree” to “Strongly Disagree”. The aim of the items within this section was to provide an indication of the respondents’ general perceptions of digital technologies as well as their view digital technologies being used within education for teaching and learning.
Table 4.2: Items for the Perceptions of Digital Technology Variable

<table>
<thead>
<tr>
<th>Items</th>
<th>Category</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel it is important to be able to find any information whenever I want online</td>
<td>Positive Attitudes</td>
<td>Rosen (2010)</td>
</tr>
<tr>
<td>2. I feel it is important to be able to access the Internet any time I want</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I think it is important to keep up with the latest trends in technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Technology will provide solutions to many of our problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. With technology anything is possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I feel that I get more accomplished because of technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I have had more good experiences than bad experiences using the Internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I believe the Internet/WWW has potential as a learning tool</td>
<td>Use of Learning</td>
<td>Liaw et al (2002)</td>
</tr>
<tr>
<td>10. I believe the Internet/WWW is able to offer online learning activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I believe that learning how to use the Internet/WWW is worthwhile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Learning the Internet / WWW skills can enhance my academic performance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.13.1.2 Perceptions of Teaching and Learning

Perception of teaching and learning is an independent variable that was created in order to assess the views of respondents of towards teaching and learning as a constructivist or behaviourist activity. This variable has been developed from a survey instrument developed by Chan & Elliott (2002). This variable seeks to measure the degree to which a respondent agrees with the
view of teaching and learning as a instructionalist and traditional activity. Negative responses within this section will indicate a constructivist view of teaching and learning. Items used within this variable are shown in Table 4.3.

Table 4.3: Items for the Perceptions of Teaching and Learning Variable

<table>
<thead>
<tr>
<th>Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The major role of a teacher is to transmit knowledge to students</td>
<td>Chan &amp; Elliott (2002)</td>
</tr>
<tr>
<td>2. Learning occurs primarily from drilling and practice</td>
<td></td>
</tr>
<tr>
<td>3. During the lesson, it is important to keep students confined to the textbooks &amp; the desks</td>
<td></td>
</tr>
<tr>
<td>4. Lecturers should have control over what students do all the time</td>
<td></td>
</tr>
<tr>
<td>5. Teaching is simply telling, presenting or explaining the subject matter</td>
<td></td>
</tr>
<tr>
<td>6. I have really learned something when I can remember it later</td>
<td></td>
</tr>
<tr>
<td>7. Good teaching occurs when there is mostly Lecturer talk in the classroom</td>
<td></td>
</tr>
<tr>
<td>8. Students have to be called on all the time to keep them under control</td>
<td></td>
</tr>
<tr>
<td>9. Learning means remembering what the Lecturer has taught</td>
<td></td>
</tr>
<tr>
<td>10. Learning mainly involves absorbing as much information as possible</td>
<td></td>
</tr>
<tr>
<td>11. Good students keep quiet and follow Lecturer's instruction in class</td>
<td></td>
</tr>
<tr>
<td>12. For me, the traditional / lecture method for teaching is best because it covers more information / knowledge</td>
<td></td>
</tr>
<tr>
<td>13. It is best if Lecturers exercise as much</td>
<td></td>
</tr>
</tbody>
</table>
authority as possible in the classroom

14. Teaching is to provide students with accurate and complete knowledge rather than encourage them to discover it

15. A teacher's task is to correct learning misconceptions of students right away instead of letting them verify themselves

16. Learning to teach simply means practicing the ideas from lecturers without questioning them

17. No learning can take place unless students are controlled

### 4.13.1.3 Previous Experience

Previous experience is an independent variable that seeks to establish whether respondents’ previous experiences of using blogs for educational purposes were positive. The items included within this variable are shown within Table 4.4 and consists of nine items. The items for this variable have been developed from a previous study published by Halic et al (2010). The previous study by Halic et al (2010) was selected due to its suitability for this construct and its identification of items which establishes whether the previous use of blogs was a positive or negative experience for students. This measurement has been used within other studies and has been tested in other situations (Top, 2012; Asoodar et al, 2014).

<table>
<thead>
<tr>
<th>Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Before this blog, I have previously chosen to write a blog which was not a requirement of my</td>
<td>Halic et al (2010)</td>
</tr>
</tbody>
</table>
2. Before this blog, I have previously been required to write a blog as part of my academic studies.

3. My previous experience of choosing to write a blog when it was not a requirement of my academic studies were positive.

4. My previous experience of being required to write a blog as part of my academic studies was a positive experience.

5. When I previously blogged for academic purposes I wrote, read and commented on blogs more regularly than required by my lecturer.

6. Blogging helped me feel connected to other students in the course.

7. I have been stimulated to do additional readings or research on topics due to my blogging activity.

8. In comparison to my other classes, the amount of my interaction with other students in this class has increased due to blogging.

9. In comparison to my other classes, the quality of interaction with other students in this class has increased due to blogging.

4.13.1.4 Expectations

The final independent variable within this study considers the respondents’ expectations of blogging. This construct has been created using items from a previous study by Efimova & de Moor (2005). These items were selected due to their suitability relating to the area and the manner in which these items
have been tested within previous research. This variable consists of 12 items each of which seeks to establish whether respondents perceive future blogging activities as likely to be positive or negative.

Table 4.5: Items for Expectations of Blogging Variable

<table>
<thead>
<tr>
<th>Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When writing a post, I will link to other resources</td>
<td>(Efimova &amp; De Moor, 2005)</td>
</tr>
<tr>
<td>2. When writing a post, I will quote other blogs or resources</td>
<td></td>
</tr>
<tr>
<td>3. When writing a post, I will include summaries of other student’s posts</td>
<td></td>
</tr>
<tr>
<td>4. When writing a post, I will link back (i.e. post the URL) to other posts of my own</td>
<td></td>
</tr>
<tr>
<td>5. When writing a post, I will link back (i.e. post the URL) to other student’s posts</td>
<td></td>
</tr>
<tr>
<td>6. When writing a post, I will include photographs or images</td>
<td></td>
</tr>
<tr>
<td>7. I prefer to write posts on my own blog as opposed to comment on other student’s blogs</td>
<td></td>
</tr>
<tr>
<td>8. My blog was open to the general public</td>
<td></td>
</tr>
<tr>
<td>9. My blog was open to other students on my course</td>
<td></td>
</tr>
<tr>
<td>10. It is important that I have an audience for my blog</td>
<td></td>
</tr>
<tr>
<td>12. It is important I receive comments on my blog</td>
<td></td>
</tr>
</tbody>
</table>

4.13.2 The Dependent Variables

Within this study there are two dependent variables that were measured. Each of these shall be discussed in more detail below commencing with rhythm of blogging.
4.13.2.1 Rhythm

Rhythm is a dependent variable within this study which is comprised of four different areas. These are reading, writing, commenting in and commenting out. These four areas represent the main ways in which an individual will contribute to blogs and seeks to measure how much participants use blogs within their studies. This variable was established from previous research by Deng & Yuen (2010). In order to gain a measurement of how students are using blogs it is necessary to look at each of these four areas. In order to measure these areas respondents were asked two questions relating to their rhythm and usage of blogs within each area. These questions were formed in order to explore the areas of blog activity established by Deng & Yuen (2010) and consider each of the key activities determined to exist within blogging. The items included within this section can be seen in Table 4.6 below.

Table 4.6: Items for Rhythm of Blogging Variable

<table>
<thead>
<tr>
<th>Items</th>
<th>Sub Area</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often during the time you were using the blog for academic purposes did you write on your blog?</td>
<td>Writing</td>
<td>(Deng &amp; Yuen, 2010)</td>
</tr>
<tr>
<td>2. How often during the time you were using the blog for academic purposes did you read other students blogs?</td>
<td>Reading</td>
<td></td>
</tr>
<tr>
<td>3. How often during the time you were using the blog for academic purposes did you comment on other student's blogs?</td>
<td>Commenting (Out)</td>
<td></td>
</tr>
<tr>
<td>4. How often during the time you were using the blog for academic purposes did you comment on other student's blogs?</td>
<td>Commenting (in)</td>
<td></td>
</tr>
</tbody>
</table>
receive comments on your blog?

5. How often during the time you were using the blog for academic purposes did you enjoy writing posts for my blog?

6. How often during the time you were using the blog for academic purposes did you enjoy reading other students blogs and posts?

7. How often during the time you were using the blog for academic purposes did you enjoy commenting on other student's blogs?

8. How often during the time you were using the blog for academic purposes did you enjoy receiving comments on my blog?

5. Writing

6. Reading

7. Commenting (Out)

8. Commenting (in)

4.12.2.2 Perceived Learning

Perceived learning is a dependent variable which measures the amount of learning students believe they have achieved due to the use of blogs. This variable was created from a previous survey instrument used by Halic et al (2010). This variable consists of five items which are listed in Table 4.7 below.

Table 4.7: Items for Perceived Learning Variable

<table>
<thead>
<tr>
<th>Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The blog discussions help me to share my knowledge and experience with other students on</td>
<td>Halic et al (2010)</td>
</tr>
</tbody>
</table>
2. Blog discussions have made me think about concepts we have learnt outside of this class

3. Overall using the blog has helped me learn

4. I believe that incorporating blogs with teaching can enhance my learning experience in general

5. Blog discussions help me understand others points of view

4.14 Using PLS-SEM

This study adopts a non-linear regression Partial Least Squares Structural Equation Modelling (PLS-SEM) utilising WarPLS4.0 (Kock, 2013). SEM is considered to be most useful for research that includes latent unobserved variables in complex causal models (Hair et al, 2014). SEM is also considered useful due to the way in which it enables a researcher to estimate complete causal networks simultaneously (Lowry & Gaskin, 2014).

In reality there are two different forms of SEM. The first relates to covariance-based techniques (CB-SEM) and the second relates to variance-based techniques. PLS is a variance-based approach that is used for estimating models in which there are complex multivariable relationships which includes both latent and observable variables. PLS-SEM is a useful technique as it allows for both the building and testing of theory (Hair et al, 2011).

PLS is generally considered to be most appropriate in situations in which data is not normally distributed or where the research focuses on dependent variable predictors (Birkinshaw et al, 1995). PLS-SEM is also considered to be more appropriate for use where theory development or exploratory causal modelling is being undertaken (Lowry & Gaskin, 2014) and particularly where latent variable scores are used for subsequent analysis (Hair et al, 2014). CB-SEM is by comparison more useful for testing known theory and where overall fit of the proposed causal model is of importance (Lowry & Gaskin, 2014; Hair
et al, 2014). CB-SEM can in fact be unreliable in undertaking exploratory analysis that is required for theory building and may often end with factor indeterminacy. By contrast PLS-SEM avoids factor indeterminacy by composing constructs from factor scores and using these in calculations. PLS-SEM therefore yields explicit factor scores (Lowry & Gaskin, 2014).

There are several different forms of PLS-SEM software including SmartPLS, PLS Graph and WarpPLS. For this study WarpPLS has been selected due to the manner in which WarpPLS allows non-linear regressions to be modelled. This is possible as WarpPLS performs a warping at the path coefficient level using a path analysis technique. Due to the subject matter being investigated using a program which allows the identification of non-linear relationships will be useful as it is more likely to identify relationships that may not be seen within linear regression (Kock, 2013).

4.14.1 Reflective or Formative Variables

Within PLS-SEM it is possible for variables to be defined as either formative or reflective. When undertaking research using PLS-SEM it is therefore necessary to determine whether the model being investigated is a reflective measurement model, which is also referred to as Mode A measurement in PLS-SEM, or a formative measurement model, which is also known as Mode B measurement in PLS-SEM (Hair et al, 2014).

Within social science research it is most common for reflective measurement to be used as it is based on classical test theory (Hair et al, 2014). In a reflective measurement, causality is from the construct to its measures and therefore this measure represents the effects of the underlying constructs (Hair et al, 2014; Diamantopoulos & Siguaw, 2006). In comparison, formative measurement is based on the assumption that indicators cause the construct (Hair et al, 2014; Diamantopoulos & Siguaw, 2006).
Within this research model all constructs will be reflective. All items within each construct are a representative sample of the possible items that are available within the conceptual domain of the construct (Hair et al, 2014).

4.15 Pre-Testing

In order to test the validity and reliability of the survey instrument and to ensure that the survey is fully understood as expected by the target population pre-testing is undertaken. The results of the pre-testing are discussed below.

4.15.1 Content Validity

Before conducting the pre-test, the content validity of the survey was tested. In order to test the content validity of the survey the initial draft of the survey was distributed to a range of people. In total ten individuals checked the survey in order to ensure that the questions were clear, the questions had the meaning they intended to and all questions were easy to understand and clear. Those who tested the survey included four students, two managers and four academics. Those testing the survey were asked to return the survey with any comments within one week.

As a result of the comments received some wording within the survey was standardised. Throughout the survey the terms tutor, teacher and lecturer had been included to refer to academic staff. In order to ensure this was uniformly applied throughout the survey where tutor and teacher had been used this was changed to lecturer throughout the survey. Additionally, in Section A the phrase “new technology” had been used which was confusing to some respondents. This was amended to read, “web technologies” throughout Section A. Within Section C respondents suggested that the words “before this blog,” should be included before the statements. This was amended as suggested by respondents. In Section D respondents required clarification of the phrase “link back”. In order to clarify this the additional phrase “i.e. post the URL” was included in questions 4 and 5. Finally in Section F where “my
peers” had been used this was amended to read “other students on the course”. After addressing the comment received the survey was distributed to a group of 39 students studying Higher Education courses in order to pre-test the questionnaire.

4.15.2 Construct Validity and Reliability

As part of the pre-test it is useful to check the validity and reliability of the constructs. In order to test the internal reliability of the constructs the Cronbach Alpha is most frequently used (Saunders, Lewis & Thornhill, 2009). The Cronbach Alpha is used to measure the consistency of responses to a set of questions that together represent a scale that is used to measure a particular concept. When using the Cronbach Alpha, a measure of between zero and one will be given. Any values which are above 0.7 provides an indication that the questions combined within the scale will be measuring the same thing and therefore will have internal consistency (Saunders, Lewis & Thornhill, 2009). It should also be noted however that any values above 0.95 may not be desirable as where the Cronbach Alpha is above 0.95 this may indicate that the different questions are measuring the same phenomenon and may therefore be an invalid measure of the construct (Hair et al, 2014). The results of Cronbach Alpha testing for the pre-testing within this research are shown in Table 4.8
Table 4.8: Cronbach’s Alpha for Pre-testing

<table>
<thead>
<tr>
<th>Construct</th>
<th>Number of Items</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceptions of Digital Technology (PDT)</td>
<td>12</td>
<td>.879</td>
</tr>
<tr>
<td>Perceptions of Teaching and Learning (PTL)</td>
<td>17</td>
<td>.929</td>
</tr>
<tr>
<td>Previous Blogging Experience (PBE)</td>
<td>9</td>
<td>.873</td>
</tr>
<tr>
<td>Expectations of Blogging (EXB)</td>
<td>12</td>
<td>.869</td>
</tr>
<tr>
<td>Rhythm of Blogging: Reading (RYB_REA)</td>
<td>2</td>
<td>.859</td>
</tr>
<tr>
<td>Rhythm of Blogging: Writing (RYB_REA)</td>
<td>2</td>
<td>.772</td>
</tr>
<tr>
<td>Rhythm of Blogging: Commenting (in) (RYB_CMI)</td>
<td>2</td>
<td>.818</td>
</tr>
<tr>
<td>Rhythm of Blogging: Commenting (out) (RYB_CMO)</td>
<td>2</td>
<td>.845</td>
</tr>
<tr>
<td>Perceived Learning (PL)</td>
<td>5</td>
<td>.912</td>
</tr>
</tbody>
</table>

Within Table 4.8 the Cronbach Alpha values for all constructs within the pre-test are shown. In all cases the Cronbach Alpha is above 0.7 and below 0.95 and therefore all of the constructs can be considered to have internal reliability.

4.16 Sample Size and Survey Administration

In the UK and the US, the data collection was completed within 5 days. Table 4.9 provides a summary of the number of questionnaires received.
Table 4.9: Survey Administration Figures

<table>
<thead>
<tr>
<th></th>
<th>Quota</th>
<th>Available Population</th>
<th>Questionnaires Started</th>
<th>Disqualified (not using blogs)</th>
<th>% Disqualified (not using blogs)</th>
<th>Partial Completion</th>
<th>Completed Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>300</td>
<td>4010</td>
<td>768</td>
<td>413</td>
<td>53.8%</td>
<td>37</td>
<td>318</td>
</tr>
<tr>
<td>US</td>
<td>300</td>
<td>8643</td>
<td>648</td>
<td>298</td>
<td>46.0%</td>
<td>27</td>
<td>323</td>
</tr>
<tr>
<td>Overall</td>
<td>600</td>
<td>12653</td>
<td>1416</td>
<td>711</td>
<td>50.2%</td>
<td>64</td>
<td>641</td>
</tr>
</tbody>
</table>
From the Table 4.9 it is possible to see that the quotas for both the UK and US were achieved with slightly more completed surveys being returned. Following the collection period 641 useable surveys were available, 318 from the UK and 323 from the US. As a result of the disqualifying question this survey would suggest that approximately 50% of students within the population are using blogs within their studies. Similar levels for both the UK and US are found with 53.8% of respondents not being disqualified within the UK and 46% within the US.

The 641 responses collected via the panel represent 5% of the overall available panel. It is important to note that whilst the overall sample may not be very large, one of the benefits of using PLS-SEM is noted as being that it can deal with relatively small sample sizes and produce robust results (Hair et al, 2014; Henseler et al, 2009). In order to calculate required sample sizes for PLS-SEM it is recommended that the sample size should be at least ten times the largest number of structural paths that are seen pointing towards a construct within an inner path model (Hair et al, 2014). Within the research model for this study the maximum number of structural paths that are seen pointing towards a construct are four. Following the guidance provided by Hair et al (2014) this would indicate that the sample size required in this case would therefore be 40. Additionally, Saunders, Lewis & Thornhill (2009) propose that a useful rule of thumb is to seek to have at least 30 respondents within each category. Following this ruling the minimum sample required within this study would be 60.

Whilst a sample size of 60 may therefore be recommended by Saunders, Lewis & Thornhill (2009) a further recommendation made by Chin (2010) states that 100 to 200 respondents should be gathered in order to improve the accuracy of results. This is further supported by Pallant (2013) who considers that when a sample size is greater than 100, the statistical power should not be an issue. Hair et al (2014) also recommends following the criteria created
by Cohen (1992) which recommends the sample sizes shown in Table 4.10 based on the maximum number of arrows pointing at a construct.

Table 4.10: Sample Size Recommendations in PLS-SEM

<table>
<thead>
<tr>
<th>Maximum Number of Arrows pointing at a construct</th>
<th>5% Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum R square</td>
</tr>
<tr>
<td></td>
<td>0.10</td>
</tr>
<tr>
<td>2</td>
<td>110</td>
</tr>
<tr>
<td>3</td>
<td>124</td>
</tr>
<tr>
<td>4</td>
<td>137</td>
</tr>
<tr>
<td>5</td>
<td>147</td>
</tr>
<tr>
<td>6</td>
<td>157</td>
</tr>
<tr>
<td>7</td>
<td>166</td>
</tr>
<tr>
<td>8</td>
<td>174</td>
</tr>
<tr>
<td>9</td>
<td>181</td>
</tr>
<tr>
<td>10</td>
<td>189</td>
</tr>
</tbody>
</table>

Source: Adapted from Hair et al (2014)

The sample size of this study was 641 (318 UK and 323 US). The number of usable observations are therefore above the minimum level required when using the above criteria. Within the research model the maximum number of arrows pointing toward one construct is four. Therefore, in order to achieve a statistical power of 80% with a significance level at 5% and detect an R square with at least 0.10, 137 observations would be required. This therefore indicates that the sample size for this study is sufficient in order to ensure a robust PLS-SEM analysis.
4.17 Summary

In this chapter, the methodological and research methods for the study have been explained. This chapter therefore firstly considered the conceptual framework which is tested within this study. This included a brief discussion of the research model which seeks to explore the use of blogs within teaching and learning within UK and US Higher Education. This model broadly seeks to explore the factors that may influence the successful use of blogs in teaching and learning including perceptions of digital technologies, perceptions of teaching and learning, previous blogging experience and expectations of blogging. Following this the model explores the rhythm of blogging and the activities which are involved in blogging; reading, writing, commenting in and commenting out. Finally, the model seeks to establish a relationship between the rhythm of blogging and perceptions of learning when using blogs.

Following this, the chapter discussed the philosophical assumptions that underpin this research study. Here it was established that the study will follow a post-positivist approach along with a deductive approach to the research. In this chapter, the rationale for this approach has been discussed along with the reasons for choosing a survey methodology for this research.

Finally, this chapter presented the research instruments used within this study. This included an online survey which seeks to provide measurement of the various variables within the research model. Surveys were distributed in both the US and UK to enable the highest response in the shortest time particularly as these countries were expected to generate very similar results. Within the next chapter the results of the survey will be discussed and analysed using PLS-SEM.
5. Results

This chapter presents the results of the quantitative analysis of the samples. First, the chapter will begin with preliminary descriptive statistics of the samples, including respondents’ profile, data distributions, missing values and outliers. Second using PLS-SEM (WarpPLS-SEM 4.0), both the measurement and the structural models are presented. The measurement model will review how well the variables involved in the study are measured whilst the structural model will assess the relationships between these variables. The analysis of the measurement model will be based on the reliabilities and validities of the constructs. The structural model will consider the path coefficients, P values, $R^2$ and effect sizes in order to support or reject the relationship hypothesised in Chapter 3.

At the end of the chapter a conclusion summarising the results of the investigation is presented. The results obtained in this chapter are based on the data collected from students in Higher Education in the UK and US. Respondents who did not use blogs were disqualified from this survey. There was a total of 641 completed surveys which represented 47.41% of total respondents. Of the 641 completed surveys 318 were from the UK and 323 were from the US.

5.1 Descriptive Statistics

Before undertaking the analysis of the data, it is first necessary to undertake a descriptive analysis (descriptive statistics) of the data sample. A descriptive analysis is included as this allows the researcher to describe the basic characteristics of the sample under investigation (Zikmund et al., 2012). In this case sample characteristics, non-response bias, data distributions, missing values and outliers are considered.
5.1.1 Sample Characteristics

This section presents an analysis of the sample characteristics of the study in relation to the general populations. The reasons for the choice of the UK and US for this study has been previously been discussed in Section 1.1 and whilst it is understood that the UK and US have differing systems of education it is the outcome of teaching and learning that is being explored in this study and specifically student perceptions of learning as a result of using blogs. As a result, the characteristics of age, gender, mode of study, blogging platform, ethnicity, subject area and year of study will be explored here. Each of these characteristics have been chosen due to the effect differences between these countries may have on the results. In order to ensure there is no significant differences in the results an analysis of both the UK and the US has been conducted separately and is contained in Appendix B. As the results are relatively similar they will be treated as a single set of results for the purposes of this study. This therefore indicates that even though there are differences in the UK and US educational systems these do not affect the perceptions of students towards blogs within this study. These issues will now be discussed in more detail in order to give a greater insight into the nature of the sample.

5.1.1.1 Country of Study

Within this sample there are respondents from both the US and the UK. The analysis of the results has considered the responses from both countries separately but due to the similar nature of the results from both samples and additionally the similar nature of these countries the analysis presented here will consider the sample as one data set. Results of the analysis of both the UK and US are provided separately within Appendix B.

Graphicq (2015) provides an analysis of information between the UK and US and note that in relation to education there are a number of similarities between these countries but also a number of differences. Within the US the compulsory education system lasts 12 years whilst in the UK it is 13 years. The age of attending different stages of education is also similar with children.
starting primary school at age 6 within the US and age 5 within the UK and secondary school at the age of 12 with the US and 11 within the UK.

According to Graphicq (2015) technology usage within the US and UK also share similarities. Whilst within the US 84.2% of the population has access to the internet within the UK 89.84% of the population has access to the internet.

5.2 Mode of Study

Within the sample the majority of students are studying their HE programme full time. This is slightly higher than the latest available data for the general University population for 2014 where within the UK 71.9% of students are studying on a full-time basis (HESA, 2014) and within the US where 61.86% are studying on a full-time basis (US Census Bureau, 2014). This therefore demonstrates that slightly more students within the US undertake study on a part time basis.

Table 5.1 – Mode of Study by Respondent

<table>
<thead>
<tr>
<th>Attendance Type</th>
<th>Count</th>
<th>% of Respondent</th>
<th>% UK</th>
<th>% US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time</td>
<td>544</td>
<td>84.87</td>
<td>71.9</td>
<td>61.86</td>
</tr>
<tr>
<td>Part Time</td>
<td>88</td>
<td>13.73</td>
<td>28.1</td>
<td>38.14</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>1.40</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

From Table 5.1 it is clear that the UK and US share fairly similar patterns of attendance within Higher Education with approximately two thirds of students attending on a full-time basis. Within the sample the percentage of respondents who studying full time is higher than would be expected for the population. Whilst this difference exists it is not expected to have an effect on the results of the study as the levels are similar in broad terms and the study is not seeking to determine difference between those undertaking part time and full time study.
5.3 Subject Area

In order to categorise the area of study the International Standard Classification of Education (ISCED) fields of education 2014 have been used (UNESCO, 2014). These are provided by UNESCO in order to provide a system by which comparative analysis can be made across the different educational systems worldwide.

Table 5.2 – Subject Area of Study by Respondent

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Count</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>32</td>
<td>4.99</td>
</tr>
<tr>
<td>Arts and humanities</td>
<td>154</td>
<td>24.02</td>
</tr>
<tr>
<td>Social science, journalism and information</td>
<td>108</td>
<td>16.85</td>
</tr>
<tr>
<td>Business, administration and law</td>
<td>80</td>
<td>12.48</td>
</tr>
<tr>
<td>Natural sciences, mathematics and statistics</td>
<td>88</td>
<td>13.73</td>
</tr>
<tr>
<td>Information and Communication Technologies</td>
<td>39</td>
<td>6.08</td>
</tr>
<tr>
<td>Engineering, manufacturing and construction</td>
<td>31</td>
<td>4.84</td>
</tr>
<tr>
<td>Agriculture, forestry, fisheries and veterinary</td>
<td>15</td>
<td>2.34</td>
</tr>
<tr>
<td>Health and welfare</td>
<td>52</td>
<td>8.11</td>
</tr>
<tr>
<td>Services</td>
<td>17</td>
<td>2.65</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>25</td>
<td>3.90</td>
</tr>
</tbody>
</table>

Within the sample in this study the most popular subjects were arts and humanities (24.02%), social science, journalism and information (16.85%), natural sciences, mathematics and statistics (13.73%) and business, administration and law (12.48%). Within data produced by HESA (2014) similar figures were found for the percentage of students studying these subjects across the UK and in the US (National Centre for Educational Statistics, 2014). Figures for the top four subject areas are shown within Table 5.3 below.
Table 5.3 – Percentage of students within top four subject areas

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>% of Respondents</th>
<th>% within UK</th>
<th>% within US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and humanities</td>
<td>24.02</td>
<td>20.90</td>
<td>20.7</td>
</tr>
<tr>
<td>Social science, journalism and information</td>
<td>16.85</td>
<td>24.98</td>
<td>24.2</td>
</tr>
<tr>
<td>Natural sciences, mathematics and statistics</td>
<td>13.73</td>
<td>16.69</td>
<td>17.0</td>
</tr>
<tr>
<td>Business, administration and law</td>
<td>12.48</td>
<td>19.54</td>
<td>20.7</td>
</tr>
</tbody>
</table>

(Source HESA, 2014; National Centre for Educational Statistics, 2014)

Whilst there is a small difference between the percentage of respondents studying business, administration and law and arts and humanities and the general UK and US populations this is not expected to affect the results of this study.

5.4 Gender

Table 5.4 reports the gender of respondents to the survey. From this table, it can be seen that 73.48% of respondents were female, 25.74% of respondents were male and 1.09% of respondents preferred not to give a gender. Overall across both UK and US Higher Education sectors a very similar split between female and male respondents is reported with 57.2% of students within the US being female (US Census Bureau, 2014) and 56.2% of students within the UK being female (HESA, 2014). This therefore indicates that there are a greater number of female students within this sample than would be expected from the general population. Whilst representation from males within the sample is lower than expected this is not low enough to be considered to significantly affect the results. Whilst Social Media usage by males and females has been shown to differ (Perrin, 2015) this is generally considered to not be a significant influence on the digital preferences for students (Kennedy et al., 2008; Rosen, 2010).
Table 5.4 – Gender of Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Count</th>
<th>% of Respondents</th>
<th>% within UK &amp; US</th>
<th>% within UK</th>
<th>% within US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>165</td>
<td>25.74</td>
<td>43.3</td>
<td>43.8</td>
<td>42.8</td>
</tr>
<tr>
<td>Female</td>
<td>471</td>
<td>73.48</td>
<td>56.7</td>
<td>56.2</td>
<td>57.2</td>
</tr>
<tr>
<td>Prefer Not to Say</td>
<td>7</td>
<td>1.09</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

5.5 Age

Table 5.5 provides details of the age of respondents within this sample. From this table, it is possible to see that the majority of respondents (65.99%) were aged 15-24 years old with and 34.01% falling over the age of 25 years old.

Table 5.5 – Age of Respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Count</th>
<th>% of Respondents</th>
<th>% within UK</th>
<th>% within US</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 24 years’ old</td>
<td>428</td>
<td>65.99</td>
<td>73.72</td>
<td>64.27</td>
</tr>
<tr>
<td>25 years and over</td>
<td>218</td>
<td>34.01</td>
<td>17.71</td>
<td>35.5</td>
</tr>
<tr>
<td>Unknown</td>
<td>N/A</td>
<td>N/A</td>
<td>8.57</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Data from the US Census Bureau (2014) reports that within the US 64.27% of students studying on Higher Education courses will be between the ages of 15 and 24 years old and 35.5% will be 25 years and over.

Data from HESA (2014) within the UK reports in slightly different categories and in this case 73.24% of students are reported to be between the ages of 15 and 24 years old, 31.85% of students will be 25 years and over and 8.57% of students do not have reported ages.

The response from the sample therefore closely match the age categories of students from the US and are fairly closely matched to the UK in terms of
students between the ages of 15-24 years old. For those students who are 25 years and over there is a difference between the ages of the sample and the US population and the UK population. Whilst this study has discussed the issue of age as important in the definitions of the Web Generation it is interesting to note that both the sample and the general populations within both the UK and the US are over the age of 25 years. This provides an indication that the average age of University students is higher than expected when definitions such as the IGeneration and Net Generation are used. Within this study however age is not being used as a determinant of blogging usage. In reality in this study the general population who are at University are being considered as, as these results show not all students can be considered to sit within a specific technological categorisation and therefore technology cannot be applied in a standard way. As this difference is not expected to affect the results of the study differences in age will not affect the results given here.

The rejection of age as a determinant of digital usage has been discussed extensively within the discussion of digital natives and the Web Generation within the literature review (Section 2.1) and any differences between students will be found in their views towards digital technology which will be reported within the study.

### 5.6 Blogging Platform

Table 5.6 – Blogging platform used by respondents

<table>
<thead>
<tr>
<th>Blogging Platform</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blogger</td>
<td>247</td>
<td>38.53</td>
</tr>
<tr>
<td>Tumblr</td>
<td>229</td>
<td>35.73</td>
</tr>
<tr>
<td>WordPress</td>
<td>211</td>
<td>32.92</td>
</tr>
<tr>
<td>Type pad</td>
<td>23</td>
<td>3.59</td>
</tr>
<tr>
<td>Pebble pad</td>
<td>15</td>
<td>2.34</td>
</tr>
<tr>
<td>Mahara</td>
<td>12</td>
<td>1.87</td>
</tr>
<tr>
<td>Other</td>
<td>83</td>
<td>12.95</td>
</tr>
</tbody>
</table>
Table 5.6 presents the blogging platform used by respondents when blogging within their studies. This table shows that Blogger is the most popular blogging platform used by 38.53% of respondents. This was followed by Tumblr (35.73% of respondents) and WordPress (32.92% of respondents). A number of respondents indicated that they used alternative blogging platforms for their studies. These included blogging systems such as those incorporated into their University’s virtual learning environment (Blackboard, Moodle, etc.) and also other websites and tools.

5.6.1 Data Distribution

When analysing results from quantitative studies it is important to assess the properties of the distribution scores in order to calculate how many times a score has occurred. Ideally the data should be normally distributed symmetrically around the centre of all scores in a normal distribution (Field, 2009). Many statistical tests used by researchers assume that data is normally distributed and therefore this is an important measure to make.

When using PLS-SEM however there is no need to check the normality of the data distributions as PLS-SEM does not make any assumptions about the distribution of the data (Hair et al, 2014). PLS-SEM can in fact make very robust estimations of non-normal distributions (Hair et al, 2012) and therefore there is no need for the data distribution to be checked in this study.

5.6.2 Non-Response Bias

When using a sample survey in order to collect information relating to individuals’ perceptions and behaviours it is important to consider non-response bias. Whilst sample surveys can be a useful way in which to generate findings that are applicable to a large population the value is somewhat reliant on the reduction of non-response bias. Non-response bias refers to the possibility that those who respond to a survey will answer in substantially a different way than those who do not and therefore respondents
cannot be used to generalise results to the full population (Armstrong & Overton, 1977).

A number of tools exist in order to assess the non-response bias within a sample data set. Within education and learning technology research one of the most commonly used methods is comparing late and early respondents (Ketkar et al., 2012; Armstrong & Overton, 1977; Lambert & Harrington, 1990) By comparing early and late respondents it is possible to see whether there are differences between the responses of those who reply earlier to the survey than those who reply later. In general, it is considered that those respondents that respond later to the survey are likely to answer the survey in a way that is similar to non-respondents (Armstrong & Overton, 1977).

In order to compare the responses of early and late respondents in this case a t-test technique using SPSS, known as Levene’s test, has been undertaken. In keeping with previous studies respondents were split between early and late respondents and 15 randomly chosen survey items were tested (Ketkar et al., 2012). The t-test is used when there is a need to compare the scores of two groups. Whilst the t-test will assume normal distribution of data in this case it can be used with the current data due to the low number of respondents within the sample (Pallant, 2013).

The Levene’s test has been undertaken in order to compare early and late respondents in the UK, early and late respondents in the US and respondents within the US and the UK. The results obtained from this test (Appendix C) have illustrated that the significance value is higher than 0.05 and therefore it can be assumed that both groups share the same variances. Furthermore it can be seen that the t-values (Sig 2 tailed) are non-significant (p values are greater than 0.05) for all items and therefore it can be assumed that there is no significant difference between the groups.

Overall it can therefore be concluded that both samples used in this study are representative of the whole population and therefore non-response bias is not expected to exist within this study.
5.6.3 Missing Data

When collecting, data using a survey method it is possible that respondents may accidentally or deliberately fail to answer a question (Field, 2009). In Warp-PLS-SEM any missing values from the data are automatically replaced by the mean of other values within that factor (Kock, 2013).

Hair et al (2014) however suggest that if an observation is missing more than 15% of values the researcher should consider removing this observation from the data set. If an observation is retained that contains more than 15% of means of other values, it is likely that the variability of the data will be reduced and the likelihood of gaining meaningful and insightful results will be significantly reduced. Due to these concerns, any observations within this data set that are missing more than 15% of their values will be removed. Within this research 64 observations were removed as they were missing 15% or more of their values.

5.6.4 Outliers

Outliers relate to respondents that give scores that are very different to the rest of respondents. When respondents give responses that are very different from those of others these can affect the mean and inflate the standard deviation (Field, 2009). Outliers can also significantly affect the shape of the distribution and in extreme cases can change the sign of a linear relationship (Kock, 2013).

Whilst some authors suggest the removal of outliers from the data (Field, 2009, Saunders, Lewis & Thornhill. 2009) others argue that the deletion of outliers can be a mistake as outliers can reveal the true nature of the relationship (Kock, 2013). It should be noted that in these cases it is still recommended that outliers should be removed if their cause is measurement error (Kock, 2013).
When using Warp-PLS-SEM it is possible for outliers to be dealt with effectively without removing them from the data set. Within Warp-PLS-SEM the software can run the analysis by ranking the data and therefore the distances between values that typify outliers will be reduced without reducing the sample size.

5.6.5 Resampling Methods

Within this study, the “stable” algorithm from Warp-PLS-SEM will be used. This algorithm is considered to deal effectively with small samples by generating low standard errors and medium to high effect sizes which as a result will increase statistical power.

The stable algorithm also provides p values that are similar to the most stable p values seen within the software’s other resampling methods which include jack-knifing, bootstrapping and blindfolding. The stable algorithm can be considered to be a combination of the more traditional resampling methods provided within Warp-PLS-SEM (Kock, 2013).

5.6.6 Common Method Bias

In order to ensure there was no common method bias a number of the statements within the questionnaire included negatively worded statements. In addition to this a test for common method bias was conducted using Harman’s single factor test post-hoc. All the items were entered into principal component factor analysis. In Harman’s one-factor analysis if the single emerging factor accounted for more than 50% of the variances, bias would exist within the model. In this research model the single emerging factor accounted for 21.39% of the variance within the full sample. Harman’s one factor analysis was also tested with the UK and US samples independently and in these cases the emerging single factor accounted for 20.13% within the UK sample and 22.87% within the US sample. The results of these tests are available within Appendix D.
Within this research therefore the use of the reversal method for question design (perceptions of teaching and learning) within the survey along with the satisfaction of Harman’s one-factor analysis supports the absence of common method bias within this research (Jiao et al., 2013).

In this section, the sample’s characteristics have been provided, missing data and measurement errors have been discussed, outliers have been explored and the resampling algorithm has been discussed. The next section will look at the research model in more detail and will discuss the PLS-SEM analysis and hypotheses testing of this study.

5.7 PLS Analysis

Within structural equation modelling there are two elements of the model that need to be considered. These are known as the measurement model (outer model) and the structural model (inner model) (Hair et al, 2014). The measurement model is concerned with the relationships between the latent constructs and the indicator variables (Hair et al, 2014) whilst the structural model is concerned with the relationships or paths between the constructs (Hair et al, 2014).

It is accepted that in order to undertake an analysis of a PLS-SEM model it will be necessary to firstly analyse the measurement model and secondly the structural model (Jarvis, Mackenzie & Podsakoff, 2003). Jarvis, Mackenzie & Podsakoff (2003) argue that that it is necessary to ensure that the measurement model is properly specified before any meaning can be assigned to the structural model. They in fact state that convergence in the measurement model should be considered a criterion for undertaking causal analysis.

In order to analyse the measurement model, the reliabilities of individual indicators and latent constructs will be tested as well as the convergent and discriminant validities of the measures (Hair et al, 2014). If reliability and
validity is not check the structural model can be considered to be biased and therefore unreliable (Hair et al, 2014).

Before discussing the model in more detail Table 5.7 provides details of the variables included within the model and the codes that have been assigned to them.

Table 5.7 Variables included within the research model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceptions of Digital Technology</td>
<td>PDT</td>
</tr>
<tr>
<td>Perceptions of Teaching and Learning</td>
<td>PTL</td>
</tr>
<tr>
<td>Previous Blogging Experience</td>
<td>PBE</td>
</tr>
<tr>
<td>Expectations of Blogging</td>
<td>EXB</td>
</tr>
<tr>
<td>Rhythm of Blogging – Reading</td>
<td>RYB_REA</td>
</tr>
<tr>
<td>Rhythm of Blogging – Writing</td>
<td>RYB_WRT</td>
</tr>
<tr>
<td>Rhythm of Blogging – Commenting in</td>
<td>RYB_CMI</td>
</tr>
<tr>
<td>Rhythm of Blogging – Commenting Out</td>
<td>RYB_CMO</td>
</tr>
<tr>
<td>Perceived Learning</td>
<td>PL</td>
</tr>
</tbody>
</table>

5.7.1 The Nature of the Constructs

Before assessing the estimations of the measurement model, it is first necessary to establish the nature of the constructs used within the model. Constructs within a PLS-SEM model can either be reflective or formative (Hair et al, 2014; Kock, 2013) however these two approaches are based upon different concepts and therefore require different evaluative measures (Hair et al, 2014).
Within a model reflective indicators are considered to be equal and internally consistent. Items within a reflective indicator can therefore be considered to be interchangeable and are expected to be highly correlated with the latent variable score (Kock, 2013). One item from a reflective indicator can be removed without affecting the measurement (Jarvis, Mackenzie & Podsakoff, 2003). In reflective indicators causality passes from the construct (latent variable) to the indicators (items) (Jarvis, Mackenzie & Podsakoff, 2003). These observed indicators are therefore assumed to reflect variations in the latent variables and these variations are expected to be seen within the indicators (Hensler et al, 2009).

Formative indicators are expected to measure certain attributes of the latent variable but the indicators are not necessarily highly correlated with the latent variable score or each other (Kock, 2013). In this case, an indicator cannot therefore be removed without affecting the measurement (Jarvis, Mackenzie & Podsakoff, 2003).

Within education and learning technologies research reflective measures are the most frequently used indicators. The use of reflective measures has been previously discussed within the methodology chapter (Section 3.17).

### 5.8 Measurement Model of the Reflective Constructs

In order to check the reflective constructs the internal consistency reliability and validity will be assessed. The specific measures used for reflective variables are composite reliability, convergent validity and discriminant validity. Composite reliability will be used to evaluate the internal consistency. Individual indicator reliability and average variance extracted (AVE) will be used to evaluate convergent validity. Finally, the Fornell-Larcker criterion and cross loading will be used to assess discriminant validity (Hair et al, 2014; Fornell & Larcker, 1981).
5.8.1 Individual item reliability

In order to check the reliability of the individual items of a reflective indicator it is necessary to consider the indicators’ loadings. (Kock, 2011) Traditionally only indicators that have a loading of 0.7 or above should be retained (Hulland, 1999). More recently however this has been challenged and it is now common to see loadings greater than 0.5 to be published within empirical studies (Hulland, 1999; Kock 2011). Loadings that are greater than 0.5 are therefore now considered to be an accepted level for empirical research (Hulland, 1999; Kock, 2011).

Items should also however have a p value which is significant (less than 0.05) (Hair et al, 2011). Low loadings for items can be a result of poorly worded questions, an irrelevant indicator or an inappropriate transfer of an indicator from one context to another (Hulland, 1999).

The indicators’ loadings and their p values for this study are attached in Appendix E. After deleting the items with loadings below 0.5 the remaining loadings of the retained indicators were greater than the 0.5 threshold. This therefore indicated that the indicators used within this model had a satisfactory individual reliability. The dropped indicators were: PTL2, 8,12 and 20 and EXB 6,7,8 and 9.

As the constructs within this model have been identified as reflective the removal of these items will have no effect upon the measurement of the variable.

5.8.2 Internal Consistency Reliability

Construct reliability provides an estimate of a construct’s internal consistency (Hair et al, 2011). Reliability will measure whether the indicators used within the latent variable are understood in a similar way by different respondents. Estimating reliability can be undertaken in two ways. Firstly, composite reliability can be measured and secondly the Cronbach Alpha coefficient can be measured (Kock, 2011; Ketkar et al., 2012).
Composite reliability measures will vary between 0 and 1 with higher levels providing an indication of higher levels of reliability. A measure of between 0.6 and 0.7 will be considered satisfactory for exploratory studies and a measure of between 0.7 and 0.9 will be considered satisfactory for explanatory studies (Hair et al, 2014). Values above 0.95 are not desirable as this can indicate that the variables may be measuring the same phenomenon and may therefore be an unreliable measure of the construct. Values below 0.6 indicate that there is a lack of internal consistency reliability. When using the Cronbach Alpha for reliability testing a measure of 0.7 or higher is generally considered to be acceptable (Mackenzie et al, 2011). Therefore, applying a conservative measure both compositive reliability and the Cronbach Alpha coefficients should be equal or greater than 0.7 (Formell & Larcker, 1981; Nunnaly, 1978; Nunnally & Berstein, 1994). A more relaxed approach to this criterion is that one of the two coefficients should be equal or greater than 0.7 or at an even more relaxed criterion 0.6 (Nunnally & Berstein, 1994).

The composite reliability and Cronbach alpha measures for all constructs within this research are shown in Table 5.8.

Table 5.8: Composite Reliability and Cronbach Alpha Reliability

<table>
<thead>
<tr>
<th>Construct</th>
<th>Composite Reliability</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDT</td>
<td>0.9</td>
<td>0.853</td>
</tr>
<tr>
<td>PTL</td>
<td>0.943</td>
<td>0.935</td>
</tr>
<tr>
<td>PBE</td>
<td>0.913</td>
<td>0.893</td>
</tr>
<tr>
<td>EXB</td>
<td>0.876</td>
<td>0.836</td>
</tr>
<tr>
<td>RYB_WRT</td>
<td>0.865</td>
<td>0.691</td>
</tr>
<tr>
<td>RYB_REA</td>
<td>0.914</td>
<td>0.813</td>
</tr>
<tr>
<td>RYB_CMO</td>
<td>0.922</td>
<td>0.832</td>
</tr>
<tr>
<td>RYB_CMI</td>
<td>0.891</td>
<td>0.757</td>
</tr>
<tr>
<td>PL</td>
<td>0.942</td>
<td>0.926</td>
</tr>
</tbody>
</table>
Within Table 5.8 it is possible to see that the composite reliability is above 0.7 in all cases and no variables are above 0.95. The Cronbach Alpha is above 0.7 in all but one case.

In the one case where the Cronbach Alpha does not reach 0.7 the composite reliability is in excess of 0.7 as suggested by Nunnally & Berstein (1994). In addition, both the composite reliability and Cronbach alpha exceed the more relaxed criterion of 0.5 (Kock, 2013). It is also argued that values between 0.60 and 0.70 are acceptable especially within exploratory research (Hair et al, 2014). Hair et al (2014) also suggest that the Cronbach Alpha can be sensitive to the number of items within the construct. Where lower numbers of items are included within a construct the Cronbach Alpha is likely to be more sensitive than it would otherwise be. Due to the close level of this item to 0.7 and the above recommendations the item with a Cronbach Alpha of 0.691 will be kept. It is important to also note that values above 0.95 can be considered to be undesirable because they can indicate that the indicator values may be measuring the same phenomenon and are therefore unlikely to be a valid measure of the construct (Hair et al, 2014). Measures above 0.90 should be treated with caution as this can also reflect the same phenomenon however these can still be included as a valid measure of the construct (Hair et al, 2014). These results therefore demonstrate that the reflective measurement instruments used in this research have satisfactory reliability.

5.8.3 Convergent validity

In order to consider the validity of the measurement model the convergent validity will also be explored. Convergent validity considers the extent to which a measure correlates positively with other measure of the same construct (Hair et al, 2014).

Convergent validity can be established through the Average Variance Extracted by the latent construct (AVE). For the AVE, a value of 0.5 or greater is expected (Fornell & Larcker, 1981). An AVE of 0.5 or more suggests that on average the construct explains 50% or more of the variance of its indicators.
The AVE for this research model are shown in Table 5.9 and demonstrates that all reflective variables are above 0.5 and therefore have good convergent validity.

Table 5.9: The latent Variables AVEs

<table>
<thead>
<tr>
<th>Construct</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDT</td>
<td>0.694</td>
</tr>
<tr>
<td>PTL</td>
<td>0.525</td>
</tr>
<tr>
<td>PBE</td>
<td>0.546</td>
</tr>
<tr>
<td>EXB</td>
<td>0.504</td>
</tr>
<tr>
<td>RYB_WRT</td>
<td>0.763</td>
</tr>
<tr>
<td>RYB_REA</td>
<td>0.842</td>
</tr>
<tr>
<td>RYB_CMO</td>
<td>0.856</td>
</tr>
<tr>
<td>RYB_CMI</td>
<td>0.804</td>
</tr>
<tr>
<td>PL_BLG</td>
<td>0.731</td>
</tr>
</tbody>
</table>

5.8.4 Discriminant Validity

In addition to convergent validity we also need to consider discriminant validity. Discriminant validity measures the extent to which constructs are truly distinct from each other (Hair et al, 2014). Good discriminant validity indicates that each construct is measuring a different phenomenon within the model (Hair et al, 2014).

The testing of discriminant validity is based on two criteria. Firstly, it is necessary to examine the cross loadings of the indicators. In order to determine if there is discriminant validity an indicator’s outer loading on the associated construct should be greater than all of its loadings on the other constructs. If a cross loading exceeds the indicators outer loadings this will represent a discriminant validity problem (Hair et al, 2014). As this method is
considered to be fairly liberal in establishing discriminant validity the Fornell-Larcker criterion can also be used in addition (Hair et al, 2011).

The Fornell-Larcker criterion represents a more conservative approach to establishing discriminant validity and requires that the square root of each construct’s AVE should be greater than its highest correlation with any other construct (Hair et al, 2014; Fornell & Larcker, 1981). This means that the square root of the AVE should be higher than any of the correlation involving that latent variable and therefore the values on the diagonal should be higher than any of the values above or below them, in the same column or to their right or left (Fornell & Larcker, 1981; Kock, 2013).

Within Table 5.10 the square roots of AVEs are provided for each latent variable. Within this table it can be seen that the square root of the AVE is greater than any of the other correlations involving the construct. Furthermore, all the indicators loadings with their latent variables are higher than the cross loadings (loadings with other constructs). Table 5.10 therefore demonstrates that there is satisfactory discriminant validity in this research.
Table 5.10: Square Root of AVEs

<table>
<thead>
<tr>
<th></th>
<th>PDT</th>
<th>PTL</th>
<th>PBE</th>
<th>EXB</th>
<th>RYB_WRT</th>
<th>RYB_REA</th>
<th>RYB_CMO</th>
<th>RYB_CMI</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDT</td>
<td>0.833</td>
<td>-0.121</td>
<td>0.138</td>
<td>0.121</td>
<td>0.19</td>
<td>0.181</td>
<td>0.06</td>
<td>0.11</td>
<td>0.158</td>
</tr>
<tr>
<td>PTL</td>
<td>-0.121</td>
<td>0.724</td>
<td>0.308</td>
<td>0.409</td>
<td>-0.124</td>
<td>-0.09</td>
<td>0.121</td>
<td>0.069</td>
<td>-0.036</td>
</tr>
<tr>
<td>PBE</td>
<td>0.138</td>
<td>0.308</td>
<td>0.739</td>
<td>0.608</td>
<td>0.345</td>
<td>0.395</td>
<td>0.454</td>
<td>0.43</td>
<td>0.221</td>
</tr>
<tr>
<td>EXB</td>
<td>0.121</td>
<td>0.409</td>
<td>0.608</td>
<td>0.71</td>
<td>0.191</td>
<td>0.293</td>
<td>0.386</td>
<td>0.341</td>
<td>0.182</td>
</tr>
<tr>
<td>RYB_WRT</td>
<td>0.19</td>
<td>-0.124</td>
<td>0.345</td>
<td>0.191</td>
<td>0.873</td>
<td>0.69</td>
<td>0.599</td>
<td>0.65</td>
<td>0.393</td>
</tr>
<tr>
<td>RYB_REA</td>
<td>0.181</td>
<td>-0.09</td>
<td>0.395</td>
<td>0.293</td>
<td>0.69</td>
<td>0.918</td>
<td>0.728</td>
<td>0.694</td>
<td>0.414</td>
</tr>
<tr>
<td>RYB_CMO</td>
<td>0.06</td>
<td>0.121</td>
<td>0.454</td>
<td>0.386</td>
<td>0.599</td>
<td>0.728</td>
<td>0.925</td>
<td>0.751</td>
<td>0.364</td>
</tr>
<tr>
<td>RYB_CMI</td>
<td>0.11</td>
<td>0.069</td>
<td>0.43</td>
<td>0.341</td>
<td>0.65</td>
<td>0.694</td>
<td>0.751</td>
<td>0.897</td>
<td>0.386</td>
</tr>
<tr>
<td>PL_BLG</td>
<td>0.158</td>
<td>-0.036</td>
<td>0.221</td>
<td>0.182</td>
<td>0.393</td>
<td>0.414</td>
<td>0.364</td>
<td>0.386</td>
<td>0.855</td>
</tr>
</tbody>
</table>
5.8.5 Collinearity test

In addition to validity and reliability it is also suggested that a full collinearity test should be conducted (Kock & Lynn, 2012). Collinearity occurs when two or more indicators are highly correlated. When collinearity occurs amongst two or more indicators this is termed multicollinearity and this can result in redundancy amongst constructs.

In PLS-SEM it is recommended that the full variance inflation factor (VIF) should be used with each predictor construct in order to assess full collinearity. Full collinearity VIF will consider both vertical and lateral collinearity (Kock & Lynn, 2012). When full collinearity VIF is used a measure of 3.3 or less suggest that there are no instances of multicollinearity in the model (Kock & Lynn, 2012).

More conservatively full collinearity VIF can also be accepted if it is less than 5 or in some cases even lower than 10 (Hair et al, 1987, 2009; Kline, 1998). The full VIF for this research is shown in Table 5.11. As all VIFs are below 5 it can be concluded that no collinearity exists within this model. As the full VIF can also be used to assess common method bias it can also be assumed that no common method bias exists in this case (Kock & Lynn, 2012; Lindell & Whitney, 2001).
Table 5.11: Full VIFs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Full VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDT</td>
<td>1.102</td>
</tr>
<tr>
<td>PTL</td>
<td>1.403</td>
</tr>
<tr>
<td>PBE</td>
<td>1.848</td>
</tr>
<tr>
<td>EXB</td>
<td>1.827</td>
</tr>
<tr>
<td>RYB_WRT</td>
<td>2.283</td>
</tr>
<tr>
<td>RYB_REA</td>
<td>3.016</td>
</tr>
<tr>
<td>RYB_CMO</td>
<td>3.077</td>
</tr>
<tr>
<td>RYB_CMI</td>
<td>2.84</td>
</tr>
<tr>
<td>PL_BLG</td>
<td>1.267</td>
</tr>
</tbody>
</table>

5.9 Structural Model Results

Following the establishment of satisfactory validity and reliability within the measurement model the structural model can now be assessed. The structural model will consider the relationships that exist between the variables within the model and will determine how well the empirical data supports the theory/concept and therefore whether the theory/concept has predictive capability (Hair et al, 2014).

As discussed previously PLS-SEM does not utilise goodness of fit and therefore the structural model will be assessed based on a number of other criteria. In order to assess the structural model, it is necessary to first evaluate the significance of the path coefficients within the structural model. Following this the value of $R^2$ will be assessed before the effect size $f^2$ and the $Q^2$ are measured.

5.9.1 Model fit indices

In order to assess the model, fit within PLS-SEM three indices are used. These are average path coefficient (APC), average $R^2$ (ARS) and average variance inflation factor (AVIF) (Kock, 2011). It is proposed that in order for
the model to be valid the p values of the APC and ARS should be significant (less than 0.05) and the AVIF should be lower than 5 (Kock, 2012; Rosenthal & Rosnow, 1991).

Table 5.12 provides the model fit indices for this research model. This table demonstrates that all model fit indices are within required thresholds.

Table 5.12: Model Fit Indices

<table>
<thead>
<tr>
<th>Indices</th>
<th>Results</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average path coefficient (APC)</td>
<td>0.173, P=&lt;0.001</td>
<td>P value less than 0.05</td>
</tr>
<tr>
<td>Average R-squared (ARS)</td>
<td>0.202, P=&lt;0.001</td>
<td>P value less than 0.05</td>
</tr>
<tr>
<td>Average adjusted R-squared (AARS)</td>
<td>0.206, P=&lt;0.001</td>
<td>P value less than 0.05</td>
</tr>
<tr>
<td>Average block VIF (AVIF)</td>
<td>1.664</td>
<td>acceptable if &lt;= 5, Ideally &lt;= 3.3</td>
</tr>
<tr>
<td>Average full collinearity VIF (AFVIF)</td>
<td>2.074</td>
<td>acceptable if &lt;= 5, ideally &lt;= 3.3</td>
</tr>
</tbody>
</table>

5.9.2 Goodness of fit Criteria

It is important to recognise that within PLS-SEM there is no single goodness-of-fit criterion (Hair et al, 2014). Fit within the context of PLS-SEM has a different meaning from other contexts such as CB-SEM. Within PLS-SEM the focus is on the discrepancy between the observed or approximated values of the dependent variables and the values predicted by the model. Within PLS-SEM it is therefore necessary to rely on measures that indicate the model’s predictive capabilities in order to judge the quality of the model (Hair et al, 2014).
It should be noted that a global goodness-of-fit measure for PLS-SEM has been proposed by Tenenhaus et al. (2005). However further research has challenged the use of the global goodness-of-fit measure both conceptually and empirically (Hair et al., 2014). Research by Henseler and Sarstedt (2012) has demonstrated that the goodness-of-fit measure does not represent a goodness-of-fit criterion for PLS-SEM. Researchers have therefore been advised not to use the measure created by Tenenhaus et al. (2005).

5.9.3 Structural Model Path Coefficients and Coefficient of Determination ($R^2$)

The results of the data analysis of the model are presented in Figure 5.1. The arrows and adjacent values illustrate the effects between the variables and their $\beta$ coefficients, including their $p$ values. $R^2$ values show the explained variance of endogenous latent variables for the structural model. These are displayed under the endogenous variables.

The structural model relationships shown in Figure 5.1 represent the hypothesized relationships proposed in Chapter 3. These are represented by the path coefficients ($\beta$). The $\beta$ coefficients have standardised values ranging from -1 to +1 values (Kock, 2013). Values closer to +1 demonstrate a strong positive relationship whereas values closer to -1 demonstrate a strong negative relationship. Values closer to 0 indicate a weak relationship.
Figure 5.1: Research Framework with Results
Figure 5.1 illustrates that student perceptions of digital technology has no effect on the degree to which students read or comment both in and out within blogs. Perceptions of digital technologies do however have a weak effect on the rhythm of writing ($\beta=0.102$, $p<0.002$).

Perceptions of teaching and learning show results whereby there appears to be no effect of perceptions of teaching and learning on commenting out but there are significant effects upon reading ($\beta=-0.262$, $p<0.001$), writing ($\beta=-0.249$, $p<0.001$) and commenting in ($\beta=-0.104$, $p=0.002$).

Previous blogging experience is shown to have a positive effect on commenting of blogging rhythm with commenting in ($\beta=0.36$, $p<0.001$) and commenting out ($\beta=0.356$, $p<0.001$) showing the highest levels of influence. Previous blogging experience also has a significant effect on reading ($\beta=0.361$, $p<0.001$) and writing ($\beta=0.376$, $p<0.001$). Previous blogging experience therefore has a positive effect on all aspects of blogging rhythm.

Finally, higher positive expectation levels in relation to blogging appear to indicate a higher rhythm of blogging in terms of reading and commenting but not writing. Higher positive expectations appear to effect reading ($\beta=0.17$, $p<0.001$), commenting in ($\beta=0.36$, $p<0.001$) and commenting out ($\beta=0.203$, $p<0.001$).

In addition to the path coefficients it is also considered that evaluating the $R^2$ coefficient of the endogenous latent variables is an important step in assessing the structural model (Hair et al, 2012; Henseler et al, 2009). It is interesting to note that whilst the $R^2$ is considered to be of importance it is often not reported within journal papers and research (Martinez-Lopez, 2013).

The $R^2$, also known as the coefficient of determination, provides an indication of the 'amount of explained variance of the endogenous latent variables in the structural model' (Hair et al, 2014).
When considering an acceptable level for \( R^2 \) it is important to note that different values appear to be suggested by different authors and in different disciplines. A common figure for values suggest that 0.67 can be considered high, 0.33 can be considered moderate and 0.19 can be considered weak (Chin, 1998).

Table 5.13 provides a summary of all coefficient values. From this table, it can be seen that rhythm of blogging results were mainly statistically meaningful and weak with all four rhythm variables reporting \( R^2 \) of over 0.19 (\( R^2 = \) writing = 0.19, reading = 0.231, commenting in = 0.205 and commenting out = 0.23). Perceived learning also demonstrated a statistically meaningful but weak \( R^2 \) (\( R^2 = 0.203 \)).

Table 5.13: Path Coefficients, P Values and R Squares

<table>
<thead>
<tr>
<th>Relationships Path</th>
<th>Coefficient</th>
<th>P Value</th>
<th>( R^2 )</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDT -&gt; RYB_WRT</td>
<td>0.102</td>
<td>0.002</td>
<td>0.19</td>
<td>Positive, Significant, weak</td>
</tr>
<tr>
<td>PTL -&gt; RYB_WRT</td>
<td>-0.249</td>
<td>&lt;0.001</td>
<td>0.19</td>
<td>Negative, Significant, weak</td>
</tr>
<tr>
<td>PBE -&gt; RYB_WRT</td>
<td>0.376</td>
<td>&lt;0.001</td>
<td>0.19</td>
<td>Positive, Significant, weak</td>
</tr>
<tr>
<td>EXB -&gt; RYB_WRT</td>
<td>0.052</td>
<td>0.076</td>
<td>0.19</td>
<td>Non-significant</td>
</tr>
<tr>
<td>PDT -&gt; RYB_REA</td>
<td>0.079</td>
<td>0.014</td>
<td>0.231</td>
<td>Non-significant</td>
</tr>
<tr>
<td>PTL -&gt; RYB_REA</td>
<td>-0.262</td>
<td>&lt;0.001</td>
<td>0.231</td>
<td>Negative, Significant, weak</td>
</tr>
<tr>
<td>PBE -&gt; RYB_REA</td>
<td>0.361</td>
<td>&lt;0.001</td>
<td>0.231</td>
<td>Positive, Significant, weak</td>
</tr>
<tr>
<td>Source</td>
<td>Target</td>
<td>R (P&lt;0.05)</td>
<td>Beta</td>
<td>FDR</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------</td>
<td>------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>EXB -&gt; RYB_REA</td>
<td></td>
<td>0.17</td>
<td>&lt;0.001</td>
<td>0.231</td>
</tr>
<tr>
<td>PDT -&gt; RYB_CMO</td>
<td></td>
<td>-0.023</td>
<td>0.262</td>
<td>0.23</td>
</tr>
<tr>
<td>PTL -&gt; RYB_CMO</td>
<td></td>
<td>-0.074</td>
<td>0.02</td>
<td>0.23</td>
</tr>
<tr>
<td>PBE -&gt; RYB_CMO</td>
<td></td>
<td>0.356</td>
<td>&lt;0.001</td>
<td>0.23</td>
</tr>
<tr>
<td>EXB -&gt; RYB_CMO</td>
<td></td>
<td>0.203</td>
<td>&lt;0.001</td>
<td>0.23</td>
</tr>
<tr>
<td>PDT -&gt; RYB_CMI</td>
<td></td>
<td>0.028</td>
<td>0.216</td>
<td>0.205</td>
</tr>
<tr>
<td>PTL -&gt; RYB_CMI</td>
<td></td>
<td>-0.104</td>
<td>0.002</td>
<td>0.205</td>
</tr>
<tr>
<td>PBE -&gt; RYB_CMI</td>
<td></td>
<td>0.36</td>
<td>&lt;0.001</td>
<td>0.205</td>
</tr>
<tr>
<td>EXB -&gt; RYB_CMI</td>
<td></td>
<td>0.161</td>
<td>&lt;0.001</td>
<td>0.205</td>
</tr>
<tr>
<td>RYB_WRT -&gt; PL</td>
<td></td>
<td>0.158</td>
<td>&lt;0.001</td>
<td>0.203</td>
</tr>
<tr>
<td>RYB_REA -&gt; PL</td>
<td></td>
<td>0.196</td>
<td>&lt;0.001</td>
<td>0.203</td>
</tr>
<tr>
<td>RYB_CMO -&gt; PL</td>
<td></td>
<td>0.037</td>
<td>0.153</td>
<td>0.203</td>
</tr>
<tr>
<td>RYB_CMI -&gt; PL</td>
<td></td>
<td>0.119</td>
<td>&lt;0.001</td>
<td>0.203</td>
</tr>
</tbody>
</table>
5.9.4 Effect Size

It is also suggested that effect sizes should be considered in order to show the degree to which a predictor variable weighs at the structural level (Henseler et al., 2009). The effect size is defined as ‘as an increase in $R^2$ relative to the proportion of variance that remains unexplained in the endogenous latent variable’ (Peng and Lai, 2012:473).

In the case of the effect size values of 0.02, 0.15 and 0.35 are considered to be weak, medium and large respectively (Cohen, 2013). Results below 0.02 are considered to be too weak for inclusion even when the corresponding p values are significant (Kock, 2013) Table 5.14 reports the value of the effect sizes for this research model.

Table 5.14: The Effect Sizes

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Effect Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDT -&gt; RYB_WRT</td>
<td>0.019</td>
<td>No effect</td>
</tr>
<tr>
<td>PTL -&gt; RYB_WRT</td>
<td>0.031</td>
<td>Weak</td>
</tr>
<tr>
<td>PBE -&gt; RYB_WRT</td>
<td>0.13</td>
<td>Weak</td>
</tr>
<tr>
<td>EXB -&gt; RYB_WRT</td>
<td>0.01</td>
<td>No effect</td>
</tr>
<tr>
<td>PDT -&gt; RYB_REA</td>
<td>0.014</td>
<td>No effect</td>
</tr>
<tr>
<td>PTL -&gt; RYB_REA</td>
<td>0.024</td>
<td>Weak</td>
</tr>
<tr>
<td>PBE -&gt; RYB_REA</td>
<td>0.143</td>
<td>Weak</td>
</tr>
<tr>
<td>EXB -&gt; RYB_REA</td>
<td>0.05</td>
<td>Weak</td>
</tr>
<tr>
<td>PDT -&gt; RYB_CMO</td>
<td>0.001</td>
<td>No effect</td>
</tr>
<tr>
<td>PTL -&gt; RYB_CMO</td>
<td>0.009</td>
<td>No effect</td>
</tr>
<tr>
<td>PBE -&gt; RYB_CMO</td>
<td>0.162</td>
<td>Medium</td>
</tr>
<tr>
<td>EXB -&gt; RYB_CMO</td>
<td>0.078</td>
<td>Weak</td>
</tr>
<tr>
<td>PDT -&gt; RYB_CMI</td>
<td>0.003</td>
<td>No effect</td>
</tr>
<tr>
<td>PTL -&gt; RYB_CMI</td>
<td>0.007</td>
<td>No effect</td>
</tr>
<tr>
<td>PBE -&gt; RYB_CMI</td>
<td>0.155</td>
<td>Medium</td>
</tr>
<tr>
<td>EXB -&gt; RYB_CMI</td>
<td>0.055</td>
<td>Weak</td>
</tr>
</tbody>
</table>
From Table 5.14 it can be seen that all relationships within perceptions of digital technologies reported no effects. Perceptions of teaching and learning showed no effect in relation to commenting both in and out and weak effects were shown in relation to reading and writing. Expectations of blogging and perceptions of blogging reported weak effects in all but one case. In this model, previous blogging experience reported a medium effect in two areas, commenting in and commenting out. The effects of rhythm on perceived learning were also generally weak with commenting out having no effect on perceived learning.

5.9.5 Blindfolding and Predictive Relevance (Q²)

The Q² coefficient, also known as the Stone-Geisser Q² coefficient is used for the assessment of the predictive validity or relevance associated with each latent variable block in the model, through the endogenous latent variable that is the criterion variable in the block. (Kock, 2013). In order for the Q² coefficient to display acceptable predictive validity it is recommended that a measure greater than zero should be observed (Kock, 2013). Cohen (2013) suggests that the level of the Q² can be classified in three categories. Results should be interpreted as 0.02 – weak, 0.15 – medium and 0.35 strong. Table 5.15 presents the Q² coefficients for this research. Within this Table all measures are above 0.15 but below 0.35 and therefore this model can be assumed to display a medium level of predictive validity.

Table 5.15: Q²

<table>
<thead>
<tr>
<th></th>
<th>PDT</th>
<th>PTL</th>
<th>PBE</th>
<th>EXB</th>
<th>RYB_WRT</th>
<th>RYB_REA</th>
<th>RYB_CMO</th>
<th>RYB_CMI</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.195</td>
<td>0.234</td>
<td>0.232</td>
<td>0.208</td>
<td>0.204</td>
</tr>
</tbody>
</table>
5.9.6 Summary of Results and Hypothesis Testing

From the analysis undertaken it is concluded that the hypothesis for this research as outlined in Chapter 3 can be supported or rejected as shown in Table 5.16.

From the analysis undertaken it has become clear that there is no support for perceptions of digital technology increasing the rhythm of blogging except in the case of writing (accepting H1a). Therefore, hypotheses H1b, H1c and H1d have been rejected.

In relation to perceptions of teaching and learning we have seen that a traditional view of teaching and learning has a negative effect on the rhythm of blogging in the case of reading, writing and commenting in and a constructivist view of teaching and learning has a positive effect on the rhythm of blogging in the case of writing, reading and commenting in. Therefore, H2a, H2b and H2c are all accepted. There has been no support for the effect of the perceptions of teaching and learning on commenting out however hence H2d is rejected.

From this analysis, it was found that previous experience of blogging has a positive effect on writing, reading, commenting in and commenting out therefore concluding that H3a, H3b, H3c and H3d are all accepted.

It was also found from this analysis that expectations of blogging indicate a higher rhythm of blogging in relation to reading, commenting in and commenting out and therefore H4b, H4c and H4d are all accepted. There is no support for expectations of blogging indicate a higher level of writing however therefore H4a is rejected.

Finally, this analysis has indicated that there is support for higher rhythm of blogging activity indicating a higher level of perceived learning in relation to writing, reading and commenting in. Therefore, H5a, H5b and H5c are
accepted. There is however no support for commenting out indicating higher levels of perceived learning and therefore H5d is rejected.

Table 5.16: Hypothesis Testing

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Writing</th>
<th>Reading</th>
<th>Commenting (in)</th>
<th>Commenting (out)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1 Positive perceptions towards digital technology results in higher perceived rhythm of blogging activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1a Writing</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1b Reading</td>
<td>No Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1c Commenting (in)</td>
<td>No Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1d Commenting (out)</td>
<td>No Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H2 Greater perceptions of teaching and learning as a constructivist activity results in higher perceived rhythms of blogging activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2a Writing</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2b Reading</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2c Commenting (in)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2d Commenting (out)</td>
<td>No Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H3 Positive perceptions of previous experience of blog usage indicates higher perceived rhythm of blogging activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3a Writing</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3b Reading</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3c Commenting (in)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3d Commenting (out)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H4 Positive expectations of blogging indicate higher perceived rhythm of blogging activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4a Writing</td>
<td>No Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4b Reading</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4c Commenting (in)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4d Commenting (out)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H5 Higher blogging rhythm results in a higher perception of individual learning through the use of blogging</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5a Writing</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5b Reading</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5c Commenting (in)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5d Commenting (out)</td>
<td>No Support</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The next Chapter will discuss the results obtained from this analysis in more detail.
6. Discussion

This chapter discusses the results reported in Chapter 5. In this chapter, the results will be discussed in conjunction with the research questions and literature gaps that have been identified within this study. Before discussing the results more fully it will first be useful to briefly recall the research gaps along with the research model and research questions from Chapter 3.

6.1 The Research Gap, Model and Research Questions

It is clear that within recent years the use of Web 2.0 technologies and specifically Social Media and blogs have become increasing commonplace within our everyday lives. This has led to the definition of students entering UK and US Higher Education today as The Net Generation (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott), Millennials (Doherty, 2005; Howe & Strauss, 2000) and more recently the IGeneration (Rosen, 2010, 2011; Rosen et al, 2013).

Whilst differences in the use of technology within students’ everyday lives have been explored in some detail, less empirical research has been undertaken to look at the transfer of such technologies into education and whether students who display the characteristics of the Web Generation are more likely to engage with Social Media such as blogs.

Traditionally teaching and learning within UK and US based institutions have been based in the behaviourist traditions of the late 20th Century using instructional and instructional models of teaching (Illeris, 2007; Jonassen & Land, 2000; Sherman, 2006). However significant trends are resulting in this form of teaching and learning being questioned (Rosen, 2010). The introduction of constructivist teaching and learning models are becoming increasingly prevalent within institutions within both the UK and US today.

It is argued that the changes seen in teaching and learning towards more constructivist models has grown in tandem with the rise of technology and is
particularly suited to the active (Doherty, 2005) and social nature of Web 2.0 technologies such as Social Media and particularly blogs and therefore students will be more likely to learn using such tools within a constructivist framework.

The extent to which constructivist models of teaching and learning lead to a greater engagement of learning technology has not however as yet been explored empirically within UK and US Higher Education amongst students.

One of the key Web 2.0 tools that is being used within teaching and learning are blogs. Blogs are considered to have a number of benefits compared to other forms of Web 2.0 tools and have therefore become popular amongst higher education students and staff. It is important to note that HE teachers can have been reported to have a fundamental role to play in the success or failure of teaching and learning using blogs. The degree to which students may be influenced by previous experience of using blogs and their perceptions of using blogs has not however been sufficiently explored in research to date.

When undertaking learning within a blog there is considered to be a socio-technical structure based on the concept of rhythm. The key element of this structure is known as rhythm. This is comprised of the major forms of activity which take place within the blog and are reading, writing and commenting. Whilst some research has explored the nature of these activities there appears to be a gap in exploring whether engaging in these activities more extensively does result in higher perceived learning. It is also not clear whether these activities are driven by beliefs relating to teaching and learning and perceptions of digital technologies.

Overall to date there has been relatively little empirical research to explore whether the degree to which students engage with blogs can lead to higher degrees of perceived learning.
In order to seek to explore the gaps in literature indicated above the following conceptual framework was proposed in Chapter 3 and is shown below.
Figure 6.1 Conceptual Framework for Student Blog Use
In addition to the above model a number of research questions were created in order to address the gaps identified from the literature to date. These have previously been discussed in Chapter 3 and are as follows:

**R1.** Does greater use of blogs within teaching and learning lead to higher levels of student perceived learning?

**R2.** Do higher perceived rhythm levels of blogging provide an indication of higher perceived learning levels?

**R3.** Do students who have higher positive perceptions toward digital technology have higher perceived rhythm levels of blogging?

**R4.** Do students who perceive teaching and learning as a constructivist activity have higher perceived rhythm of blogging?

**R5.** Do positive perceptions of previous experience of blog usage indicate higher rhythm of blogging activity?

**R6.** Do positive expectations of blogging indicate higher perceived rhythm of blogging activity?

In the following subsections, the findings of the research will be discussed in conjunction with the research questions identified above and also the hypotheses of this research. The first section will therefore consider the perceptions of students towards digital technology and its effect on the rhythm of blogging. This will address RQ3 and H1a, H1b, H1c and H1d. The next section will consider the perceptions of students towards teaching and learning as a constructivist activity and its effect on blogging rhythm. This will address R4 and H2a, H2b, H2c and H2d. The next section will consider the previous experience of students in using blogs and whether this is an indication of blogging rhythm. This section will therefore address R5 and H3a, H3b, H3c, H3d. The next section will consider the expectations of blogging use and whether this is an indication of blogging rhythm. This section will therefore address R6 and H4a, H4b, H4c and H4d. The penultimate section will consider whether blogging rhythm is an indicator of higher degrees of perceived learning. This will therefore address R2 and H5a, H5b, H5c and H5d. The final subsection will explore whether greater blog use leads to
higher perceived student learning. This will address R1. A summary of the findings and results will be made at the end of the section.

6.2 Student Perceptions of Digital Technology and Perceived Rhythm of Blogging (RQ3)

Perceived rhythm of blogging was found to be determined by student perceptions of digital technology only in terms of writing. Therefore, only H1a, which predicted that positive perceptions towards digital technology would result in greater writing within the blog, is accepted. H1b, H1c and H1d, which related to reading, commenting in and commenting out were rejected.

This result suggests that whilst students find using technology to record their work useful they do not see a benefit to interacting with others, either by commenting on the blogs of others, receiving comments or by reading the work of others. This therefore suggests that the concept of the Net Generation, whereby students use the Internet as a first-choice information source may be supported (Gibbons, 2007; Oblinger & Oblinger, 2005; Fisher & Newton, 2014). The characteristic suggested by Frand (2000) of students preferring typing rather than handwriting would also be supported by the use of technology for recording work.

These results would however suggest that the concept of a generation, which is homogenous and using technology within all aspects of their lives, is not supported. Literature which suggests that the Web Generation wish to learn using the collaborative nature of Web 2.0 tools (Rosen, 2010; Beetham & Sharpe, 2007; Philip, 2007; Tapscott, 2009) would not appear to be supported within these results also. These results would also suggest that students are not persistent bloggers and v-loggers as proposed by Rosen (2010) although there is no indication of whether this only applies to education or general life also.

These results do therefore support the literature in which authors consider that the use of Social Media and tools such as blogs will not be maximised if
introduced within UK and US teaching and learning. (Barnes, Marateo & Ferris, 2007; Owen, 2004; Chisholm, 2006; Jones, 2002). It is not clear from these results however whether the lack of use of blogs is due to a lack of desire on the part of students (Barnes, Marateo & Ferris, 2007; Owen, 2004) or whether this is due to the lack of changes that have occurred within the educational system (Tapscott, 2009).

In terms of the concept of digital natives and digital immigrants (Prensky, 2001a, 2001b, 2010, 2012) it does not appear that all students can be categorised as digital natives. This suggests that the categorisation of students on such clear boundaries needs to be reconsidered and that it may be more appropriate to consider students to exist along a range of categorisations of technology usage (JISC Infonet, 2009; Salajan et al, 2010).

From these results, it is not possible to reject the concept of digital natives and digital immigrants in relation to differences between students and educators. There is no indication from these results whether the lack of usage of blogs for activities other than reading is due to a disparity between the understanding and desire for usage of digital technologies by students and HE teachers (Kennedy et al, 2008). It is however possible to reject the concept of students at University today as consisting of one homogenous generation which has common views about the use of technology and who all choose to use technology in the same ways (Kennedy et al, 2008). It would appear therefore that the rejection of a “digital generation” which has common features based upon their experiences with technology during their lifetime made by Jones et al (2010) would be better supported by these results.

The manner in which these results support writing does however suggest that students do have a familiarity and are comfortable with using technology but perhaps that the move towards collaborative uses of technology are not yet fully understood or embraced by students (Margaryan, 2008; Margaryan & Littlejohn; 2008; Salajan, Schonwetter & Cleghorn, 2010; Bond, 2008). This may therefore indicate that the conditions may exist for a Web Generation to
form but that at present, differences between those within the generation are too diverse to make this possible (Perrin, 2015).

The manner in which only the writing hypothesis has been supported may also suggest that, as proposed by Margaryan (2008) students may have a deep knowledge of some digital technologies but less, or even none, of others. This may lead to students being comfortable with writing using online platforms but less comfortable with commenting and reading (Bond, 2008).

This result therefore does not fully support the concept of the Web Generation as students being fully immersed in a digital environment and using technology as fully as possible and within both their personal lives and their education (Rosen, 2010; Beetham & Sharpe, 2007; Philip, 2007). These results instead point towards the nature of this generation being more akin to the Net Generation who is expected to have a natural affinity with technology and to use the internet as a first-choice information source (Gibbons, 2007; Oblinger & Oblinger, 2005; Tapscott, 2009).

The results also suggest that blogs may work better for those students with a higher level of digital literacy as predicted within the literature (Andergassen et al, 2009; Richardson, 2010). As the result demonstrate significance in relation to writing the view that the majority of activities completed by students on the internet consist of passive activities rather than writing activities is also rejected (Salajan, Schonwetter & Cloghorn, 2010).

It is important to note however also that the levels of significance seen within the results provide an indication that there are a number of other factors which will also play a part in the motivation of both HE teachers and students in the use of blogs for teaching and learning (Allan, 2007).

As we have now considered the results of research question three, the perceptions of digital technology, we shall next consider research question four, which looks at the perceptions of teaching and learning.
In relation to student perceptions of teaching and learning it was found that perceived rhythm of blogging was determined by student perceptions of teaching and learning in relation to writing, reading and commenting in. These results therefore support hypotheses H2a, H2b and H2c which related to writing, reading and commenting in. H2d, which related to commenting out, was however rejected. As these results were negative and questions were phrased negatively these results support the view that a constructivist view of teaching and learning will lead to a greater acceptance of collaborative digital technologies such as blogs and the move towards greater active participation within the learning process by the student (Kumpulainen & Wray, 2002). This is demonstrated through the increase of perceived learning as a result of an increase in reading, writing and commenting in as suggested in the framework proposed. The lack of support for commenting out suggests that students do not perceive they learn as much from leaving comments on the blogs of others. Whilst learning may therefore be perceived to be a social activity (Culatta, 2010; Kim, 2001; Ormrod, 1999) it does not appear students consider that they learn from providing others with feedback.

These results suggest that there has been a rejection of instructionalist models of teaching and learning amongst students who are more likely to use digital technologies within their learning (Tapscott, 2009; Siemens, 2004). This also indicates that students are not all being required to work within a “pedagogic regime” which is based on instructionalist or behaviourist theories (Margararyan & Littlejohn, 2008). The manner in which greater constructionist views lead to greater use of blogs also suggests that technology is accepted as being an active, constructive and knowledge building activity (Jonassen & Land, 2000).

In relation to perceptions of teaching and learning the relationship seen between a constructivist view of teaching and learning and greater use of blogs suggests that students who use blogs are more likely to consider that comprehension of the world is developed through learning and knowledge
which is constructed by an individual (Illeris, 2007). This suggests that those using tools such as blogs more extensively are less likely to consider transfer of knowledge from a teacher to be a useful form of learning (Illeris, 2007).

Due to the nature of blogs being a form of Social Media and a collaborative technology it is also important to consider the role of social constructivism within teaching and learning. Within this study it would appear that students do see value in the sociocultural context in which they are learning (Crawford, 1996; Adams, 2006) when using blogs. Respondents have indicated they find value from receiving comments from others and also reading and writing within a blog. This therefore suggests that respondents do see learning using blogs as a social process (Illeris, 2007). Although this may possibly also provide an indication that students do not view teaching and learning as a cyclical process of continuous reciprocal interaction as suggested by Bandura (2007) when using blogs for learning as they have not considered leaving comments for others to be an important consideration.

The manner in which there was no relationship reported between commenting out and only a relationship reported between commenting in and perceptions of teaching and learning suggests that the role of the “more knowledgeable other” (Illeris, 2007) may also be present for students. The “more knowledgeable other” was identified by Vygotsky (1978) as someone who is able to help the student learn. This may include HE teachers or others commenting on a student blog.

Watson (2001) considered that within a social constructivist environment it is necessary for students to be encouraged to engage in dialogue with HE teachers and other students. It can be argued that this is possible through the manner in which students write within their blog and others comment on these posts.

Whilst social constructivism can be seen when blog use increases amongst respondents the existence of Communities of Practice (CoP) and situated learning (Lave & Wenger, 1991) is less evident. Whilst CoP and situated
learning are also based within a constructivist learning framework they require social co-participation in order to function (McCormick & Paechter, 1999). As, within this study there was no relationship seen between commenting out and perceptions of teaching and learning, this would suggest that students do not consider participating fully within a community to be important (Kimble, et al, 2008). As this is a vital element of the CoP paradigm it is unlikely that students using blogs consider they are forming CoP. It could be argued however that the manner in which respondents indicate they read the blogs of others may be an example of legitimate peripheral participation (LLP). This would suggest however that all students are working on the margins of the community and that no students perceive the value or participation until they begin to participate fully themselves.

These results therefore support that constructivist activities are more interactive and instructionalist activities are less interactive within the learning process and environment (Doherty, 2005; Ormrod, 2003; Karasavvidis, 2010; Top, 2011; Williams & Jacobs, 2004). Additionally, it may be argued that technology may be leading to an epoch in which learning will no longer be considered a submissive or transmissive activity (Johnson & Land, 2000; Doherty, 2005). It is also suggested however from these results that the reciprocal social interaction opportunities blogs provide do not appear to lead students to consider that there are increased opportunities for learning and higher levels of perceived learning (Halic et al., 2010; Leslie & Murphy, 2008).

As we have now considered the perceptions of teaching and learning and research question four we will now turn our attention to research question five, student perceptions of previous blogging use.

6.4 Student Perceptions of Previous Blogging Use and Rhythm of Blogging (RQ5)

In terms of student perceptions of previous blogging use it was found that rhythm of blogging was determined by perceptions of previous blogging use in relation to writing, reading, commenting in and commenting out. Therefore, in
this area all hypotheses (H3a, H3b, H3c and H3d) were supported. These results provide an indication that previous usage of blogs for academic purposes by students is likely to lead to future usage. It is therefore likely that where students’ previous experience of using blogs has been positive the higher the rhythm of their blogging will be in the future. Students are thereby likely to enjoy the perceived benefits from increased participation within the blog. This suggests that blogs can be considered to be motivating for students and could be a way in which students find a voice (Kerawalla et al, 2008; Nguyen, 2006).

The fact that all areas of blogging are enhanced by successful previous use also suggests that by using blogs students are able to develop a better understanding of the benefits of writing, reading and commenting both in and out. The different activities involved in blogging are considered by Kim (2008) to result in an increase in interactivity within the blog and also an increase in self-motivation for students to use blogs. This would appear to be supported in the results of this study.

The significance of the results in relation to previous usage may also provide an indication that HE teachers are embracing digital technologies within teaching and learning and are not relying only on their own experiences of education provided by their teachers (Tapscott, 2009). The positive relationship between previous usage and rhythm would suggest that teachers are introducing technology into the classroom and are using it well with students. This therefore suggests a rejection of the ideas of HE teachers as digital immigrants who find it difficult to introduce technology into the classroom (Gibbons, 2007, Prensky, 2001).

In relation to students these results provide an indication that students do enjoy using blogs within their learning and are likely to find the use of technology within their studies to be a positive experience (Rosen, 2010, 2011; Rosen et al, 2013). This would suggest also that blogs can be applicable for teaching and learning use (Sherman, 2009, Livinston, 2011).
The manner in which previous usage leads to greater degrees of future usage would also suggest that respondents who face negative issues such as trolling (Lujan-Mora & Juana-Espinosa, 2007) or issues of negative, irrelevant, non-credible or unverified feedback (Pikas, 2005; Richardson, 2010; Tremayne, 2007) may be less likely to wish to use blogs in the future.

As we have now considered the perceptions of previous blogging use and research question five, we will now turn our attention to research question six, student expectations of blogging use.

6.5 Student Expectations of Blogging Use and Rhythm of Blogging (RQ6)

In relation to student expectations of blogging use it was found that rhythm of blogging was determined by expectations of blogging use in terms of reading, commenting in and commenting out. Hence hypotheses H4b, H4c and H4d which related to reading, commenting in and commenting out are accepted and H4a, which related to writing was rejected.

These results provide an indication of the importance of expectations in using blogs in relation to reading and both commenting in and out. Expectations of blogging may be formed by previous experience (as discussed above), digital experience (as discussed above) or the views of others (including teachers) and this area shall now be considered in more detail.

Firstly, it is important to note that student expectations may be created by the instructor or teacher who is setting the learning activity (Kent & McNergney, 1999). The way in which the activity is created and explained to the students by the teacher could play an important role in setting expectations for students (Andergassen et al, 2009). It is also often the HE teacher’s decision whether to use technologies such as blogs within their teaching and learning (Holmes & Gardner, 2006, Beetham & Sharpe, 2007) and as a result the expectations of students shall be determined also.
HE teachers can also be considered to determine the degree to which students perceive different aspects of their blogging experience such as enjoyment, ease of use, personal innovativeness, enjoyment in helping others, institutional support and perceived usefulness (Lai & Chen, 2011). It has also been suggested that HE teachers can influence the expectations of students in the use of blogs by ensuring that they only use tools such as blogs in an appropriate context (Dunworthy & Scantlebury, 2007). HE teachers can also play a role in ensuring that the reasons for the use of tools such as blogs are clearly understood (Allan, 2007).

These results therefore suggest that not only are HE teachers using blogs but also that the influence of HE teachers is largely positive. This is supported by results from previous studies where student perceptions have not been positive when using blogs when engagement levels has been poor (Robertson, 2011). These results also highlight the importance of ensuring that students initial experiences in using technologies such as blogs are positive as the result of previous experience will affect future use of such tools.

A further way in which HE academic staff can ensure that student expectations of blogs are clear is by including the use of such tools as part of the assessment process. This can ensure that the purpose of the tool is clear (Livingston, 2011). Using assessment can also allow students who are performance or outcome orientated to clearly understand the role of blogs within teaching and learning (Kerawalla et al, 2008).

The results demonstrate that the higher the level of expectations for blogging an individual has the higher their rhythm will be. This is also a reflection of the commitment and effort a student is prepared to make in terms of blogging. This therefore supports the argument that where the blog activity is embraced the effort made will be rewarded (MacDuff, 2009).
As we have now considered expectations of blogging and research question six we will now turn our attention to research question two, student perceptions of previous blogging use.

### 6.6 Higher Blogging Rhythm Results in Higher Perceptions of Individual Learning Through the Use of Blogging (RQ2)

In relation to the perceptions of individual learning through the use of blogs it was found that higher perceptions of individual learning through the use of blogging were determined by higher blogging rhythm in relation to writing, reading and commenting in. Hence hypotheses H5a, H5b and H5c which related to writing, reading and commenting in are supported. There was no support for hypothesis H5d which related to commenting out however which is therefore rejected.

These results would suggest that the higher use of blogging does lead to greater levels of perceived learning although only in relation to the areas of self-expression and self-reflection which can be seen through writing, and social connection and reflection which can be triggered by reading (Deng & Yuen, 2011). Whilst comments into the blog appear to be considered to have value the fact that commenting out is not supported is likely to indicate that social interaction and reflective dialogue triggered by commenting out is not considered by students to be a significant way in which learning is enhanced (Deng & Yuen, 2011). This also suggests that students do not feel they learn as a result of leaving feedback for others and therefore do not perceive learning value in the reciprocal nature of the rhythm of the socio-cultural context (Adams, 2006).

The manner in which students perceive learning value increases with commenting in suggests that feedback as part of a social constructivist model of teaching and learning is seen as students find value from social interaction (Adams, 2006). The increase in learning seen as a result of commenting in but not commenting out would also suggest that Vygotsky’s (1978) concept of
“the more knowledgeable other” is once again seen as students consider value in the feedback given to them by others (Illeris, 2007).

As commenting out is not supported within these results it would suggest that the notion of kinship and community will not be fully developed within student blogging and the concept of learning as a CoP (Wenger, 1998b) is not supported. It will be difficult for a CoP to be created if learning value is not seen within commenting out as bridges and islands (Gumbrecht, 2004) are less likely to be built if commenting both in and out are not maintained.

According to these results, the new framework for the educational affordances of blogs created by Deng & Yuen (2011) it would appear that students are using blogs in a more individual manner rather than a community way. This therefore would suggest that students are not fully seeking to embrace the full nature of community learning and the social nature of Social Media and blogs. They also do not appear to be embracing the conversational practices of blogs (Efimova & Hendrick, 2005; Hourihan, 2002).

The manner in which learning increases when greater use of blogs is made in terms of writing, reading and commenting in does suggest that blogs are allowing students to bring together a personal narrative and receive critical reflection that is accentuating cognitive or intellectual tasks (Deng & Yuen, 2011).

The value perceived by students of comments in suggests that student perceive learning value in the attraction of an audience to their writing (Fullwood, Sheehan & Nicholls, 2009). By increasing the audience for the blog, it is likely students will receive more comments and greater degrees of feedback (Leslie & Murphy, 2008). The value found in writing also provides an indication that students find value in self-disclosure (Leslie & Murphy, 2008).
As we have now considered research question two we shall finally turn our attention to research question one which considers whether the greater use of blogs leads to higher degrees of perceived student learning.

6.7 The Greater Use of Blogs leads to Higher Degrees of Perceived Student Learning (RQ1)

Overall from these results it would appear that there are a number of different factors that will contribute to whether the greater use of blogs will lead to higher degrees of perceived learning. These will include perceptions of digital technology, perceptions of teaching and learning, perceptions of previous blog use, expectations of blog use and rhythm of blog use.

The results seen within this study would certainly suggest that the greater use a student makes of a blog in terms of reading, writing and commenting in and out the more likely they are to perceive higher levels of learning is to be. It would appear however from these results that it is generally the blogging activities of reading writing and commenting in which are perceived to have the greatest influence on perceptions of learning.

It would appear from these results that greater blog use in terms of writing will occur and greater perceived learning will therefore be seen if an individual has higher perceptions of digital technologies. This therefore suggests that where students have an existing knowledge and understanding of digital technologies they are more likely to make greater use of blogs for writing and therefore perceive higher levels of learning (Rosen, 2010, 2011; Rosen et al, 2013). This would therefore suggest that members of the Web Generation would be expected to be comfortable in using such technologies for writing and would be more likely to see higher perceived learning levels than those from less technologically advanced students.

It also appears from these results that greater blog use will occur in all areas apart from commenting out and greater perceived learning will therefore be
seen if an individual has greater perceptions of learning as a constructivist activity. This therefore suggests where students perceive learning as a process of understanding and comprehension of the world through learning and knowledge (Illeris, 2007) that blogs will be better utilized and as a result greater degrees of learning will occur. It would not appear that greater degrees of commenting on the blogs of others will however lead to greater levels of perceived learning in this case.

Greater blog use would also appear to lead to a greater degree of perceived learning where previous blogging experiences have been positive. The manner in which this related to all aspects of blogging (reading, writing, commenting in and commenting out) would suggest that previous positive experience in using blogs will result in greater confidence for individuals in using such tools and as a result increased usage and higher degrees of perceived learning. This highlights the need to ensure that all experiences of using such tools are positive as previous experiences will affect the degree to which blogs are used which will in turn influence the perceptions of degree of learning. This therefore highlights the importance of the role of HE teachers in using blogs appropriately within their teaching and introducing students to blogs well.

It would also appear that greater blog use leads to greater perceived learning where expectations of blogging are higher in the areas of reading, commenting in and commenting out. This would suggest that for those activities, which involved socialisation with others the higher the expectations the greater the degree of learning that would occur. This suggests that expectations may play a large role in determining whether students engage in the social activities of blogging. It is anticipated that increased engagement in social activities will lead to greater interaction with others and as a result greater degrees of learning will occur. This would appear to be supported in this case. As writing is usually an individual activity it would not be anticipated that expectations would provide the same role in engagement as in the social activities of reading, commenting in and commenting out.
Finally, in relation to rhythm it would appear that greater blog use does lead to higher degrees of perceived learning in all cases apart from commenting out. This therefore suggests that the social aspects of blogging do lead to higher degrees of perceived learning and this therefore suggests that the more a student uses with and engages in a blog the more perceived learning will occur. This could be due to the manner in which blogs are considered to improve the effectiveness of teaching and enable students to become more responsible for their own learning (Lai & Chen, 2011).

Due to the nature of blogs as constructivist in nature (Karasavvidis, 2010; Top, 2011; Williams & Jacob, 2004) and due to the indication that blog rhythm is increased when constructivist views of teaching are held, this provides an indication that constructivist activities and learning are taking place within student’s blogs.

6.8 Summary

Within this Chapter the results of this study have been explored in relation to the research questions and hypotheses derived from these questions which were outlined in Chapter 3. From the results, we have seen that a number of the hypotheses outlined in Chapter 3 were supported whilst others were not.

Within this Chapter the manner in which the results suggest that perceptions of digital technologies, perceptions of teaching and learning as a constructivist activity, previous experience and expectations of blogging all have a relationship with the degree of perceived learning that occurs when using blogs for teaching and learning have been discussed.

The results have shown however that the use of blogs for teaching and learning is a complex area where the different aspects of blogging rhythm appear to be influenced by different factors. For example, within these results commenting out has been shown to have relatively little relationship to perceptions of digital technology, perceptions of teaching and learning, and rhythm and perceived learning. Commenting in however appears to be highly
influenced by the different factors such as perceptions of teaching and learning, perceptions of previous experience of blog usage, positive expectations of blogging and blogging rhythm and perceived learning.

From this discussion, it would appear that greater use of blogs when used by students for teaching and learning does appear to lead to a higher degree of perceived student learning. According to this research, this appears to be driven by increased rhythm levels within in all areas of blogging activity apart from commenting out.

Within this chapter, the reasons for the results found have been discussed and the manner in which these results support or reject existing literature has been examined. The next chapter will conclude this study by summarizing the findings of this research, discussing the research aim, objectives and questions and considering the implications of these results. This chapter will also consider the study's limitations and identify further research areas.
7. Conclusion

This chapter concludes the thesis. To begin, it will briefly restate the major findings of this research study. These findings will then be linked to the research objectives determined in Chapter One. Following this the contributions and research implications are discussed in terms of theoretical and practical implications. Finally, the research limitations and future directions of work shall be discussed in the last section of this chapter.

7.1 Main Conclusions

This research study has explored the use of Blogs by students within UK and USA HE teaching and learning. Within this study, it has been shown that there are a number of different factors that influence the degree to which students are likely to use blogs. These include the manner in which students view technology, the manner in which students view teaching and learning in terms of pedagogical position and previous experience of using blogs and expectations of using blogs. It has also been demonstrated that these different factors do not affect all blogging activities equally and it has been found that different factors affect activities such as reading, writing, commenting in and commenting out in different ways.

Furthermore, the research has demonstrated that the greater use of blogs does lead to higher degrees of perceived learning in relation to reading, writing and commenting in. There has however been no support for the activity of commenting out as increasingly perceived learning amongst students. It is important to be aware however that this research reports results based on self-reported data and therefore this must be taken into account when considering the overall conclusions that can be drawn from this research.

Within this context this study has found that, overall, the greater use of blogs by UK and US HE students for teaching and learning overall does lead to
higher levels of perceived learning and therefore this would suggest that the use of blogs should be promoted within UK and US HE teaching and learning.

This research study had five research objectives that were to be addressed. The first objective was to identify the main technological positions that may influence the manner in which HE students use blogs for teaching and learning within the UK and the US. Within this study, we have seen that students are increasingly referred to by terms such as the Net Generation or Web Generation. This study has discovered that the more positive UK and US HE students feel towards the use of technology within their daily lives the more likely they are to engage in blog use when used for teaching and learning. The results however also showed that this only existed in terms of the blogging activity of writing. This suggested therefore that HE students in the UK and US today are likely to be best represented by the definition of the Net Generation rather than the IGeneration.

The second objective of the research was to identify the main pedagogical positions that may influence the manner in which HE students use blogs for HE teaching and learning within the UK and US. Here the study has supported the view that there are a range of different views of teaching and learning today. On one end of the scale are those who consider teaching and learning as a behaviourist activity and on the other end of the scale those who see HE teaching and learning as a constructivist activity. This research has also discussed the different approaches to constructivist teaching and learning. These discussions have covered concepts such as social constructivism, situated learning and CoP.

In this study, it has been shown that the more closely a student identifies with the constructivist approach to teaching and learning the more likely they are to undertake higher levels of blogging activity. In this case, positive relationships were seen in reading, writing and commenting in. The fact that commenting out was not supported in this case has suggested that students are not as yet
engaged with the concepts of situated learning and CoPs, but may relate better to the ideas of social constructivism.

The third objective of the research was to explore the influence of blogging expectations and previous experience upon the use of blogging for teaching and learning by HE students within the UK and US. Here it has been shown that both previous experience and expectations of blogging have a role to play in the greater use of blogs by students. This was shown in all areas of blogging activity for positive previous experience and in all but the area of writing for expectations of blogging. This has suggested that the role of HE teachers in both delivering and setting expectations for the use of blogs amongst students is important and can affect the way in which students will perceive blogging within their studies. As expectations are shown to affect actual usage and previous experience is also shown to affect usage, the manner in which students’ expectations are managed appears to be a particularly important element of using blogs for learning and will determine the degree to which learning is perceived to take place.

The fourth objective of this research study was to identify the different types of blogging activities that take place when HE students are using blogs for teaching and learning within the UK and US and exploring the relationship between these activities and successful use of blogs. Within this study, the blogging activities of writing, reading, commenting in and commenting out have been identified as the key aspects of blogging activity. Within this study, it has been shown that the activities of writing, reading and commenting in are all considered by students to lead to higher perceived learning. It is suggested however that students do not perceive value in the activity of commenting out. This has suggested that students do not consider themselves to learn from providing feedback to others. The results of this study have shown that the different blogging activities are influenced by different factors. Writing is likely to be increased if the student has greater degree of positive perceptions of digital technology, constructivist perceptions of teaching and learning and positive previous experience of using blogs. Reading is increased where greater constructivist perceptions of teaching and learning, positive previous
experience of using blogs and positive expectations of blog use exist. Commenting in is increased where greater constructivist perceptions of teaching and learning, positive previous experience of using blogs and positive expectations of blog use exist. Finally, commenting out is increased where greater positive perceptions of blog use exist.

The final objective of this research study was to examine whether the greater use of blogs by HE students for teaching and learning within the UK and US leads to higher levels of perceived learning amongst students. Here it has been shown that greater use of blogs does lead to higher perceived learning amongst UK and US HE students and specifically where the activities of writing, reading and commenting in are undertaken.

7.2 Contributions and Research Implications

The findings of this research study have significance for a number of different elements of the education community. The following section discusses both the theoretical and practical implications of this research.

7.2.1 Theoretical Implications

This research has looked at a number of different theoretical aspects of blog use within HE teaching and learning Within the UK and US and therefore has implications for a number of different areas.

Firstly, this research has provided an empirically tested and quantitative study of the student perceptions of the use of blogs within HE teaching and learning within the UK and US which has until this point largely been absent from literature relating to the use of blogs within HE teaching and learning. This study therefore has provided a research framework from which further research can be undertaken and an empirical basis on which work can be developed in the future. This framework will allow a number of different areas
of further research to be explored. For example, the research framework could be further expanded to include additional factors that may influence the use of blogs for HE teaching and learning within the UK and US. Alternatively, different constructs within the model could be explored in more detail such as the different aspects of expectations of blogging or previous experience. This research also could be further developed in terms of the blogging activities discussed. The activities of writing, reading and commenting in and out could for example be further divided to look at different forms of these activities within blogging. Additionally, the construct of perceived learning could be explored in more detail with different aspects of learning being considered and assessed learning rather than perceived learning being utilised could extend this model further. Another way in which this model could be further developed is through the exploration of the context in which this model has been tested. This model could additionally be tested within other levels of education (i.e. primary, secondary, vocational education) or within different countries. There are therefore a number of ways in which this model could be further developed and extended in future research as well as prove useful for others researching within this topic.

Secondly, this study has provided a critical investigation into a number of contemporary theoretical areas connected with blog use for teaching and learning including the digital perceptions of students, the pedagogical position of students and the influence of positive previous experience and expectations of blog use. This study has also considered the use of blogs from an important perspective by considering whether learning is perceived to increase when blogs are used within HE teaching and learning within the UK and US. Each of these areas of investigation can be considered to add to both the consideration of their importance in relation to blogging alone and also as part of the larger blogging usage framework that has been created as part of this research study. In this way, this study has implications for the ongoing discussions such as the iGeneration, Digital Natives / Digital Immigrants and Net Generation, the view of teaching and learning as a constructivist activity and the impact of expectations on blog usage. The results that have been seen within this study have shown there is a need for further exploration of the
use of blogs within HE teaching and learning in order to assess the value blog tools may provide and whether its use is suitable within the context in which it is being used.

Thirdly, this study has provided an opportunity to consider perceptions towards technology, teaching and learning and blog usage amongst students within the US and UK. It has allowed an opportunity to explore whether the results from these countries are similar and have shown that the perceptions of students within the UK and US are closely aligned in relation to the use of blogs for teaching and learning within HE education. In the future, it would be useful for this model to be tested in other countries in addition to the US and the UK. Comparisons of the use of different countries could provide an indication of not only student expectations of blogging but also an indication of views around the world in relation to constructivist views of teaching and learning. Using this model may also provide an indication of the similarities and differences that exist between different countries in relation to teaching and learning and may allow an understanding of the development of the use of digital technologies to be made.

7.2.2 Practical Implications

This research has practical implications for both HE teacher and HE students. The following sub-sections will therefore consider each of these areas separately.

7.2.2.1 Implications for HE Teachers

This study has a number of implications for HE Teachers. This study has demonstrated that blogs can lead students to perceive that learning has occurred. This therefore provides support for the use of blogs within the HE classroom. This study has also demonstrated however that the degree of perceived learning students consider has taken place can be dependent upon a number of different factors that have implications for HE teachers.
Firstly, this study has demonstrated that the familiarity that students have with technology can influence the success of using blogs. This therefore indicates that it is important for HE teachers to encourage students to become familiar and comfortable with technologies such as blogs. It will also be important for HE teachers to be aware of the different levels of technology awareness amongst students and ensure that, as far as possible, all students have a baseline level of comfort with such technologies. HE teachers may also wish to reflect upon the use of technology within their own classrooms and consider whether the use of technology is appropriate and useful. This study has also demonstrated the importance of student expectations when using blogs and therefore teachers should also ensure that when using blogs within their teaching that their use is carefully planned and managed to ensure student expectations are correctly maintained.

Secondly, it has been found within this study that students who perceive teaching and learning as a constructivist activity will participate more fully in blogging activities. It is therefore important that HE teachers who wish to use blogs within their classroom ensure that students understand teaching and learning as a constructivist activity and limit the amount of instructionalist activities students are asked to undertake using such tools. HE teachers should therefore reflect on their own beliefs relating to teaching and learning and consider the nature of the activities they are undertaking within their classrooms.

Thirdly, HE teachers should also be aware of the importance of student expectations and previous experience of using tools such as blogs within their learning. HE teachers are in a strong position to be able to ensure that students hold the correct expectations of using tools such as blogs and also that any experience they have using such tools is positive. If teachers have an unfamiliarity, lack of knowledge or lack of desire to use blogs within their classroom it is likely that students will not gain a positive experience and will have low expectations of the use of such tools in the future. If poor previous experience and low expectations are created it is likely that this will affect future usage of such tools.
Finally, it will also be important for HE teachers to understand the value of different blogging activities. It is important that students understand the different aspects of blogging activities and why these are important. HE teachers may also wish to consider the value of commenting out and whether, although not supported within this study, this activity could be promoted amongst students and could lead to greater perceived learning value seen within the full process of cyclical learning and peer-led feedback.

### 7.2.2.2 Implications for HE Students

This study also has a number of implications for HE students. This study has shown that students do perceive higher degrees of learning to occur when greater blogging activity is undertaken. The first implication of this study for HE students is therefore to ensure that when using tools such as blogs within teaching and learning that the blogging activity is undertaken as fully as possible. By completing blogging activities as fully as possible it is expected that HE students will perceive higher levels of learning to have occurred. This will also result in positive perceptions of previous blog usage when next using blogs within teaching and learning and is also expected to lead to higher expectations of blog use in the future.

In order to increase blogging activity, it is also important that students are aware of the different forms of blogging activity and how each will contribute to the full blogging experience. This in part can be driven by the student’s understanding of teaching and learning as a constructivist activity which is likely to be further developed in the future as constructivist learning principles become further embedded within HE.
7.3 Limitations and Future Research

Within all studies there are limitations that need to be considered and therefore in this section the limitations of this study and future research shall be considered.

Firstly, although the sample size for this study was proved to be sufficient in order to undertake a robust statistical analysis a larger sample would be likely to enhance the results further. Collecting data from students using blogs is a challenging activity and required the use of a survey audience panel in order to be undertaken. In this study, a larger sample could not be obtained however future studies may be able to commit more time and resources to data collection and therefore may be able to collect larger sample data.

Secondly, whilst this study has been based on a comprehensive literature review and approach, it is likely that some factors affecting the use of blogs within HE teaching and learning within the UK and US have not been included within the model created. Future studies may once again provide an opportunity to consider other factors that additionally influence the use of blogs within HE teaching and learning which have not been included here.

Thirdly, due to the need for this study to be focused and the nature of the greatest literature relating to this area being based within the UK and US this research considered only HE students from these countries. Future research may seek to extend this to other countries. It would also be useful to undertake comparisons between the UK and US and particularly countries that may have different pedagogical or technological positions.

Fourthly, this study has adopted a post-positivistic approach using quantitative questionnaires as a method of data collection. This method was chosen due to the lack of empirical quantitative studies within this area and the need for hypotheses testing which had not been largely developed in this area before. Whilst this approach was therefore appropriate for this study, this has not allowed for an in-depth analysis to be undertaken and therefore more detailed
results have not been obtained. Once again it may be possible for future studies to undertake more in-depth data analysis using interpretive approaches in order to gain qualitative data relating to this topic.

Finally, due to the changing nature of both technology and HE teaching and learning it may be useful for a longitudinal study to be undertaken within this area. This could explore the changing nature of the use of technology and teaching and learning and may provide useful indications of patterns of development.
Appendix A – The Covering Letter and Questionnaire

Student Use of Blogs within Higher Education

This survey aims to collect the views of Higher Education (HE) students who are using individual blogs as part of a formal requirement of their studies.

This survey has been created as part of PhD level study at the University of Plymouth, and seeks to determine the factors that may influence the degree to which blogs can be successfully used by HE students, within their studies, to increase learning. All responses will be treated confidentially and anonymously. There is a total of seven sections to this survey:

Section A. – Perceptions of Digital Technologies
Section B. – Perceptions of Teaching and Learning
Section C. – Previous Blogging Experience
Section D. – Expectations of Blogging
Section E. – Rhythm of Blogging
Section F. – Perceived Learning
Section G. - Classification

If you have any questions in relation to this survey or the study, please contact Elaine Garcia (elaine.garcia@plymouth.ac.uk). Thank you in advance for your time in completing this survey.
Section A. – Perceptions of Digital Technologies

This section seeks to determine how you feel about digital technologies. Please place a tick in the column that most closely matches the degree to which you agree or disagree with each statement.

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<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided/Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<tbody>
<tr>
<td>1</td>
<td>I feel it is important to be able to find any information whenever I want online</td>
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<td>2</td>
<td>I feel it is important to be able to access the Internet any time I want</td>
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<td>3</td>
<td>I think it is important to keep up with the latest trends in technology</td>
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<td>4</td>
<td>Technology will provide solutions to many of our problems</td>
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<td>5</td>
<td>With technology anything is possible</td>
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<td>6</td>
<td>I feel that I get more accomplished because of technology</td>
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<td>7</td>
<td>Overall, I enjoy using the Internet</td>
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<td>8</td>
<td>I have had more good experiences than bad experiences using the Internet</td>
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<td>9</td>
<td>I believe the Internet/WWW has potential as a learning tool</td>
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<td>10</td>
<td>I believe the Internet/WWW is able to offer online learning activities</td>
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<td>11</td>
<td>I believe that learning how to use the Internet/WWW is worthwhile</td>
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<td>12</td>
<td>Learning the Internet / WWW skills can enhance my academic performance</td>
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</table>
## Section B. – Perceptions of Teaching and Learning

This section seeks to determine how you feel about teaching and learning. Please place a tick in the column that most closely matches the degree to which you agree or disagree with each statement.

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<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided / Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
<tr>
<td>1. The idea of students are important &amp; should be carefully considered by the teacher</td>
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<td>2. The major role of a teacher is to transmit knowledge to students</td>
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<td>3. Learning occurs primarily from drilling and practice</td>
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<td>4. During the lesson, it is important to keep students confined to the textbooks &amp; the desks</td>
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<td>5. Lecturers should have control over what students do all the time</td>
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<td>6. Effective teaching encourages more discussion and hands on activities for students</td>
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<td>7. Teaching is simply telling, presenting or explaining the subject matter</td>
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<td>8. I have really learned something when I can remember it later</td>
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<td>9. Good teaching occurs when there is mostly Lecturer talk in the classroom</td>
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<td>10. Students have to be called on all the time to keep them under control</td>
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<td>11. Students should be given many opportunities to express their ideas</td>
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<td>12. Learning means remembering what the Lecturer has taught</td>
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<tr>
<td>13. Teaching is simply telling, presenting or explaining the subject matter</td>
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<td>14. Learning mainly involves absorbing as much information as possible</td>
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<td>15. Good students keep quiet and follow Lecturer's instruction in class</td>
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<td>16. In good classroom there is a democratic and free atmosphere which stimulates students to think and interact</td>
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<td>17. For me, the traditional / lecture method for teaching is best because it covers more information / knowledge</td>
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<td>18. Every child is unique or special and deserves an education tailored to his or her particular needs</td>
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<td>19. Good Lecturer always encourage students to think for answers themselves</td>
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<td>20. The focus of teaching is to help students construct knowledge from their learning experience instead of knowledge communication</td>
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<td>21. It is best if Lecturers exercise as much authority as possible in the classroom</td>
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<td>22. Different objectives and expectations in learning should be applied to different students</td>
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<td>23. Teaching is to provide students with accurate and complete knowledge rather than encourage them to discover it</td>
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<td>24. A teacher's task is to correct learning misconceptions of students right away instead of letting them verify themselves</td>
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<tr>
<td>25. Learning to teach simply means practicing the ideas from lecturers without questioning them</td>
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<td>26. No learning can take place unless students are controlled</td>
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<td>27. Good teachers always make their students feel important</td>
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<td>28. Instruction should be flexible enough to accommodate individual differences among students</td>
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<td>29. It is important that a Lecturer understands the feelings of the students</td>
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<td>30. Learning means students have ample opportunities to explore, discuss and express their ideas</td>
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</tbody>
</table>
Section C. – Previous Blogging Experience

This section seeks to determine how you feel about any previous experience you have in relation to blogging. Please place a tick in the column that most closely matches the degree to which you agree or disagree with each statement. Please put in a tick in the N/A column if you have no experience in relation to the statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided / Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Before this blog, I have previously chosen to write a blog which was not a requirement of my academic studies</td>
<td></td>
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<td>2</td>
<td>Before this blog, I have previously been required to write a blog as part of my academic studies</td>
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<tr>
<td>3</td>
<td>My previous experience of choosing to write a blog when it was not a requirement of my academic studies were positive</td>
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<td>4</td>
<td>My previous experience of being required to write a blog as part of my academic studies was a positive experience</td>
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<td>5</td>
<td>When I previously blogged for academic purposes I wrote, read and commented on blogs more regularly than required by my lecturer</td>
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<td>6</td>
<td>Blogging helped me feel connected to other students in the course</td>
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<td>7</td>
<td>I have been stimulated to do additional readings or research on topics due to my blogging activity</td>
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<td>8</td>
<td>In comparison to my other classes, the amount of my interaction with other students in this class has increased due to blogging</td>
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<tr>
<td>9</td>
<td>In comparison to my other classes, the quality of interaction with other students in this class has increased due to blogging</td>
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</tbody>
</table>
Section D. – Expectations of Blogging

This section seeks to determine what your expectations of your blogging experience are. Please place a tick in the column that most closely matches the degree to which you agree or disagree with each statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Undecided/Neutral</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>When writing a post, I will link to other resources</td>
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<tr>
<td>2</td>
<td>When writing a post, I will quote other blogs or resources</td>
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<tr>
<td>3</td>
<td>When writing a post, I will include summaries of other student’s posts</td>
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<td>4</td>
<td>When writing a post, I will link back (i.e. post the URL) to other post of my own</td>
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<tr>
<td>5</td>
<td>When writing a post, I will link back (i.e. post the URL) to other student’s posts</td>
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<td>6</td>
<td>When writing a post, I will include photographs or images</td>
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<tr>
<td>7</td>
<td>I prefer to write posts on my own blog as opposed to comment on other student’s blogs</td>
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<td>8</td>
<td>My blog was open to the general public</td>
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<tr>
<td>9</td>
<td>My blog was open to other students on my course</td>
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<tr>
<td>10</td>
<td>It is important that I have an audience for my blog</td>
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<tr>
<td>11</td>
<td>It is important that my blog is part of a student blog community</td>
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<tr>
<td>12</td>
<td>It is important I receive comments on my blog</td>
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</tbody>
</table>
SECTION E. – Rhythm of Blogging

This section asks you to consider how often you write, comment and read blog posts on both your own or other blogs. For the following questions please put a tick in the column that most closely matches the frequency with which you carry out the activities listed.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Very Rarely</th>
<th>Rarely</th>
<th>Frequently</th>
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</thead>
<tbody>
<tr>
<td>1. How often during the time you were using the blog for academic purposes did you write on your blog?</td>
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<tr>
<td>2. How often during the time you were using the blog for academic purposes did you read other students blogs?</td>
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<tr>
<td>3. How often during the time you were using the blog for academic purposes did you comment on other student’s blogs?</td>
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<tr>
<td>4. How often during the time you were using the blog for academic purposes did you receive comments on your blog?</td>
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<td>5. How often during the time you were using the blog for academic purposes did you enjoy writing posts for my blog?</td>
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<td>6. How often during the time you were using the blog for academic purposes did you enjoy reading other students blogs and posts?</td>
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<tr>
<td>7. How often during the time you were using the blog for academic purposes did you enjoy commenting on other student’s blogs?</td>
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<tr>
<td>8. How often during the time you were using the blog for academic purposes did you enjoy receiving comments on my blog?</td>
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</table>
# Section F. – Perceived Learning

This section seeks to determine your perceptions of your learning during the blogging activity. Please place a tick in the column that most closely matches the degree to which you agree or disagree with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided/Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
<tr>
<td>1. I actively participate in class discussions</td>
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<td>2. I volunteer my opinion in class</td>
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<td>3. I see the connections between the course content and my career goals</td>
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<td>4. I review the course content</td>
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<td>5. I compare the information from this class with other things I have learned</td>
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<td>6. I have changed my attitudes about the course subject matter as a result of this course</td>
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<td>7. I can intelligently critique the texts used in this course</td>
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<td>8. I feel more self-reliant as the result of the content learned in this course</td>
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<td>9. I feel that I am a more sophisticated thinker as a result of this course</td>
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<td>10. The blog discussions help me to share my knowledge and experience with other students on the course</td>
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<td>11. Blog discussions have made me think about concepts we have learnt outside of this class</td>
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<tr>
<td>12. Overall using the blog has helped me learn</td>
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<td>13. I believe that incorporating blogs with teaching can enhance my learning experience in general</td>
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<td>14. Blog discussions help me understand others points of view</td>
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<td>15. My point of view has been acknowledged by other students on the course and/or Lecturer in this course</td>
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Section G. – Classification

The following questions are asked to determine whether there are any differences in the views given by participants depending upon a number of general classification questions. Please place a tick in the relevant box for each section.

1. About your studies
   a. Please indicate the primary discipline / subject you are studying
   b. Please indicate the year of your study
   c. Please indicate the total number of years of study of your current course
   d. Please indicate if you are a full time or part time student

<table>
<thead>
<tr>
<th></th>
<th>Full Time</th>
<th>Part Time</th>
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</table>

2. About your blog usage
   2.1 Please indicate the blogging platform you use for your blog (please tick the relevant box)
      a. Blogger
      b. Tumblr
      c. Wordpress
      d. Type pad
      e. Other (please state) …………………………

   2.2 If you are happy for your blog to be analysed as part of this research please provide the details of your blog below (please complete the relevant boxes)
      a. Blog Title
      b. The URL of your blog http://
      c. Prefer not to say

3. What is your gender? (Please tick the relevant box)
   Male
   Female
   Other……………………..
   Prefer not to say

4. What is your marital status? (Please tick the relevant box)
   Single
   Married
   Separated but still legally married
   Divorced
   Windowed
   In a registered civil partnership
   Separated, still legally in civil partnership
   Formerly in a civil partnership which is now legally dissolved
   Surviving partner from a civil partnership
   Prefer not to say
5. Age (please complete the relevant box)

a. Please indicate the month & year you were born (MM/YYYY)

Prefer not to say

6. What is your ethnic group?

Choose one option that best describes your ethnic group or background and please tick the relevant box.

**White**
- a. English/Welsh/Scottish/Northern Irish/British
- b. Irish
- c. Gypsy or Irish Traveller
- d. Any other White background, please describe ........................................

**Mixed / Multiple ethnic groups**
- e. White and Black Caribbean
- f. White and Black African
- g. Any other Mixed/Multiple ethnic background, please describe ........................................

**Asian / Asian British**
- h. Indian
- i. Pakistani
- j. Bangladeshi
- k. Chinese
- l. Any other Asian background, please describe ........................................

**Black/African/Caribbean/Black British**
- m. African
- n. Caribbean
- o. Any other Black/African/Caribbean background, please describe ........................................

**Other ethnic group**
- p. Arab
- q. Any other ethnic group, please describe ........................................
- r. Prefer not to say

Thank you for completing this survey
Appendix B – Comparisons of UK and US Results

Table A.1 - Composite Reliability and Cronbach Alpha Reliability for UK and US

<table>
<thead>
<tr>
<th></th>
<th>UK</th>
<th>US</th>
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<th>US</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Composite Reliability</td>
<td>Cronbach’s Alpha</td>
<td>Composite Reliability</td>
<td>Cronbach’s Alpha</td>
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<tr>
<td>PDT</td>
<td>0.901</td>
<td>0.853</td>
<td>0.901</td>
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Table A.2 - The latent Variables AVEs for UK and US

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### Table A.3 - Square Root of AVEs for UK

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### Table A.3 - Square Root of AVEs for US

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Table A.4 – Full VIFs for UK and US

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Table A.5 – Model Fit Indices for UK and US

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<th>Criterion</th>
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<td>Average path coefficient (APC)</td>
<td>0.189, P=&lt;0.001</td>
<td>0.157, P=&lt;0.001</td>
<td>P value less than 0.05</td>
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<tr>
<td>Average R-squared (ARS)</td>
<td>0.223, P=&lt;0.001</td>
<td>0.212, P=&lt;0.001</td>
<td>P value less than 0.05</td>
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<td>Average adjusted R-squared (AARS)</td>
<td>0.213, P=&lt;0.001</td>
<td>0.233, P=&lt;0.001</td>
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<tr>
<td>Average block VIF (AVIF)</td>
<td>1.348</td>
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<td>acceptable if &lt;= 5, ideally &lt;= 3.3</td>
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<td>Average full collinearity VIF (AFVIF)</td>
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<td>2.071</td>
<td>acceptable if &lt;= 5, ideally &lt;= 3.3</td>
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### Table A.6 - Path Coefficients for UK and US

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<tr>
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Table A.7 - P Values for UK and US

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<td>p=&lt;0.001</td>
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Table A.8 - R Squares for UK and US

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<tr>
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<td>0.21</td>
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Appendix D – Harman’s one factor analysis

Harman’s one factor analysis for all results

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Extraction Method: Principal Component Analysis.

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Appendix F – Publications

Book chapters, journal papers and conference papers that have been published during the course of the PhD registration are included within this Appendix. Publications have been included thanks to the permission of MELSIG, ACPI, Emerald Insights, Taylor and Francis and IATED. Original versions of these publications can be located as follows:

Book Chapters:

Journal Papers:
Conference Papers:


Making it personal
— a case study of personal smart
device usage by higher education art
and design students

Elaine Garcia and Martial Bugliolo

Introduction
This case study provides an overview of the lessons learnt from a project undertaken during the academic year 2013/2014 as part of the Higher Education Academy (HEA) Changing the Learning Landscape programme. This project provided eight students with personal smart tablet devices for the academic year for their personal use.

The aim of this case study is to share the lessons learnt from a small number of students as a pilot and investigative study before undertaking further research with higher student numbers. This project therefore aims to provide a deeper understanding of the views of eight students using qualitative data rather than a quantitative approach with larger numbers of students. Learning from this project will be shared with others who may be considering the roll out of smart tablet devices for learning within their institution or for their student group. This study seeks to provide guidance in how smart devices may be best utilized within education according to the experience students had within this project.

Student experiences were captured directly through both monthly updates of usage and an end of year presentation which students were asked to complete.
Background

In October 2013 as part of a Higher Education Academy (HEA) Changing the Learning Landscape project (DLinD CLL, 2014), a number of students at Plymouth College of Art (PCA) were given smart tablet devices for their personal and educational use throughout the remainder of the academic year. The project had a number of aims including to:

- gather learner perspectives and engage students with utilising mobile devices within their learning and daily lives;
- enable staff to better understand how technology can aid student learning;
- gain an understanding of smart device usage within an Art and Design discipline context;
- provide an opportunity for students to utilise smart devices and provide feedback to the institution on their effectiveness for learning and in everyday life.

Overall this project aimed to determine if personal smart tablet devices would be useful for students within both their education and their daily lives, and whether there were particular devices and platforms that students appeared to favour due to functionality and ease of use. It is important to note that this project did not seek to deal with potential issues that would be created from introducing institution-wide smart tablet devices, but rather aimed to determine the student views on the usefulness of such devices. For these reasons this project was intended as a small scale qualitative project which would focus on specific student experiences as a result of long term smart tablet ownership.

Course Tutors were asked to nominate students who were interested in undertaking the project, who did not already own a smart tablet device and who would be expected to commit fully to the project. Ownership of smartphones by students would not exclude them from this study as this was considered to be a different type of device due to the size and nature of the devices and because smartphone usage is almost 100% amongst these student groups. Students were chosen from a range of disciplines (Games Design, Illustration, Costume Design and Photography) and were given a range of devices (Kindle Fire, iPad mini, Google Nexus, Kobo Arc) in order that the experiences of students within different disciplines and utilising different devices could be measured.
For the purposes of this project students were not given a choice of device and those within the same courses were all given a device which ran either the Android or iOS platform so that daily comparisons were not made between the differing platforms by students. Making direct side-by-side comparison is considered to be unreliable partly due to the way in which manufacturers such as Apple and Google continue to introduce new revisions and features which are instantly compared and coveted by those with other types of smart tablets (Savov, 2014). Furthermore, the manner in which companies such as Google and Apple are building brand loyalty, which is based not only on emotional attachment but also the practicality of which devices you already own, results in an allegiance which Savov considers to be akin to a religion. For these reasons it was hoped that students would focus on the device they were using and their functionality.

Methodology
This project adopted a qualitative approach and utilised a case study methodology. A qualitative approach is appropriate in this case as it allows the collection of data within a naturalistic setting allows researchers to gain an understanding of participants. (Saunders, Lewis & Thornhill, 2012).

According to Creswell and Clark (2011) the advantages of such an approach include:

- It aims to describe and interpret participant’s personal experiences of a phenomena;
- It allows participants to share their view;
- It provides a way of understanding complex phenomena;
- It tries to understand the interactions between people.

This therefore helps to ensure that the validity of the results is relatively high (Creswell, 2009).

In order to collect data and enable analysis in relation to student use of the smart tablet devices, students were asked to provide monthly written feedback on their use of the device during the preceding month and also information relating to any apps they had found to be particularly useful or work they had produced using the smart tablet. Students were given flexibility in relation to how this was provided. Some students elected to provide monthly feedback via a word document which they emailed to the project managers. Other students created blogs and updated these with
posts on a monthly basis. Students were asked to provide feedback in relation to the following:

- The use of the device for learning both within and outside of the classroom;
- The use of the device for personal purposes;
- The apps students found useful (particularly free apps);
- Any comments made by staff or other students about the device and its use by students;
- Any other comments or thoughts students had in relation to the device and its use.

In addition to the monthly feedback at the end of the project students were asked to undertake a final presentation detailing their experiences during the year with their smart tablet after which, if all aspects of the project had been successfully completed, the students would be allowed to keep the smart tablet. Following the presentation a discussion session was undertaken with each student where further questions could be asked by the project team and any additional thoughts or themes could be explored in more detail. During these presentations the academic member of staff who nominated the student for the project was invited and in all cases chose to attend the presentation, being involved in the discussion about the use of the device by the student during the project. In addition at this point students were also asked whether they thought the institution should provide students with devices, whether they would recommend fellow students purchase the specific device they had and the degree to which they felt smart tablet devices could be useful to students within their studies.

Following the completion of the student presentations students were asked to provide a copy of their presentation to the project team and this and all other feedback given by students and staff throughout the length of the project was collated. Content analysis was undertaken by the members of the project team in order to identify the key themes which emerged from the project. The themes that emerged were presented to the College’s senior management team and the project funders in the form of a final project report. This report was well received by College managers and the success of this project resulted in student smart tablet devices becoming a key area for further development in the future through incorporation in the institutions blended learning and IT strategy.
Lessons learnt

Different devices

When considering purchasing smart tablet devices it is important to firstly become acquainted with the number of differing devices that are available on the market. According to Gartner (2014) Android accounted for 62% of the smart tablet market in 2013 whilst Apple accounted for 36% of the market. Third place for smart tablet market share is held by Windows devices; however, this is only at 2% of the market. As Android and Apple devices account for 98% of the smart tablet market only these platforms were used within this project.

When considering the use of Android or Apple devices there are several issues to consider when deciding between platforms.

Android

An Android smart tablet will almost certainly represent a better option than an Apple iOS device in terms of price (Siegel, 2014). There are also a huge range of Android devices, with over 18,796 distinct devices (Sawers, 2014) available at a range of price points, all providing different features, specifications and build quality. A range of Android devices were chosen for this project, all having a similar price point at the time of purchase. These included the Google Nexus 7, the Kobo Arc and the Kindle Fire.

In this case study it appears that the Android platform is preferred by those students who have existing devices which run on the Android platform and/or who are generally more interested in digital technology. Smart tablets operating the Android platform are generally preferred amongst young people (18 or under) in contrast to over 18s preferring the Apple iOS (Phone Arena, 2012; Faw, 2013).

Students who preferred using these devices were, in general, willing to spend more time customizing the device by downloading items such as new keyboards. The students who preferred these devices also indicated features such as additional storage through an SD card slot were useful to them.

However, this case study suggests that for those students, who had already invested in Apple products such as the iPhone or MacBook, an Android
device seemed difficult to use and they clearly indicated their preference for an Apple smart tablet.

Students appeared to be particularly frustrated when using devices such as the Kindle Fire where the full Android store was not available and therefore they were not able to download all the apps they wanted.

Apple iOS

Whilst the entry price point to Apple iOS products is considerably higher than Android, those students who were given Apple smart tablets stated a preference for these devices over the Android platform. Additionally a number of students who had been using Android devices also indicated a preference for Apple iOS smart tablets as opposed to Android devices. A number of students indicated that they would rather wait to save money in order to purchase an iOS product than to purchase an Android device earlier.

According to the students the main advantages of iOS when compared to Android was the ease of use from first use and the integration between the smart tablet and other existing devices or computers. These comments largely came from students using iOS devices who also have access to Apple Mac computers or other iOS devices (iPhone, iPod) already either on a personal basis or via the institution.

In reality much of the functionality students indicated they used on the iOS smart tablet could be replicated on the Android smart tablet, but this appeared to students to be a more complicated process to undertake or they were not aware that this functionality was available.

Subjects and disciplines

Whilst all of the students in this case study were taking Art and Design courses, a range of subject areas were chosen for this project. Students were selected from subjects classed as “high digital” (Games Design), “mid digital” (Photography and Illustration) and “low digital” (Costume Design). It was not anticipated that these students would have very differing views of the usefulness of smart tablet devices when the project was commenced, but it quickly became apparent that subject related differences did exist.
Students studying digital subjects (High Digital)

When considering use by differing disciplines it is interesting to note that students who have higher digital and computer usage within their course (i.e. Games Design) were less likely to consider the smart devices to be useful to them for either their personal or educational lives. Students within the Games Design subject area actually considered that smart tablet devices were not really of great use to them. These students did however consider that those courses with lower usage of digital technology or computers within their subject would be more likely to find such devices useful.

Students in “high digital” technology subjects stated that as they were in front of a computer for much of the day and all had smartphones; the addition of a smart tablet device didn’t really add anything to their learning or personal lives. For these students an institutional investment in high specification computers was of higher importance than the purchase of smart tablet devices.

Students studying subjects with some digital aspects (Mid Digital)

For students “mid digital” subjects (Photography and Illustration) the use of smart tablet devices appeared to have more usefulness than those within the “high digital” subjects.

For “mid digital” students the use of a smart tablet device cannot replace the use of the computer, however it can provide advantages in undertaking some activities. “Mid digital” students found the devices particularly useful when working in an external environment such as visiting potential clients and displaying portfolios.

Unlike the “high digital” students, “mid digital” learners are still likely to use computers regularly as part of their course but would not necessarily be in front of a computer at all times.

Whilst these students considered that high end activities such as image manipulation still need to occur on a computer, they felt that the smart tablet devices were useful for everyday productivity activities such as email and taking notes. Even though these students were also likely to have a mobile phone they said that the size of the smart tablet was more useful for taking notes or photographs than a smartphone. The tablets were not too big to create difficulty in terms of transport; something that would create a barrier to using a computer.
These students considered that a personal smart tablet device would be useful for their studies and everyday lives but that it could not be a replacement for a computer for all aspects of their work.

*Students studying subjects with low digital aspects (Low Digital)*

It is perhaps somewhat surprising that students who were studying “low digital” subjects found the smart tablet device to be most useful to their studies and personal lives.

Whilst students undertaking “low digital” subjects would have access to computers, they stated that these would rarely be removed from storage within lessons due to the lack of need for their usage.

Therefore, in these situations the smart tablet device allowed students to access digital technology easily and quickly without the need to get a computer from storage or go to another room in order to gain access. It appears that “low digital” students generally would use the device to improve their productivity (i.e. taking notes) or would use the device on an *ad hoc* basis where it would be useful to quickly undertake an Internet search or take a photograph.

The *ad hoc* use of the smart functionality of the devices was used equally by students in high and low digital subjects. Whilst “high digital” students were able to browse the Internet easily on a computer (often their main tool within the classroom) these computers would not usually include the smart functionality provided by tablet device.

Students in “low digital” subjects report to have also found more uses for the smart tablet device in relation to both their study and personal lives than the students from mid and high digital subjects.

It appears, therefore, that the smart tablet devices provide a useful way for students studying “low digital” subjects to be introduced to digital technology and it is likely to be most useful for students within these subjects.

*Personal ownership*

One of the key aims of this project was to consider the personal nature of smart tablet devices and the significance of personal ownership of smart tablet devices.
This case study found that the personal nature of the smart tablet device does indicate the benefit of students owning their device and being able to manage it as they wish. This should include the ability for individual students to choose and download apps, to keep documents, images, books and music on the device and also to be able to personalize the device with reminders, calendars and email.

By comparison when devices have previously been provided as a group or classroom based resource within the institution these have resulted in minimal take up and the devices have therefore been largely unused. The problems associated with sharing smart tablet devices amongst students have been widely discussed amongst academic staff who have noted that the sharing of iPads can be undertaken successfully within the classroom but that it requires some time consuming workarounds (Gleeson, 2014).

Students also reported that a number of their peers had already invested in purchasing a personal smart tablet device and their usage is increasingly being seen within the classroom. This appears to be something which is accepted by academic staff who reportedly do not prevent students from using the devices in taught sessions.

This case study shows that there are clear benefits to found in accommodating the personal nature of smart tablet devices. The use of such devices is limited without a sense of personal ownership.

Institutional purchase

There were mixed responses when students were asked if they felt the institution should invest in personal smart devices for students as would be expected given their different opinions about the usefulness of devices.

The majority of students felt that the device was useful to them and would like to continue to use such a device for both their studies and personal lives. However, the students did not consider it should be a priority for the institution to purchase devices for students.

Generally students felt that devices should be purchased by individual students who wished to use them with the institution seeking to provide discounts from suppliers which could be passed on or providing apps for use by students who had purchased a device.
Some students felt that the institution could provide devices but only to those students who had demonstrated their commitment to their course through high levels of achievement or attendance.

**Conclusions**

This case study has provided an opportunity for student views about the personal use of smart tablet devices to be shared with a wider audience and has highlighted some of the complex issues that need to be considered when thinking about providing such devices to students.

It is clear from this case study that students cannot be treated as a homogenous group and views concerning the use of digital technology can be diverse and conflicting, even amongst students within a single institution and within similar discipline areas.

This case study only represents the experiences of eight students within one institution and differing results may be found within other institutions and other subject areas. Further research needs to be undertaken, particularly with larger number of students, to determine if these results do apply in other contexts and will undoubtedly change over time as digital technological changes and further innovations occur. Additionally research also needs to be undertaken to explore the views of academic staff towards the use of student smart tablets within teaching and learning. The implications of introducing such digital technology in relation to pedagogy, and teaching and learning in general, also need to be further explored.

**Acknowledgements:**

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We would like to thank the students who contributed to this project: Jordan Ash, Joanne Cookney, Ryan Holder, Charmaine McDonough, John Mears, Sophie Pring, Ellen Sexton and Lewis Wain.
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When referring to the chapters and other contributions in this text you are required to acknowledge the respective authors according to common academic practice.

It appears in:

You can download the whole book from: http://melsig.shu.ac.uk/?page_id=503
Learning occurs. This does not particularly through the use of blogs, to
learn. Properly using the technology, but also, the use of the blogs. This
leads to a student who is not only a reader or writer, but also
interacts with the content. When learning in this manner, which
students have been successful in creating meaningful content and
interactions with others.

1. Introduction

The use of blogs within higher education (HE) has become in-
creasingly popular with the rise of social networking sites and
the availability of tools such as WordPress.

Keywords: blogs, curricular, interactions, changing, academic self

Excerpts and reflections

"...within the constructivist framework of teaching and learning, as
described by De Bono (2005), the blogger is not a passive consumer of
knowledge, but rather an active participant in the construction of
meaning. The blogger engages in a process of self-discovery, where
they reflect on their experiences and construct meaning from these.
By writing about their experiences, the blogger is able to develop a
deeper understanding of the topic at hand. This process of self-
reflection and critical thinking allows the blogger to engage in
meaningful conversations with others, which can lead to a greater
understanding of the subject matter. Through the use of blogging,
students can develop a more critical and reflective approach to
learning. This approach to learning is consistent with the constructivist
framework, which emphasizes the importance of active participation
in the learning process. "

Bio: Dr. Emily Brown is an experienced educator and researcher in
the field of educational technology. Her research focuses on the
impact of technology on student learning, with a particular interest
in the use of blogs in higher education. She is currently a lecturer
in the Department of Education at the University of Plymouth.

Model

The Changing Roles of Staff and Student

With a Constructivist Educational Blog

Emily Gorda, Mel Brown and Ibrima Elahara

University of Plymouth, Plymouth, UK
Plymouth College of Art, Plymouth, UK

Abstracts: While the use of web 2.0 tools and social media platforms is
becoming more prevalent in education, the role of staff and students is
still evolving. Within this context, the use of constructivist educational
blogs provides a platform for active engagement in the learning process.
By allowing students to take an active role in the creation and sharing
of knowledge, constructivist educational blogs encourage critical
thinking and reflection. This approach to learning is consistent with
the constructivist framework, which emphasizes the importance of
active participation in the learning process. Through the use of
constructivist educational blogs, staff and students can work together
to develop a deeper understanding of the subject matter.
2. Connectivism

The learning theory of connectivism was developed as a result of a belief that there was a need for a learning theory which took into account the manner in which society has changed as a result of the use of digital technologies. (Kop & Hill, 2008) Within a connectivist learning environment, learners use technology to create networks for themselves, which are open and filled with information sources that the individual chooses. This makes the individual the network. As a result, individuals are required when building their own learning communities. (Gee, 2008)

Connectivism is driven by the influence of social constructivism, network theory and chaos theory (Cousens, 2009) and highlights the importance of learners making connections, which is more likely to occur between the learner and their learning community. (Kop & Hill, 2008)

While this approach to learning is seen to occur when peers collaboratively share opinions, viewpoints and critiques through conversation and dialogue, it is important to note that within a connectivist learning model, it is often not possible to mobile digital technologies to support a fundamental change in the role of academic staff as they are present within the learner network. (Kop & Hill, 2008) and the connections formed with others who wish to continue to learn outside of the classroom. (Fresen & Lowe, 2011)

Within this approach, learning is seen to occur when peers collaboratively share opinions, viewpoints and critiques through conversation and dialogue. (Fresen & Lowe, 2011)

In addition, it is important to note that within a connectivist learning model, it is often not possible to mobile digital technologies to support a fundamental change in the role of academic staff as they are present within the learner network. (Kop & Hill, 2008) and the connections formed with others who wish to continue to learn outside of the classroom. (Fresen & Lowe, 2011)

It is clear within connectivist learning that the individual and their network is of key importance. In addition, the nature of the network appears to support a fundamental change in the role of academic staff as they are present within the learner network. (Kop & Hill, 2008) and the connections formed with others who wish to continue to learn outside of the classroom. (Fresen & Lowe, 2011)
The conversational model is shown in Figure 2. This model demonstrates the relationships that exist between students and experts within the learning environment. Effective learning environments are not only important within the却没有在learning environment and the manner in which they interact and collaborate, but also within the blogging environment. The manner in which students interact and collaborate is crucial.

Another aspect of blogging that could support the conversational model is shown in Figure 3. (Luiten-Moore & Brown, 2007)

3. Conversational and blogs

Learning environment within the digital age.

Conversational learning is considered to be of particular relevance when considering the concept of such as teaching and learning. Despite these criticisms, the conversational model is an important tool in digital learning environments. It is a powerful tool for learning and teaching, especially when combined with other pedagogical approaches. This model is focused on the conversation between students and experts, and it is integrated with other pedagogical approaches, such as blogging, to enhance the learning experience.
4.2. Data analysis

A total of 33 students and the academic staff team (2 staff) were involved in the interviews (11 T1 and 12 T2), which were recorded, transcribed (T1 and T2), and transcribed. In addition, feedback from both staff and students was provided. From the six interviews, six students were interviewed, and from the six interviews, five students were involved in the project. The interviews were conducted in a group setting, which utilized open-ended questions. The results of both the interviews and qualitative written responses were analyzed using NVivo qualitative software.

4.3. Case study method

This theoretical builds on the results of the research to examine the role of qualitative research. The case study method was selected for the qualitative data analysis. The interviews were conducted with 33 students and the academic staff team (2 staff) to explore the phenomenon of learning the case study of Plymouth College of Art (PCA) and its impact on the results of such an approach. According to Creswell and Clark (2011), the advantages of such an approach include:

- It allows understanding the interactions between people.
- It provides a way of understanding complex phenomena.
- It allows participants to share their views.
- It allows for a transcript of the phenomena.
- It allows for a description and interpretation of phenomena.

Elaine Garcia, MPhil, Brown, and Graham Edmonds.
Learning to occur

According to anecdotal feedback was given to suggest that within the blog provided a supportive environment in which students made effective contributions to the discussion. Furthermore, it appears that students found the connections made within the blog provided a supportive environment in which effective contributions were made. "They were very voluble. They were all positive and friendly."

model:
with others so would be expected within a communicative-learning environment. The use of collective blogs seemed to mobilizes students to make contributions from the qualitative surveys conducted it would appear that thought
draft notes

6. Findings

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It is important to note that whilst some students considered

"blogs for the sake of it" (TT1)

did (show initial and ideas) in person no point in doing on.

"We tended to do more in classes face to face than on blog... we

were reluctant to ask for advice and

all of the blogs were not utilised and whilst some blogs gave interaction from

blogs on effort and whilst some blogs saw interaction from

which nothing all teams discussed using a variety of methods of

Elaine Gordo, Mel Brown and Liam McNaughton.

Case studies in learning
Group however students did not appear to be able to fully engage. Learning did however more focused towards the student and the peer. It would certainly appear that within this model, the responsibility for learning was still locked to an authoritative source of learning. By this, the model was still evaluated within a constructivist-learning model. It would appear the learning process and which students engaged within it would make a far greater sense in authentic, real-world, collaborative and interactive learning. However, unlike the constructivist and interactive learning models, within this model, students were empowered to create their own communities and environments. Peer/peer engagement allowed for flexibility within the use of blogs, as students feared they would have to be heavily directed through the use of blogs, as students feared for this reason. Students were encouraged to lead their own learning and to consider their peers.

Deans and staff held.

Discussion

7. Discussion

Blogs and students are a result of the use of blogs. Students and students as a result of the use of blogs.

Self-initiated and meaningful learning is not seen or from a more meaningful interaction. Blogs are a result of the use of blogs. Students and students as a result of the use of blogs.

Overall, it would appear that academic staff considered their role did

"July 10 version. "STL"

completely dependent on the need for that community to be.

"It is clear that some students learn so much more from the

Elaine Curri, MEL Brown and Ingrid Elston.
8. Conclusions and Recommendations

Activity

The individual learning process, although not from the broad learning environment created by the instruction, is in itself shaped by the opportunities to become removed from this in turn shaped by the opportunities to become removed from the broad learning environment created by the instruction. This is due in large part to the structure of the instruction, the broad learning environment, and the nature of the instruction.

This research highlights the need for a shift in pedagogy towards a more formative and data-driven approach to educational practices. This approach is necessary to create learning environments that are more conducive to student growth and development.

Eileen Garcia, Alejandra Ariza, and Leonardo Pantoja

Case Studies in Learning
References


Student use of Facebook for informal learning and peer support

Introduction

The emergence of Social Networking and Social Media Technologies (SMT) has resulted in reports that such technologies are now more important than ever before within our daily lives (OFCOM, 2014). The largest and most popular SMT is undoubtedly Facebook, which is reportedly utilised by 36 million unique British adult visitors per month who spend an average of 14.7 billion minutes using the site (OFCOM, 2014). Duggan et al (2014) reports that Facebook is particularly popular amongst young adults with 87% regularly using Facebook. It may therefore be assumed that Facebook is an important aspect of the majority of students’ daily lives (Deng, & Tavares, 2013; Tess, 2013; Falahah & Rosmala, 2012; Madge et al, 2009). Given the rise in popularity and widespread use of SMT amongst young people it is not surprising that an increasing number of educators are enthusiastic about the formal and informal use of SMT for teaching and learning (Selwyn, 2009).

However, whilst educators may be enthusiastic it is far from clear whether students wish for the use of SMT such as Facebook to be brought into the classroom. This may therefore highlight the fact that educators do not understand the manner in which students are currently using SMT. As such we also do not as yet have a clear understanding of the complex, invisible and organic social networks, which are formed, outside of the classroom through SMT (Junco, 2012) but which may include informal use for educational purposes. It is clear therefore that before formal educational use of SMT such as Facebook is considered it will be necessary to have a greater understanding of the manner in which students are using such tools and to explore the existing educational value and implications of their use in relation to retention and success (Amador & Amador, 2014) for those students who are existing Facebook users.

This paper will consider the existing literature in relation to student use of SMT before undertaking an analysis using Social Network Analysis (SNA) to establish the degree to which students are already using SMT. The research seeks to gain an understanding of students’ participation and the relationships that exist between them (Saunders, Lewis & Thornhill, 2012).

Social Networking and Social Media Technologies (SMT)

It is widely recognised that young adults are spending increasing amounts of their time online (Duggan et al, 2014) and one of the most popular online activities is the...
use of SMT. Social networking sites are reported to be embedding students in complex and rich webs of interactions and social relationships (Borgatti et al, 2009). In fact, Facebook is now believed to be so popular amongst students that it is considered to be an integral part of University social life (Deng & Tavares, 2013). However, this view is not shared universally as there are undoubtedly young people who do not wish to use such technologies and students who may be excluded from the use of such technologies (Hardaker et al, 2010; Falahah & Rosmala, 2012). It is also important to note that students do not use Facebook in a homogenous way and usage can be varied (Bosch, 2009). In fact, it has been suggested that those who do not wish to use such sites could feel excluded and possibly ostracised (Bloxham, 2010) from others within their communities due to the rise in the use of such technologies. Furthermore, it is important to note that where students feel forced to participate in such sites feelings of anxiety, resistance and resentment can be felt (Deng & Tavares, 2013).

In terms of the effect on education of the general use of such sites there appear to be contradictory reports. Some researchers claim that young people using SMT find it harder to communicate in class, tend to be more distracted and have shorter attention spans than non-users (Bloxham, 2010). Additionally, it is reported that the time students spend on Facebook and the frequency with which they use Facebook are negatively associated with engagement in educational activities (Junco, 2012). Furthermore, for some educators Facebook is considered to be a distraction which poorly impacts on student academic performance and study time (Irwin et al, 2012). Other commentators however have suggested that the use of SMT by students can result in better learning performance (Deng & Tavares, 2013).

Research considering the effect of the use of Facebook on education is becoming increasingly popular and there appears to be increasing academic interest in the effect of SMT on student educational performance (Junco, 2012). Research to date has however reported limited and mixed results. For example, studies that consider the direct relationship between grades and the use of Facebook appears to suggest there is either no relation between the factors (Pasek et al, 2009; Kolek & Saunders, 2008) or that those students who use Facebook have a lower overall grade (Kirschner & Karpinski, 2010, Junco, 2012; Bloxham, 2010). The majority of these studies however use self-reported measures for both the measurement of grade and use of Facebook and results may therefore not be entirely reliable.

Whilst such results may discourage the use of Facebook amongst students it is important to note that the majority of studies undertaken to date have reported on non-educationally focused use of Facebook amongst students. In these cases, the
use of Facebook was more likely to related to social purposes rather than educational activities (Hewitt & Forte, 2006). The use of Facebook for social purposes will not be expected to raise grades and is more likely to relate to the development of student social skills. Whilst social skills may not be directly linked to education and learning it something which can be considered to be an important factor for student success (Junco, 2015). It is therefore the manner in which Facebook allows students to create meaningful online relationships and mature forms of communication that is of use and is resulting in Facebook becoming an integral part of student daily life (Madge et al, 2009). It is also important to note that another benefit of the use of Facebook by students is the manner in which some students are much more comfortable with online interactions than face-to-face interactions. Using SMT may therefore provide a means through which some students are more willing to state their opinions, disagree with others and are more attuned to the opinions of others (Deng & Tavares, 2013).

It is interesting to note also that the manner in which students use Facebook changes as they progress through their academic life. During the first stages of University it would appear that students use Facebook to build and maintain new friendships at a new Institution and connect with a new peer group (Junco 2015). Facebook during the initial stages of University is therefore considered by some studies to be the “social glue” that enables students to settle into University life (Madge et al, 2009) The use of Facebook in later periods of study is considered to be more related to supporting the personal, ‘heart felt’, interactions that occur between students as they face common problems related to negotiating their learning (Sabki et al, 2013; Selwyn, 2009).

Whilst this appears to suggest Facebook allows new social interactions to occur it is important to note that activities mainly consist of the reinforcement of existing offline relationships rather than creating new relationships online (Munoz & Towner, 2011). These activities are closely aligned to the concept of social capital. Engagement in Facebook has been found to closely relate to an increase in student social capital and especially so for those students that were low in life satisfaction or self-esteem (Ellison, Steinfield & Lampe, 2007).

Social capital is broadly defined as resources, which individuals accumulate through the relationships they have with other people (Ellison, Steinfield & Lampe, 2007). Facebook is considered to be an online social space in which students are able to build and maintain social capital with others (Cheung, Chui & Lee, 2011) in two ways, firstly bridging social capital and secondly bonding social capital. Bridging social capital consists of a number of “weak ties” and as such supports the loose
social ties that individuals have and allows users to maintain and create large, relatively diffuse networks from which a wide range of resources may be drawn (Ellison, Steinfield & Lampe, 2007). The concept of “weak ties” is most often attributed to Granovetter (1983) who considered that a weak tie between an individual and an acquaintance should be viewed as an important bridge between two densely knitted circles of close friends.

Bonding social capital meanwhile reflects the relationships individuals have with family and very close friends who represent “stronger ties” with an individual and consists of individuals who will be in a position to provide emotional support and access to less easy to find resources (Ellison, Steinfield & Lampe, 2007). Whilst strong ties therefore provide greater support to an individual it is the weak ties which allow an individual to receive a wider degree of information without which they would be confined to more provincial news and the views of family and close friends only (Granovetter, 1983).

Social capital is considered to be one of the positive effects of the use of Facebook by students, particularly for those individuals who may have difficulties in forming offline relationships (Ellison, Steinfield & Lampe, 2007). Facebook also is considered to lower barriers to interaction and encourage self-disclosure, which allow individuals to create and maintain large and diffuse networks of relationships relatively cheaply and easily (Ellison, Steinfield & Lampe, 2007). Facebook can therefore be considered to allow individuals to develop diffuse and extensive networks. It is necessary however to consider, in relation to education and students, whether such benefits could be extended from the personal into the academic realm (Bosch, 2009).

Whilst the use of Facebook for social purposes may not represent a formal form of teaching and learning it has been reported that the use of Facebook and resulting discussions that may occur amongst students will result in informal learning occurring (Madge et al, 2009). The indirect result of this informal learning will result in the creation of an informal learning community (Hardaker, 2007; Munoz & Towner, 2011) or knowledge community (Selwyn, 2009). Facebook can in fact be argued to represent a continuation of the informal discourse that have been a long-term feature of student life within the Higher Education sector (Selwyn, 2009). It has been argued that Facebook can offer a platform from which students can adopt self-governed, problem-based and collaborative learning processes (Irwin et al, 2012). There does not however appear to be amongst researchers or academics a clear understanding of how students may develop these self-organised online communities and use such...
technologies to support self-directed learning that occurs beyond the classroom (Deng & Tavares, 2013).

Further benefits of Facebook use by students are considered to include: Students can gain support, information and ideas from others with whom they have a social relationship (Maghrabi, Oakley & Nemati, 2014); Students are able to use Facebook to contact classmates to ask questions about class activities (Munoz & Towner, 2011); Students are able to collaborate on assignments and projects online (Munoz & Towner, 2011); Students can connect with each other during holiday periods, share lecture notes or study notes, answer questions about the practical aspects of their University life and share learning materials they have found via the internet (Bosch, 2009). It is argued that activities such as these allow the construction of student engagement, which leads ultimately to academic gains (Junco, 2012). In this way, Facebook becomes more than solely a social network but additionally becomes an informal educational network for students (Madge et al., 2009).

The manner in which Facebook is being used and is reportedly of value to students has resulted in calls for the existing use of Facebook to be allowed to continue unabated, away from the formal education setting and to remain backstage (Selwyn, 2009). This view is supported even though some studies have reported that students would be willing to see Facebook incorporated into their academic lives (Irwin et al., 2012). Overall there appears to be considerable debate concerning whether students wish to use Facebook for academic purposes. Whether students are willing to use Facebook for academic purposes or not, it is clear that students today mainly use Facebook for social connectivity (Irwin et al., 2012). Jong et al. (2014) for example reports that whilst 81% of students state that they have experience of discussing educationally related issues on Facebook only 59% of students explicitly state that peer discussion of educationally related issue is a motive for using Facebook. There are also conflicting results in relation to whether students would wish to use Facebook for academic use. For example, Hewitt & Forte (2006) report that 66% of students would consider the presence of tutors within Facebook would be acceptable. However, Duggan et al. (2014) report that 73% of students agreed or strongly agreed that they wished to keep their social and academic lives separate. Bosch (2009) meanwhile reports that students would prefer to conduct discussions via Facebook as opposed to institutional virtual learning environments due to reasons such as existing familiarity and user experience with Facebook. It would appear that there is consensus that Facebook is generally considered to be most useful to students for firstly social purposes and secondly informal learning and it is not proven to be useful for formal learning (Madge et al., 2009).
The use of Facebook for formal learning is however something to which increasing attention is being given (Curtis, 2014; Sheninger, 2012; Pollara & Zhu, 2011). It would appear that a number of educators consider that, if used in an appropriate manner, SMT can have benefits which would be useful in an educational context. Key motivations for using Facebook within formal education included to “meet” students within their own space and additionally to utilise a site, which is already popular with students to provide students with learning materials (Bosch, 2009). SMT could for example benefit students by providing additional opportunities for them to enter new networks of collaborative learning (Selwyn, 2009), particularly collaborative student-led learning (Bosch, 2009) and to support collaboration and cooperative learning (Irwin et al, 2012) through the strengthening of weak ties and increased social bonding capital and bridging capital as discussed above. Whilst there has been interest in the use of Facebook as a formal educational tool, empirical research is largely still in its infancy and findings are at present inconclusive (Deng & Tavares, 2013; Falahah & Rosmala, 2012). In order to better comprehend the manner in which students are currently engaging with Facebook and the facilitating and debilitating factors that may affect the way in which Facebook is used by students (Deng & Tavares, 2013) a case study of a course group will be analysed using Social Network Analysis (SNA).

Research Design

This research is undertaken utilising Social Network Analysis (SNA) in order to predict the structure of the relationships that exist between social entities and the impact these relationships have on other social phenomena (Butts, 2008). This research also however utilises a case study approach due to the manner in which the collection of research data has been conducted within a natural setting and seeks to gain an understanding of participants and relationships that exist between participants (Saunders, Lewis & Thornhill, 2012).

Case Study Method

A case study approach is a qualitative research method, which allows the researcher to explore phenomena (Saunders, Lewis & Thornhill, 2012). Case studies are useful methodologies for occasions when a researcher wishes to gain an understanding of the context in which the phenomena is occurring. (Saunders, Lewis & Thornhill, 2012) One of the key advantages of a case study is the manner in which it can deal with a variety of evidence (Saunders, Lewis & Thornhill, 2012). By using a variety of evidence a more detailed view of the phenomena can be considered. (Yin, 2003).
Social Network Analysis (SNA)

SNA allows a real life social network, which consists of individuals connected to each other to be visualised by a mathematical object called a graph (Carrington, 2014). Within this graph individuals are represented as points on the graph known as “nodes” whilst the relationships between nodes are shown as lines known as “edges” (Carrington, 2014). SNA provides an approach through which the overt interactions that occur, the strength of these interactions and the types of resources exchanged can be examined in order to better understand the formation and structure of such communities (Dawson, 2008). SNA is considered to be useful as it allows researchers to view the “totality” of the social network and the context in which nodes interact and therefore the “embeddeness” of social action (Hollstein, 2014).

Data Collection

In order to capture the information required a list of all student names was obtained on a specific course group. This list was used to create a matrix of all students and the possible connections they could have with other students within the group. Each student’s name was then manually checked within Facebook and all connections were noted on the matrix. If student’s privacy settings prevented them, or their friends list, being visible publically they were excluded from the analysis. In total 86 out of 90 students were found to have accessible Facebook profiles. It is important to state that only information that was publically available within Facebook was utilised for this analysis and all students were over 18 years of age. In addition to student names researchers were also able to capture additional information about student’s attendance, gender, age and current status on the course from the College’s Management Information department. Furthermore, the Course Leader was able to provide details relating to student final grades and final pathway.

The Case Study

In order to undertake this research an art and design Foundation Diploma (level 3), Further Education course, within a UK specialist art college was selected. This course was selected firstly due to the relatively large number of students within the course (90 students) and additionally as it was a one year course which was completing in the academic year 2013/2014. This course is located within a building that is away from the College’s main campus and the space is shared by no other groups or students. The majority of students join the course following A-levels, which

are completed at other institutions within the city. Within this course no use of Facebook or SMT was included as part of the formal learning programme.

Results: Facebook for Informal Learning and Peer Support

General Features of the Network SNA has demonstrated an average degree of centrality within this network of 11.129. The majority of students had a degree of centrality between 11 and 20. When displayed within a visual form using the Fruchterman Reingold algorithm (Figure 1) it becomes clear that the network is fairly well connected with even students on the periphery of the network having a number of connections. There are however a small number of students who sit on the periphery of the network who only have one or two connections. Within Figure 1 nodes with a high degree of centrality are coloured black with those with lower levels of centrality coloured white. Those with a middle level of centrality are coloured grey.

Figure 1: Gephi Visualisation of the Degree of Centrality within the network

Within this network, the average path length equals 1.8. This indicates that within this network any node is typically less than 2 degrees away from any other node. As the diameter of the network equals 5 this indicates that no node is more than 5 degrees away from any other within the network. A further aspect of the network, which it is interesting to consider, is the manner in which the network displays clustering. Figure 2 displays the clusters that exist within the network. This analysis

has been undertaken using a degree cut off of 2 and the KM Clustering algorithm. In this case, each cluster is represented by a different colour.

Figure 2: Gephi Network Visualisation using KM Clustering

From the clustering analysis, it is indicated that there are five clusters within this network. The largest cluster is comprised of 29 students, the second cluster is comprised of 15 students, the third is comprised of 13 students and the fourth and fifth clusters are comprised of 3 students each. This therefore indicates that within the network there are a number of distinct groups of nodes who have similar features to each other. This therefore demonstrates that the network is not homogenous. As the degree of centrality and clustering of the network have now been determined it is possible to overlay a number of factors onto the visualisations created in order to determine if any factors appear to be related to the degree of centrality of the nodes. The first factor that will be considered is the total number of Facebook friends each node has.

Specific Features of the Network

Figure 3 provides a visualisation of the degree of centrality of the network as seen previously but in this case, it is ranked by the total number of Facebook friends each node has with those nodes who have more total Facebook friends coloured darker and those with lower number coloured lighter.

Figure 3: Gephi Visualisation of network degree of centrality with ranking by total number of Facebook friends held by node

In terms of total number of Facebook friends, it would not appear that there is a significant differentiation between the centrality of those students who have a large number of Facebook friends and those that have lower numbers of total Facebook friends. This would therefore suggest that students are not more likely to be more densely located within the network if they are more active generally within Facebook. The next area to be considered is the manner in which attendance may influence the centrality of the network. Figure 4 represents the network visualisation of degree of centrality with attendance overlaid onto the network. In this case those with higher levels of attendance are coloured darker whilst those with lower levels are coloured lighter.

Figure 4: Gephi Visualisation of network degree of centrality with ranking by attendance at College

In this case, it would appear that there is some relation between level of attendance and location within the network. In Figure 4 it appears that those students with lower attendance are more likely to be located on the periphery of the network rather than centrally. It is not possible to view however from this analysis whether attendance is a predictor of location within the network or whether those students who are less central within the social network of the group is less likely to attend face to face sessions. The next area to be considered within this analysis is the final grade achieved by the student. Figure 5 displays the degree of centrality network, highlighted by the grade achieved by each student. Those who have achieved lower grades are coloured lightly with those who achieved higher grades coloured more darkly.

In this case, it would appear that this is some relation between the centrality of the network and improved performance on the course although this relationship is not very clearly displayed and is shown to be stronger through the data metrics within Gephi. Once again it is not possible to determine whether those students who are more central and socially linked to others within the course are more likely to achieve better grades or whether those with better grades are more likely to be more socially active but this visualisation does demonstrate that a relationship between these factors exists. The final area, which will be considered within this analysis, is the visualisation of the centrality of the network and those who failed to complete the course. Figure 6 displays those who left the course early as dark nodes and those who remained on the course as light nodes.

**Figure 5: Gephi Visualisation of network degree of centrality with ranking by grade achieved in course**

In Figure 6 it is clear that those who left the course early are on the periphery of the network although once again it is not clear whether the position of the nodes is due to the fact that students left the course early or left the course early due to the lack of centrality within the network. In relation to early leavers it is also interesting to note that a number of those who left the course early were either linked on the SNA with others that left the course or were linked with very few other students within the network. Three of the students that left the course early are for example only connected to one other person within the course. One of the students that left the course early was linked to three other students that also left the course early whilst another was connected to two other students that left the course early.

Discussion

From the results, it is clear that students are using Facebook extensively and that there is complex, invisible and organic social network that is formed within Facebook amongst students on the Foundation Diploma course within this case. Within the network it would appear that students are using Facebook in a range of ways as expected within the literature (Bosch, 2009) and there are students who are choosing to interact with Facebook in very limited ways or not at all, as well as those students who are very integrated within the social network.

It would appear from the results considering grades, attendance and early leavers that student use of Facebook does not have a detrimental effect on student performance within the course (Kirschner & Karpins, 2010; Junco, 2012, Bloxham, 2010). In reality those students who are more central within the network are more likely to stay on the course, achieve well and attend.

The manner in which total number of Facebook friends does not appear to affect the degree of centrality suggests that students are not necessarily building large diffuse networks and therefore will not have very high levels of bridging and bonding capital (Granovetter, 1983; Ellison, Steinfield & Lampe, 2007). The average degree of centrality seen within this research would also suggest that students are not seeking to build connection with large numbers of students. Bridging social capital may however enable students to reach across the network relatively easily given the average network path length and the diameter of the network.

Within this case study it has been demonstrated that students are using Facebook to socialise with others on their course and therefore with others with whom they already have some form of offline relationship (Munoz & Towner, 2011). It is not clear however whether these interactions are for social or informal learning reasons. Within this course there was no formal use of SMT and specifically Facebook and therefore it is important to consider that value the use of Facebook outside of the classroom may have for students. This supports the view that existing use of Facebook should be allowed to continue unabated, away from the formal education setting (Selwyn, 2009).

**Concluding comments**

This research has provided a unique insight into student group use of Facebook as a social and informal learning tool. This research has shown that students are using SMT extensively and are using such technologies to connect with others within their course. This research has also shown a positive link between student centrality when using Facebook and a number of key student success factors such as summative grade and leaving the course early. It is hoped that future research will utilise the methods employed within this study in order to further explore the results seen here and to further consider the manner in which SMT tools may be used to the maximum benefit of students in the future whether this is for social purpose, informal learning or formal learning.
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Introduction

In recent years, there has been an interesting technological shift occurring across much of the developed world in relation to the use of mobile devices. The use and ownership of not only smartphones but also internet-connected mobile devices such as tablets and laptops and personal mobile Wi-Fi devices has grown significantly. The growth in the use of such devices has resulted in the prediction that the number of internet enabled devices will be greater than the population of the world by the end of 2013. (Cisco, 2013) It is also predicted that this trend will continue with an expected production of 6.18 billion internet-enabled devices during 2014, up by 6 per cent from 2013. (IHS, 2014)

Within this context, it is unsurprising that established mobile vendors such as Apple and Microsoft, newer mobile vendors such as Amazon and Google and network providers such as EE, Three, Vodafone and O2 are now looking at the opportunities 4G will provide, particularly where competitive advantage can be gained for those who are first to market. This is leading to consideration of not only existing products such as smartphones but also new products such as tablets and laptops that are seen to now be generating significant Internet traffic. (Cisco, 2013)

What to date is less clear is the extent to which the introduction of 4G services and networks will affect the manner in which we work, socialise and study. This paper seeks to determine the extent to which 4G services may provide benefits to one of these key areas, the HE education sector, in relation to both teaching and learning and organisational effectiveness.

This paper shall report the findings from a case study of teaching staff that participated within a project funded by JANET. JANET is part of a UK government funded company (JISC) whose primary aim is to provide and develop network infrastructure to meet the needs of education and research communities. This project funded a trial of 4G network technologies during the Spring / Summer 2013 and participants were interviewed following the trial in order to seek their views of the benefits of 4G to the HE education sector. Before the results of the case study are discussed in more detail however a review of the existing literature shall be considered firstly in relation to 4G within the UK and secondly in relation to the use of 4G within the education sector.
Literature Review

It can be argued that the UK has fallen behind other countries in the development of 4G capabilities. Countries including Sweden, Denmark, Canada, Australia, Germany, USA and Japan (Knight, 2013) have all rolled out 4G at some point since 2008 (Tung, 2013). For the UK, whose inhabitants are amongst the biggest users of smartphones anywhere in the world (Davis, 2013), the introduction of 4G at the end of 2012 had seemed to have been a long wait. (Gradwell, 2012)

It is anticipated that now 4G has been launched that the rollout of services will be relatively rapid. EE planned to double the speed of its network within 10 cities by the summer of 2013. (Garside, 2013). By the end of 2014 EE had rolled out 4G to 300 towns and cities and had provided double speed 4G in 20 cities (4G, 2014). Overall average speeds on EE’s double speed network are indicated to be as fast as Sweden, the current fastest service in the world (Knight, 2013). If this is achieved the 4G network will be twice as fast as the average UK domestic broadband speed. (Garside, 2012)

It is this increase in speed that is considered to be one of the key advantages of 4G as this will be akin to an individual taking their home broadband connection with them wherever they are. (Tabbitt, 2013) This is even more likely to be achieved due to the manner in which spectrums were auctioned. As part of the condition of buying the 800MHz band 4G has to reach 98 per cent of the UK by 2017. (Woods, 2013)

With 4G initially only provided by EE and not yet extensively available outside metropolitan areas (EE, 2013) the likelihood that the frustrations that individuals currently have relating to failed 3G signals in rural areas or whilst on the train are likely to remain for the time being. (Gradwell, 2012) Some reports have also indicated that in practical tests there was no task that a 4G could perform better than 3G. (Garside, 2012) This may explain why some commentators believe that 4G take up has not gone as well as hoped. (Woods, 2013) For those that have been able to connect, 4G is considered to have made a huge difference to mobile usage. (Warman, 2013)

When compared to 3G the benefits of 4G are considered to be higher bandwidth, lower latency and greatly improved spectrum efficiency. (Place & Keeping, 2012) In this way 4G has the potential to radically alter the way in which we use mobile devices (Gradwell, 2012) allowing access to a greater number of applications in more locations and across more devices (Geer, 2012). It is important to note that whilst 3G is able to provide access to the Internet the connection speed and

reliability of the connection may be poor (Place & Keeping, 2012). Conversely however some users have reported that 4G is more reliable and better able to handle some tasks than some home broadband connections. (Tabbitt, 2013) Whilst these advantages are clearly beneficial when compared to 3G it is important to note that 4G is also reported to provide benefits in relation to Wi-Fi and broadband connections.

When compared to broadband, 4G is considered to be advantageous in the manner that it provides the ability for applications that need broadband speeds to be truly mobile, the improved convenience of ownership of the connection and the security that 4G offers. (Place & Keeping, 2012) The convenience of being able to use broadband speed Internet connections on the move has also not been achievable before (Warman, 2013).

When considering the implications of 4G it is important to consider not just improvements in relation to 3G but also if it may represent a replacement for Wi-Fi (Sawers, 2013). In this way, the introduction of 4G should not be thought so much as something that is changing mobiles but is changing the Internet (Warman, 2013).

It is important to note that 4G does not only refer to the use of smartphones but also to other devices such as tablets, laptops and Mobile Wi-Fi devices, also known as MiFi devices, which allow a connection to 4G via Wi-Fi (Phelan, 2013) The use and popularity of MiFi devices also demonstrates the way in which it is no longer “the norm” for individuals only have one mobile device but instead to have multiple devices which require an internet connection (Geer, 2012). In fact, the average household now reportedly now owns more than three internet-enabled devices with one in five owning six or more (OFCOM, 2013).

Whilst there can be seen to be benefits to the introduction of 4G services to the UK it is necessary to consider whether the introduction of such services will have an impact on the education sector. This will now therefore be considered in more detail.

The benefits of 4G discussed above would appear to make the new services offered attractive to HE institutions particularly when compared to 3G services. (Geer, 2012) The introduction of 4G is also considered to have come at a time when education is facing calls to change from a model which is considered to be unfit for 21st century learners (Cochrane, 2013). One of the ways in which learning is transformed with profound and far-reaching consequences (Corbeil & Valdes Corbeil, 2007) is through mobile learning and it is within this context that 4G will have the biggest impact. There are three key motivations for the use of mobile learning: improved access to education, the ability for mobile learning to change teaching and learning and finally
for mobile devices to enable the development of wider institutional and business objectives. (Kululska-Hulme, 2007)

It is the manner in which 4G seeks to provide almost universal coverage of the UK and allow us to do more no matter the location (Geer, 2012) that will be one of the major advantages for education. Teachers and learners will no longer be tied to their computers and broadband connections (Corbeil & Valdes-Corbeil, 2007; Traxler, 2007). The removal of location dependence will be important in two ways: Firstly, the provision of 4G will allow users to access learning resources and communication channels wherever they are. This may include locations when they wish to work independently including whilst travelling (Traxler, 2007) at home (Yang & Yang, 2011) or in any other location (Corbeil & Valdes-Corbeil, 2007). This particularly could be useful where time may otherwise be considered “wasted” such as commuting or absence due to sickness (Yan et al, 2012).

Secondly location is important as it will allow learning requiring or assisted by immediate access to Internet technologies to occur in context-specific locations (Traxler, 2007) such as fieldwork, (Yang & Yang, 2011) situated learning (Traxler, 2007) and work placement (Geer, 2012).

Whilst there are numerous benefits as a result of the ability to use internet technologies within differing locations and situations in reality the importance of this development is in the manner that there will no longer be the need to separate learning, particularly in vocational and occupational settings, between theory and practice as they can happen in the same place. (Attwell, 2007)

Whilst the ability to access learning in a range of new locations may provide new opportunities to existing learners it is also important to consider that the increased range of coverage that 4G purports to provide may also provide new opportunities for Institutions to offer distance learning to learners who may not have previously had a sufficient level of broadband to enable online learning to occur (Serrano-Santoyo & Organista-Sandoval, 2010). This may enable Institutions to reach a greater range of remote and rural areas than before. (Geer, 2012; Traxler, 2007)

In addition to location, time will no longer be a factor in using such devices. (Corbeil & Valdes-Corbeil, 2007) The effect of anytime access is expected to not only allow students to access course materials and content, (Yang & Yang, 2011) institutional data and other applications (Sprint, 2010) at any time of day, but will allow students and staff to communicate with each other more fully outside of the traditional learning environment (Yang & Yang, 2011).
It is the manner in which 4G will provide greater access to reliable, efficient and new communication and interactions systems which is considered to be one of the benefits of 4G (Serrano-Santoyo & Organista Sandoval, 2010) and may lead to new forms of collaboration (Yang & Yang, 2011). It is important however that, due to the manner in which 4G technologies are expected to change society itself (Traxler, 2007) it may be difficult to know how education may develop in the future or which tools and services may be available to us. Largely it is expected that the success and usage of 4G services will depend upon the individuals who are using the mobile devices and the degree to which staff and students consider the systems offered are useful and enhance learning (Corbeil & Valdes-Corbeil, 2007). It is therefore important that institutions encourage staff to consider the ways in which such technologies can be used in education (Corbeil & Valdes-Corbeil, 2007) and particularly within teaching and learning.

From the literature, it is clear that there are a number of key ways in which 4G is expected to be beneficial to the educational sector. Firstly, issues of the effectiveness of 4G must be considered such as the speed of connection and the coverage of the network. Both of these factors will affect the benefits that could be gained from the introduction of such services including the mobility of broadband equivalent connections and the ability to gain access in a range of locations.

If the rollout of 4G is successfully achieved it may then be possible for teachers and students to start to imagine some of the possibilities this technology may be able to provide to education such as any time / any place, access to education, transforming teaching and learning and other benefits. Each of these potential benefits shall therefore be considered in relation to a trial project currently underway within the UK HE sector.

Methodology

This research will utilise an exploratory case study approach. A case study approach is a qualitative research approach that allows the researcher to explore a phenomenon or topic within its context (Saunders, Lewis & Thornhill, 2012). It is considered to be a useful method when an in-depth and holistic approach is required. (Tellis, 1997) An exploratory case study is a method that is used effectively when there is no clear single outcome to the research being undertaken. (Yin, 2003)

A case study allows the researcher to collect a range of detailed information using a variety of methods over a period of time. (Creswell, 2009) The manner in which a case study approach allows the collection of data using multiple methods, which may
be qualitative or quantitative, also allows a triangulation of data that ensures a higher level of validity to the research. (Saunders, Lewis & Thornhill, 2012).

Whilst the validity is therefore considered to be high, generalisation is often an area that receives criticism within this approach. This is however refuted by proponents of this approach who consider that generalizability can be achieved when this approach is designed and used appropriately. (Tellis, 1997)

Further criticisms of a case study approach include that access to a suitable organisation can be difficult to gain, the process of research can be time consuming, the parameters of the research can be hard to define and that influences such as previous experience will play a part in the results but will not necessarily be understood by the researcher. (Collis & Hussey, 2003)

This case study utilised the opportunity provided by a six month 4G trial project funded by JANET. This project invited interested UK educational institutions to take part in a trial, which aimed to explore the potential use of 4G services within the UK educational sector. (JANET, 2013)

Participating institutions were given a number of MiFi devices that allow the connection of up to 10 devices to the 4G network via Wi-Fi. The aim of the trial from JANET’s perspective was to gain feedback relating to the connectivity and performance of the 4G services on offer and additionally to gain an understanding of the potential benefits and limitations of the services within the educational sector. (JANET, 2013)

Data collection for this case study was undertaken through semi-structured interviews with pilot participants who were invited to take part from a range of institutions. These were conducted via face-to-face interviews and via computer mediated asynchronous methods. Interviews were conducted with five participants within the pilot and the results of these interviews are reported below.

In addition to the interviews, data was collected via a quantitative survey of the speed of connections gained at differing locations across the UK. Participants captured these as they utilised 3G, Wi-Fi and 4G via the MiFi device during the trial.

Findings

In order to consider the findings of the pilot in relation to the literature four key areas will be covered. The first area of consideration will be the general effectiveness of the 4G services experienced within this study. General effectiveness of 4G services
Table 1 below demonstrates the speeds that have been achieved when using a range of connections across the UK.

Table 1: Connections speed gained across various UK locations tested with speedtest.net

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Time</th>
<th>Download (Mbps)</th>
<th>Upload (Mbps)</th>
<th>Ping (Ms)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G</td>
<td>19/06/13</td>
<td>20:40</td>
<td>0.89</td>
<td>0.00</td>
<td>179</td>
<td>London (4)</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>19/06/13</td>
<td>20:38</td>
<td>12.91</td>
<td>0.64</td>
<td>17</td>
<td>London (4)</td>
</tr>
<tr>
<td>4G</td>
<td>19/06/13</td>
<td>20:37</td>
<td>14.40</td>
<td>5.00</td>
<td>51</td>
<td>London (4)</td>
</tr>
<tr>
<td>3G</td>
<td>17/06/13</td>
<td>09:03</td>
<td>3.05</td>
<td>1.65</td>
<td>109</td>
<td>Plymouth (3)</td>
</tr>
<tr>
<td>Broadband</td>
<td>17/06/13</td>
<td>09:03</td>
<td>63.06</td>
<td>29.13</td>
<td>16</td>
<td>Plymouth (2)</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>17/06/13</td>
<td>09:03</td>
<td>50.99</td>
<td>28.80</td>
<td>17</td>
<td>Plymouth (1)</td>
</tr>
</tbody>
</table>

It is clear from the results seen in this table that currently the speeds offered by broadband and Wi-Fi far exceed those offered by either 3G or 4G. From this table, it is demonstrated that the current 4G speeds in fact exceed the 10 mbps expected in terms of download speeds. These speeds are therefore significantly greater than those achieved by 3G services on offer. These figures appear to be representative of speeds gained by participants across the trial. It is also important to consider user feedback that is received as a result of using the devices.

From the results, it would appear that access to 4G was mixed and in some cases staff appeared to be expecting 4G to be present in areas in which had not yet been provided. For example, some staff reported that they were surprised not to be able to gain a 4G signal in areas outside of London. One participant for example stated that they were able to receive a 4G signal in London.

“But not in Portsmouth, Bournemouth, Cornwall or parts of Plymouth.” (S1)

This therefore provides an indication that the way in which the rollout of 4G services has been undertaken by EE has not been fully understood by the general public and
could result in disappointment with the service on offer and a misconception that this is a reflection of the full service and will not improve.

It appears that staff also found the lack of a consistent 4G signal across the country frustrating, as a 4G signal would be lost whilst commuting. Providing a consistent and high level signal whilst travelling is expected to be one of the key advantages of 4G over 3G however as 4G is not as yet rolled out across the country staff were unable to experience this benefit:

“4G didn’t last for long on the train and after an initial period the rest of the journey was pretty much a black spot.” (S5)

Whilst there appear to be some frustrations in relation to accessing a 4G signal when staff were travelling across the country when staff undertook a commute that was entirely within a 4G area they indicated that access to the 4G network was relatively good and would remain fairly consistent throughout their journey:

“Yes, I can access 4G. There are a few areas it won’t work on route from Plymouth to Penzance but it’s never been an issue as I just do something else until it returns, and it does.” (S2)

It would appear that for the majority of participants the use of 4G is most beneficial when commuting or travelling as at home or within educational institutions Wi-Fi will be available and can be accessed relatively easily. Travelling does not necessarily only refer to commuting or journeys via train but also when visiting a different city:

“Bristol is the only place so far that I have visited that has a native 4G cell network. 4G worked very well there.” (S3)

However, where 4G was available there appear to be inconsistent views of its usefulness. It would appear that once again when staff were travelling, either commuting or away from the institution, they reported that 4G was fast and worked well:

“The speed of 4G from Bristol to Birmingham is amazing even on a moving train.” (S4)

One member of staff also reported that the MiFi device was useful when outside of the institution and within a 4G area for use with several internet-enabled devices at one time:
“When tested with three devices whilst on 4G in Bristol city centre it provided very fast simultaneous access.” (S3)

Other staff however felt that 4G did not provide something that could not be gained from Wi-Fi connections which would be made available either through Eduroam (a worldwide secure internet roaming access service) or via Wi-Fi which is often made available at hotels, events and a number of other locations:

“Most often the location that I ended up in would have Wi-Fi and I would find that to be as equally good as using 4G.” (S5)

This would therefore indicate either that 4G signals are not as yet at a sufficient speed to represent a significant advantage when compared to Wi-Fi. This is a comparable result to those seen in table 1 where broadband and Wi-Fi in Plymouth locations would represent a much faster signal that 4G would be able to provide although in London 4G represented a faster service. This again may indicate that the rollout of 4G services may at present provide inconsistency of experiences for those involved within this pilot. It does however appear that there is general agreement amongst the majority of participants that having access to 4G on the train is useful:

“Oh overall, it means I can stay in touch and on the pulse, all the time I’m on the train.” (S2)

“A good internet signal can make the train journey far more productive.” (S5)

Although it should be noted that at present the lack of coverage of 4G across the country has resulted in the majority of participants not having the opportunity to experience 4G throughout a train journey. Additionally, it should be noted that an increasing number of train operators are beginning to offer Wi-Fi services on trains and this may limit the usefulness of 4G during this time. One participant for example stated:

“If I was on a train with Wi-Fi though this probably would remove the need for 4G access.” (S5)

It would appear generally that staff felt that 4G devices were useful and did represent an improvement when compared to existing network connections but these were not considered to be an improvement in comparison to Wi-Fi:

“Once 4G becomes nationwide I can see it being useful as a general speed boost for any Internet activity one might need to partake of whilst away from Wi-Fi.” (S3)
Where Wi-Fi wasn’t, available staff appeared to embrace the opportunity to use 4G when it was readily available. One staff member commented:

“I love my device and it has literally change my life. I don’t think I can, or should, go without it,” (S2)

**Anywhere, any time access**

It would appear that staff did not give a great deal of consideration to the manner in which such devices may improve access to education. As staff were asked to mainly reflect on their personal usage this is not surprising. One member of staff did comment however that they felt that such devices would be useful for extending access to education:

“I am sure especially in terms of distance learning soon to be expanded within the institution.” (S1)

Whilst therefore there was little consideration of the widening of access to education, 4G may give, one respondent did comment that their access to online services had been improved substantially and this had resulted in students and colleagues being able to contact them more easily (S2). This respondent also comments that:

“I used to feel that it was “dead” time travelling before because we really need the Internet to do our job.” (S2)

This indicates the way in which the Internet is now becoming integral to academic work and therefore as a result the need for stable, consistent and good quality Internet connections are becoming increasingly important to educational institutions.

**Teaching and Learning**

In terms of teaching and learning it would appear that staff could see the benefits of using 4G as allowing new pedagogies and teaching approaches such as situated learning, work place learning and moving learning outside of the classroom environment:

“It will allow you to do anything you do indoors, outdoors. This will really change teaching and learning experience.” (S4)
“It’s also an excellent device to have in the classroom, or should I say in our outdoor classroom.” (S2)

One participant also suggested that the use of 4G devices when outside of the classroom could be useful for academic staff as it would allow students to connect to the internet via a device which is controlled by the academic member of staff and therefore students would potentially be protected via firewalls and other forms of internet security usually put in place through organisational IT departments:

“These specific devices could be useful for field trips where you want students to connect to the Internet through a controlled connection.” (S3)

It is important to note also that participants did not only appear to think of a single location in which such devices could be used but were considering a range of off-site locations which would allow students to gain new skills and learn in differing ways. This may suggest that new and differing approaches to learning may be created as a result of the ability to use digital technologies in new and differing locations:

“This will enable sessions to occur in a range of environments and allow students to have hand on experiences and learn from this.” (S5)

It would appear additionally that staff who had participated in the trial had in some cases discussed the use of such devices and had begun to trial them with students who were also stated as considering the devices to be useful:

“The students think it is a brilliant device for continuity and remote teaching.” (S2)

**Personal and Organisational Efficiency**

In relation to personal and organisational efficiency it appeared that amongst some staff that whilst the devices were considered to be interesting and a useful thing to have they did not feel that there was a huge benefit to the use of 4G:

“Probably not a life changing experience.” (S3)

“These devices haven’t really improved my efficiency. It’s been useful but it hasn’t really change things.” (S5)

This view was not held amongst all staff however and it would seem that amongst other staff the use of such devices had a real impact, made a significant difference to their work and was something that they would wish to keep following the trial:
“Extremely useful and something I should like to use permanently.” (S1)

“I love my device and it has literally changed my life. My time is now used efficiently and effectively. My productivity has been increased.” (S2)

Discussion

From the findings, it would appear that 4G is proving beneficial to individuals as predicted in the literature. (Warman, 2013) There does however appear to be a lack of understanding and some frustrations amongst respondents that 4G is not yet universal across the UK. (Gradwell, 2012) It also appears that staff did not see any major advantages in using 4G over Wi-Fi or that there were any benefits in using 4G if Wi-Fi was available. (Place & Keeping, 2012)

In relation to improved access to education it does appear that some respondents did note that the provision of 4G may aid in distance and online learning opportunities and this may suggest staff saw the opportunities 4G may give to reach a greater range of learners. (Geer, 2012; Traxler, 2007)

Staff who lived further away from the institution did consider 4G to be beneficial in allowing independent working whilst travelling (Traxler, 2007) and did state that this allowed other staff and students to respond and interact with them more easily. (Serrano-Santoyo & Organista-Sandoval, 2010; Yang & Yang, 2011) It would therefore appear that 4G did allow staff and students to be more flexible in their learning and in their work generally.

One of the major benefits staff appeared to identify was the ability of teaching and learning to occur at a range of new locations and particularly in non-traditional locations (Serrano-Santoyo & Organista-Sandoval, 2010) such as outside. This indicates that the provision of 4G within teaching and learning may allow the establishment of new forms of pedagogy and new teaching practices.

In relation to personal efficiency and effectiveness it would appear that as yet 4G technologies have not changed society. A number of staff appear not to consider 4G to have significantly change their working practices however this may be due to the current lack of availability of the 4G network across much of the country. These views may change as 4G is rolled out more fully. For those staff that appear to have access the use of 4G does appear to be advantageous and something which staff would wish to continue to use in the future. It also appears that the use of 4G may lead to the development of new forms of teaching and learning practice but until 4G...
is more universally distributed across the UK this is likely to only occur on a small scale.

Conclusions and Recommendations

This research has considered the affordances of 4G within the UK education sector. From the literature reviewed and the study undertaken it is clear that 4G within the UK is still evolving and coverage is currently limited. With this in mind however it would appear that the promises of such technologies are considered to be fairly high and there are expectations of changes to society as well as to education. In reality it would appear that 4G is something which staff found beneficial, particularly staff who face a daily commute. Benefits relating to teaching and learning are being considered by staff but as yet these have not been fully considered.

As 4G is rolled out across the UK and network speeds are increased further it is likely that the benefits identified above will become more pronounced and therefore a greater degree of interest will be shown in developing new forms of teaching and learning and approaches to education.

Future research may consider whether the expectation and use of 4G changes as it becomes a more mature and commonplace service and whether this has a fundamental impact on the manner in which teaching and learning is conducted in addition to the manner in which staff work and students learn.

References


The implications of a connectivist learning blog model and the changing role of teaching and learning

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Abstract
While the use of Web 2.0 tools and specifically blogs is becoming increasingly popular within higher education (HE) and has been shown to promote learning, relatively little is known about the manner in which such tools may affect how teaching and learning may change as a result of the use of such tools. It is within this context that a connectivist learning model was created and has been further developed within this paper in order to consider the implications of how the use of blogs may change the manner in which teaching and learning occurs. Within this research, a case study of the use of collective student blogs utilized as part of a formally assessed module, undertaken within an HE institution, is utilized to explore the manner in which teaching and learning can be seen to change through a connectivist learning model of blog usage. From this case study, it appears that connectivism does provide a theoretical model for the way in which teaching and learning may change as a result of the use of blogs by learners. However, the experience of staff and students who undertook the project suggests that while a number of elements of the connectivist model can be identified, these are not seen universally among all students.

Introduction
According to the Oxford English Dictionary (2014a), Web 2.0 is defined as the second stage of development of the Internet, characterized by the change from static web pages to dynamic or user-generated content and the growth of social media. Web 2.0 could also be defined, however, as web applications that erase the barriers between the production and consumption of information. The use of such web applications within the classroom could result in the reduction of these barriers to such a degree that they are almost eliminated entirely. Furthermore, Web 2.0 tools allow connections to be formed between learners, teachers, subject expertise and general audiences which are dynamic and allow information to flow in many directions, and as a result, learning can occur according to the learner’s needs, regardless of space or time.

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One aspect of Web 2.0, the use of blogs and social media within higher education (HE) teaching and learning, has become increasingly popular in recent years. According to the Oxford English Dictionary (2014b), a blog is defined as a website or web page which is personal and on which individuals, on a regular basis, record links to other sites and individual opinions. However, within this research, it is shown that blogs are also defined by the interaction and discussion that occur within them through activities such as posting, commenting, reading and replying.

As a result of the rise of blogs, much has been written concerning the manner in which such tools can be used to enhance teaching and learning (Duffy, 2008; Redecker, Ala-Mutka, Bacigalupo, Ferrari & Punie, 2009). What has been less clearly explored however is the manner in which such tools can fundamentally change the manner in which learning occurs and can change focus from formal training and instruction toward peer-to-peer learning and informal learning (Boud & Middleton, 2003). This occurs not only as a result of the use of technology but also as a result of the ability such tools have provided for this type of learning to occur. The changing focus of learning toward a greater range of ways in which learning can occur, particularly with the rise of Web 2.0 tools such as blogs, has led to the development of new forms of teaching, learning, pedagogy and learning theories.

One of the most relevant theories to come to prominence due to the rise of Web 2.0 is connectivism. Connectivism is not an area in which a great deal of empirical research has been conducted particularly in relation to the use of blogs within teaching and learning and the effect the use of such tools may have on both student and teacher roles (Garcia, Brown & Elbeltagi, 2013). The roles of both teacher and students are particularly important within a connectivist learning model as learning now occurs in a variety of ways and not just through formal lectures (Siemens, 2004). The implications of the changing nature of teaching and learning, as a result of
the use of blogs, are areas that require further investigation. This research shall therefore consider the further development of a connectivist learning blog model (Garcia et al, 2013) in which the theory of connectivism can be used to explain and assist in understanding how teaching and learning can be considered to change as a result of the introduction of Web 2.0 tools and specifically collective group blogs.

Before considering the extent to which blogs reflect a connectivist learning model and the manner in which a connectivist learning model affects teaching and learning roles, it will be first necessary to consider the nature of connectivism as a teaching and learning theory.

**Connectivism**

The learning theory of connectivism is most often attributed to the work of Downes (2005) and Siemens (2004) and was developed as a result of a belief that there was a need for a learning theory which took into account the manner in which society has changed as a result of the new technologies of the digital age (Siemens, 2004). The new technologies of the digital age can be seen to have affected teaching and learning in two key ways.

First, the rise of Web 2.0 tools, such as blogs, wikis and other collaborative tools, is affecting the manner in which learning can occur. This results in a greater two-way collaborative process and a less linear learning experience (Marhan, 2006, p 215).

Second, the digital age has resulted in an exponential growth in knowledge that can now have a much shorter half-life. In some cases, the relevance of knowledge can now be measured in months and years as opposed to centuries (Siemens, 2004). As a result of this proliferation, knowledge is becoming increasingly subsymbolic, distributed, interconnected and personal (Covello, 2010). Consequently, many learners are expected to move into a variety of different fields and be hybrid learners over the course of their working life (Siemens, 2004), resulting in the need for learners to be more agile and able to adapt to not only the changing knowledge and information received but also to understand the reasons and circumstance behind this change which is a lifelong continual process.

It is within this context that connectivism has come to prominence; in reality, it is not possible for an individual to acquire and experience all knowledge working independently, so instead, knowledge has to be obtained by forming connections with others (Marhan, 2006). The focus in a connectivist learning model is thus less concerned with the nature of knowledge as a commodity which is acquired as if it were a “thing” (Downes, 2007) and more concerned with the “know-where” as opposed to the “know-how” and “know-what” of traditional learning theories (Siemens, 2004). Additionally, within a connectivist model, knowledge is considered to be highly personalized and no longer something which is certain but is instead “tentative, fragmented, multifaceted, and not necessarily rational” (Kilgore, 2001, p 54). Within this model, individuals must learn to manage their knowledge through considering the validity of the knowledge transmitted by connections made. This leads to a highly learner-centered environment which can at times even result in individuals holding contradictory views of knowledge (Kilgore, 2001).

Within a connectivist learning environment, the use of networks to support informal information exchange is considered to be of increasing importance. Learners are considered to be able to significantly improve the efficiency of their learning when it is carried out within a network (Bessenyei, 2008). This is due to the fact that information is distributed across a number of connections, and it is in the ability to be able to construct and traverse these networks that learning occurs (Downes, 2007).

One of the key features of connectivism is that learners are able to use technology that has become available within the digital age to create networks for themselves, which are open and filled with information and knowledge sources that the individual chooses. Networks are
comprised of connections between “nodes” which can consist of individuals, groups, ideas, communities, systems, resources or fields (Bell, 2009). It is important to note that connections within this model must occur naturally through a process of association (Downes, 2007) and are not considered to be able to be artificially created or manipulated. The manner in which the individual creates the network results in the network being highly personalized to each individual student, and as a result, the maintenance and upkeep of the network must be the responsibility of that student (Guder, 2010). Consequently, individuals are required to filter information when building their network, deciding what is of most importance. The ability of learners to additionally be able to judge when a network may no longer be useful is also a vital element of connectivism (Siemens, 2004).

It is clear within connectivist learning that the individual and their network are of key importance. This is partly due to the manner in which connectivism considers how distributed cognition occurs. Distributed cognition assumes that no individual or device has all the information required to complete a task, and therefore, information must be spread across a network (Boitshwarelo, 2011). This appears to suggest a fundamental change in the role of teachers and learners within a connectivist learning model. Within connectivism, learning is seen to occur when peers collaboratively share opinions, viewpoints and critiques through conversation and dialogue on a more mutual basis than the traditional teacher/learner relationship (Friesen & Lowe, 2011). In fact, where teachers are present within a learner’s network (although this cannot be assumed), their role will be of a peer (Friesen & Lowe, 2011) rather than as an authority figure or source of absolute knowledge.

The nature of the networks formed also places the emphasis for making and choosing connections on the learner rather than the teacher (Guder, 2010). This places a greater emphasis on the learner’s role within the learning process, and where teachers are involved, their role will be determined by the learner rather than by the teacher themselves (Guder, 2010).

In addition, it is important to note that when learning occurs within a connectivist learning model, the manner in which students are responsible for learning allows learning to not only take place within the classroom but also outside of it. Often, this is made possible due to mobile digital technologies (Guder, 2010) and the connections formed with others who may wish to also continue to learn outside of the classroom. In this way, students may be encouraged to move beyond the boundaries of the institution and form connections outside of the institutional community (Bell, 2009).

While connectivism clearly has its advocates, its critics consider it to be less clearly applicable to learning and potentially lacking in rigor (Bell, 2011, p 98). Verhagen (2006) believes connectivism should be considered to be a pedagogy rather than a learning theory due to it being based at a curriculum level rather than an institutional level. This is a criticism that is further supported by Kerr (2007), who claims that there is something interesting happening but that this is not necessarily at the level of a learning theory. Bell (2011) also agrees that connectivism should not be considered a learning theory but proposes that it should be considered an influential phenomenon as it does not as yet have significantly enough qualitative studies to inform its development as a theory (Bell, 2011).

While critics do not consider connectivism as a learning theory, advocates consider that connectivism is a new form of learning theory and is an attempt to replace rather than complement existing theories (Bell, 2009) As a minimum, connectivism can be considered to reject some aspects of some traditional learning theories (Al-Shehri, 2011; Siemens, 2004) and to be influenced by other previous theories including social constructivism, network theory and chaos theory (Couros, 2009). Connectivism is therefore considered to represent a successor to theories such as cognitivism, constructivism and behaviorism (Al-Shehri, 2011). Connectivism is
considered by its advocates to better meet the needs of learners in the digital age than other theories as the majority of other learning theories concentrate on the individual aspect of learning, failing to consider learning which may occur outside the individual (Al-Shehri, 2011). By contrast, connectivism highlights the importance of learners making connections with others, which allows the flow of information and knowledge to occur between the learner and their learning community (Kop & Hill, 2008) and additionally through both human and nonhuman channels (Bell, 2009).

It is important to note however that the majority of learning theories are considered to be accurate only in some cases when certain conditions are met (Marhan, 2006). For example, constructivist approaches are considered to be applicable to learning new ideas or concepts, whereas rote learning is more applicable in compliance training (Marhan, 2006). Furthermore, Kerr (2007) considers that issues arise from connectivism when consideration is taken of “nonuniversals” which are skills that are not learnt spontaneously such as reading and writing. In terms of “nonuniversals,” the connectivist learning model does become difficult to apply, and relatively little consideration has been given to such issues to date. Despite these criticisms, connectivism still continues to be thought of as a new way of considering learning within the digital age (Boitshwarelo, 2011). In order to explore the manner in which a connectivist learning model may be a means by which to consider learning within the digital age, the effect that this model will have on teaching and learning roles will now be considered in more detail.

**Connectivism and changing teaching and learning roles**

If the principles of connectivism are considered to be valid, the manner in which learning occurs and is designed when a connectivist theoretical position is taken will clearly have implications for the roles of both teachers and students as the boundaries between them become increasingly ambiguous (Bessenyei, 2008). The manner in which learning and information management becomes primarily the responsibility of the learner results in the need for the teacher to think more carefully about how the learning environment is designed in order to ensure that learning is encouraged (Marhan, 2006). To this end, learners should be encouraged to connect to other people, organize themselves, create discussion groups and create communities of practice (Marhan, 2006). Learning can therefore in this environment occur in a much wider range of formal and informal ways.

The implication for teachers within connectivism therefore is that they are no longer playing a central role within the learning process once it has begun (Bessenyei, 2008). However, while this represents a shift in the power dynamics between the teacher and learner, the success of this approach will be dependent upon learners being sufficiently mature to be able to undertake this role and teachers being sufficiently confident to accept that their role may change (Marhan, 2006).

While the onus is now on learners to make connections and build their own networks, there is still an important role for teachers to play. Teachers need to ensure that learners are able and have sufficient skills to function in these new spaces, particularly in relation to knowing how to seek out and judge the importance of new information and fostering the development of new learning communities (Boitshwarelo, 2011).

The role of the teacher may also be affected by the manner in which learners will now be expected to seek out expertise from a range of sources, including external experts, alumni and people from other institutions (Bessenyei, 2008). The role of the teacher will therefore no longer be to be seen as the single source of expertise and knowledge. Students will instead be encouraged to seek opinions from a range of sources although teachers will still remain as authority figures both before and after the learning activity. Teachers will for example still be required to set the task and
Connectivism and blogs

The use of blogs, as previously defined, would appear to support a connectivist learning model due to the manner in which blogs are considered to provide opportunities for individuals to collaborate and communicate online with others (Richardson, 2010). Furthermore, blogs enable the creation of social structures (Efimova & Hendrick, 2005) particularly where collective blogs are used as a learning tool.

Collective blogs, as opposed to individual blogs, are important as they provide opportunities for key connectivist learning activities to occur, such as allowing interaction (Ferdig & Trammell, 2004) and peer and social communities to be promoted to support learning (Glogoff, 2005) and have a continuity of conversation (Macduff, 2009). While the use of blogs can be seen to meet the needs of a connectivist learning model, it is important to consider the effect this will have on teaching and learning roles.

Figure 1 provides a detailed conceptual model of connectivist learning within a collective blogging environment (Garcia et al., 2013). This model consists of three layers in which individuals may become involved in the process of connectivist learning within a collective blogging environment. It is important to consider each of the layers within this model as learning based on the activities that occur within this model could occur within each layer of the model and could occur in both formal and informal ways. For example, even those who are outside of the blog learning community and those who are simply observing the activity may get value and learn from the community. The community itself will also receive value from knowing the blog is of interest to
others and has reached external audiences. In this way, again, it is shown that the connectivist learning blog model will change the role of learners so that they are not only responsible for their own learning but also become an active member in the learning community supporting all of those involved in the community. The degree to which this occurs is however likely to depend on the preferences of learners within the community.

Before the model is considered in more detail, it is important to note that any of the actors within this model may hold similar or differing roles within a range of differing communities enabling a complex and wide-ranging network of connected individuals to be formed through the use of blogs and other Web 2.0 technologies.

**Blog learning community**

The model shown in Figure 1 demonstrates how the connectivist learning model and nature of collective blogs enable students to become a community of learners through the interaction and discussion that happen within the blog not only between learners but also between learners, staff and external experts. It is proposed that this interaction and the nature of the community motivate students to be more responsible for their own learning and that of others within the community in addition to solving their own learning problems through discussion, interaction and reading of others experiences. This differs from a more traditional learning model in which teachers would be expected to take responsibility for learning. From the perspective of students, this could be successful in both the short and long term. Short-term success can be achieved through the creation of empowered students who will be able to continue to work within the designed workplace even where teams could be separated by both time and space. This however could create both challenges and opportunities from the perspective of the teacher as learners may require availability from the teacher to support and interpret activities on a flexible basis (Lujan-Mora & Juana-Espinosa, 2007). Furthermore, this also results in the need for learners to be able and comfortable with using blogging technologies because without confidence in using the technology, it is expected that there will be a lack of interaction within the blog, and as a result, the learning community will not be successful.

Within the connectivist educational blog model, the nature of interaction with external experts and audiences through collective blogs provides a learning medium through which the creation of a number nodes is able to connect to thousands of networks due to the online nature of blogs. This enables the enhancement of the connections among not only students but also allows external audiences, experts and teachers even when blogs are closed to the general public as individuals can be invited to participate within the community of learners. These diverse connections can also be enhanced by the anytime–anyplace nature of learning in this model (Garcia, Brown & Elbeltagi, 2012; Siemens, 2008). While external audiences, experts and teachers may become involved within the model, it is important to note that they will remain outside of the core blogging community and only the learners themselves will be the fully functioning members of the learning community. Teachers, experts and external audience will therefore sit outside of the blogging environment and will instead sit within the collective blogs’ teaching environment or external environment as shown in Figure 1.

**Collective blogs’ teaching environment**

The Collective blogs’ teaching environment is represented as the second layer within the model shown in Figure 1. Within this layer, teachers and other learners may reside. Individuals within the blog teaching environment may interact with the community or simply observe the community and the interactions that occur within it. It is important to note that while teachers will be expected to reside in this layer of the model, initially, in order for collective blogs and a connectivist approach to be adopted, teachers must firstly be willing and able to use such tools (Kvavik, 2005).
This is due to the manner in which it is usually the decision of the teacher to use the specific technologies within a teaching and learning session that there will be a need for teachers to have the appropriate information relating to these digital tools and their effectiveness in teaching and learning. However, teachers reside at the second layer of this model as while they may need knowledge of the technology being used in this model, control of both the digital and learning environment moves from teachers to students once blogs have been chosen as a method of teaching and learning. This therefore changes the role of both teachers and learners, particularly within collective blogs where students become accountable to each other rather than the teacher. The role of the teacher becomes concerned with ensuring that students are actively engaged and responding in a timely and relevant way to each other’s posts rather than replying directly themselves (Livingston, 2011). It should be noted however that this monitoring process could be hard for the teacher to achieve, especially if blogs are busy or large numbers of students are involved.

Collective blogs’ external environment
The final layer within the model relates to the collective blogs’ external environment. Within this layer, external experts and audiences may interact or observe the collective blog learning community through either synchronous or asynchronous means. It is important to note however that the decision to involve or invite external audiences and experts to participate or view the collective blog will reside with the learners themselves who, as previously stated, are in control of the blog learning community in this model. This should not suggest however that teachers could not seek to enhance learning by encouraging the invitation of external experts or audiences to the community. In fact, the teacher as facilitator could ask learners to invite internal or external expertise locally or globally to participate within the blogs, or learners themselves could invite external experts and audience to the blog. In both cases, this could add an another important dimension to the interaction of the formed learning communities. The inclusion of experts and audiences could also result in the learning process becoming multidimensional as all individuals involved within the blog may undertake learning to some degree. The nature of blogs and the ability to reach audiences across the Internet also allow students to focus on specific communities that may be most relevant to them. The manner in which students, staff and experts may interact within the connectivist learning blogging model is shown in Figure 1 and is provided to assist in the understanding of the relationships that exist within the blogging environment from a connectivist learning viewpoint.

The model created here and its key characteristics will now be used to consider a case study of connectivist learning using blogs.

Methodology
The research is undertaken using a qualitative approach. This approach is considered to be most useful in this case as it allows the collection of research data within a natural setting and seeks to gain an understanding of participants and the relationships that exist between participants (Saunders, Lewis & Thornhill, 2012).

According to Creswell and Clark (2011), the advantages of such an approach include the following:

• It aims to describe and interpret participants’ personal experiences of a phenomena.
• It allows participants to share their view.
• It provides a way of understanding a complex phenomena.
• It tries to understand the interactions between people.

This helps to ensure that the validity of the results is relatively high (Creswell, 2009).
Case study method
A case study is a qualitative research method, which allows the researcher to extensively examine a single instance of a phenomenon (Collis & Hussey, 2003). Case studies are a useful method where a researcher wishes to gain a detailed understanding of the context in which the phenomena is occurring (Saunders et al., 2012). One of the key advantages of a case study is the manner in which it can deal with a variety of evidence (Saunders et al., 2012), resulting in a more detailed view of the phenomena (Yin, 2009).

Case study
The Bachelor of Arts with Honors Degree Illustration course is a 3-year degree program, which runs at Plymouth College of Art. The use of collective student blogs occurs within a module called “Illustrative Practices” within the second year of the course. Within this module, a simulated work-based learning project called “The Great Editorial Race” runs for 3 weeks. This project requires students to work in groups to create a number of illustrations in a relatively short time span. The course team assigns teams, and each team is responsible for setting up a group blog within Google’s “blogger” blog platform. The use of “blogger” was chosen, as this platform was familiar to both staff and student having been used for the creation of individual blogs as part of the first year of study. Due to the previous use of blogs within the course, students were aware of the nature of blogging and the differing types of participation that can occur within a blog (ie, reading, writing and commenting). The collective blogs created were all private and not available to public audiences. In order to read or participate within the blogs, individuals would require an invitation from an existing blog/team member. In all cases, the learners were required to provide access to the blogs in use; however, the staff did not write posts or comment on the blogs and would instead simply observe the interactions and activity occurring. A total of six teams were created which were comprised of between six and seven members. Each was assigned by staff in order to be evenly distributed in terms of characteristics and performance.

The aim of the blog was to create a flexible, asynchronous online space in which students could post ideas, research and sketches, which could be commented on by others in the team before submission. This space would not be an area in which academic staff would actively participate as it was hoped that the blog would enable students to create an online community that would provide peer support and build on offline activities undertaken in the studio. Students did not have access to blogs within the classroom, and therefore, all interaction within the blog occurred outside of the classroom. All students participated within the blogs by joining the blog to which they were assigned, creating posts and leaving comments. It is not possible to assess the degree to which students read the blogs in this case.

It is important to note that students were shown examples by staff of collective group blogs from previous cohorts. Students were also briefed by staff on the manner in which the blog could be used to enhance communication and collaboration through the differing aspects of blogging, such as reading, writing and commenting, and how this had proven to be effective for student groups who had previously undertaken this project. Student were not however given information relating to connectivism or the changing roles that were expected to be seen in both staff and students as a result of the manner in which this project was conducted.

Data analysis
All 33 participants within the class were asked to participate in this research, and a total of 33 students and the full academic staff team (two staff) were asked to complete a survey, which utilized open-ended questions. A separate student survey and staff survey were created in order to reflect the differing roles undertaken by staff and students within the model. Copies of these surveys can be found in Appendix. In addition, the staff team wrote both personal and team
reflection throughout the project, and staff were interviewed following the project. Staff were included within the data analysis as their views were considered to be critical to the connectivist learning collective blog model and were considered to be able to give greater depth to how the learning process was conducted. Student surveys were returned from members of five of the six teams (IJ, TF, FFF, TI and WWSY). In addition, results from both staff interviews (STIN1, STIN2) and staff surveys (STS1, STS2) were received.

The qualitative data were analyzed using narrative analysis. This method was chosen as it allows an account of the experience individuals have to be told in a sequential manner. This provides an opportunity to explore events, which may be related to each other and which may provide an indication of areas of importance for researchers (Saunders et al., 2012). Narrative analysis was undertaken following the identification and agreement among the researchers on the key aspects of the connectivist learning collective blog model shown in Figure 1. Following this, the interviews and surveys were analyzed by all researchers in relation to each of the areas identified from the model in order to extract themes that were emerging from both staff and students. To increase the reliability and validity of the results and the analysis process, an intercoding process has been executed. For that, transcripts were given to all the researchers involved in this research to code individually. This resulted in a high percentage of similarity of codes. By undertaking narrative analysis individually, the researchers were able to consider commonalities and differences that existed between participants’ individual results, and patterns that emerged were then brought together (Fraser, 2004). The results of this research will be presented in the following section.

Findings

In order to consider the degree to which the use of collective blogs within this case study reflects the model shown in Figure 1, the results shall be considered in relation to each layer of the model starting with the collective blogs’ learning community and the creation of the blogging community, followed by the collective blogs’ teaching environment and finally the collective blogs’ external environment.

Collective blogs’ learning community

It is clear from both the interviews and surveys undertaken that both teachers and learners have had previous experience with the use of blogs. Blogs have been used as part of the course since the first year of the program using Google’s “blogger” platform, and staff appear to embrace the use of blogs within the course:

During the first few weeks on the Illustration Programme the (staff) team support all students in setting up blogs as a means of evaluating their practice. . . . Blogging is used in a variety of ways by both staff and students, from presenting module research to course marketing . . . By the time year two is underway blogging is familiar to the cohort . . . and this module opens up the potential of blogs as a means to give and receive peer feedback. (STIN1)

It is therefore clear that the technology in itself does not represent a barrier to the formation of a blog learning community as seen in Figure 1.

However, while teachers considered that blogs provided a useful and beneficial tool for undertaking group work and recommended this as a means of communication for the group, some students felt that other means of communication were more useful. This possibly indicates that the interaction between learners was not only being maintained through the blog learning community shown in Figure 1 and was instead also occurring through other means as well.

For a small minority of students, it appeared that a face-to-face communication was preferred to communicating using technology:

We tended to do more in class/face-to-face than on blog . . . we did (show really early ideas) in person so no point in doing on blog for the sake of it. (TI1)
For other learners, while communicating using technology was preferred, the use of the blog did not appear to be their chosen primary method of communication. Both Facebook and text messaging were stated as being the main methods by which some of the groups communicated and the networks were built. This may indicate that the blog learning community within Figure 1 was not successful in this case or represented only part of the community’s communication methods.

It is interesting to note that all teams discussed the use of a variety of forms of communication including face-to-face and other mediated methods, even where the blogs were considered to have worked well and were used successfully. The majority of learners did consider that the blogs did work well and enabled interaction and learning to occur:

We all used the team blog to display and discuss work as it progressed. It allowed us to critique each other and make suggestions. (TF1)

Teachers’ views additionally appear to reinforce these views with staff commenting that the use of blogs worked well and was easy for students within this context. While it appears that the technology does not represent a barrier to use for teachers or learners, and the use of technology in fact appears to be preferred by the majority of learners, the extent to which blogs allowed learners to create a community in which they were able to interact and support each other as expected in Figure 1 needs further consideration.

Creating a learning community
Within the connectivist learning model shown in Figure 1, the use of a blog should allow learners to create a learning community in which interaction is occurring and connections between individuals are being made resulting in the creation of a network of learners. From the surveys conducted, it would appear that through the use of collective blogs, learners did appear to make connections with others as would be expected in Figure 1.

The connections formed “. . . were very valuable . . . They were all positive and friendly and made you feel part of a team and not working all alone.” (IJ1)

Furthermore, it appears that learners found that the connections made and interaction that occurred within the blog provided a supportive environment in which critique, comment and constructive feedback were given, hence allowing learning to occur:

It was really helpful in deciding what improvements to make. (TF1)

It is reassuring. Letting me know I’m going in the right direction and am valued by the group. (FFF1)

However, while many of the learners reportedly made connections and interacted through the blog learning community as shown in Figure 1, there were some concerns expressed by learners that posts and responses often came from the same individuals. This may indicate that some learners within the blog learning community were observing or lurking rather than interacting as expected within the community:

Comments were usually from the same people it would have been nice to have feedback from all members. (WWSY1)

In some cases, students stated that there were some individuals who were not active at all:

Some members were active and some were not. It was the inactive that concerned me. (TF2)

However, while some learners noted that others within their group were inactive, it is important to note that inactivity was minimal and all learners did participate in the blog to some extent. It is therefore not so much a concern of nonengagement or a lack of connections being made between learners within the community that is of interest but instead the manner in which some learners considered this an issue. This provides a further indication that students are taking responsibility for both the learning community and their own and others’ learning as shown...
within Figure 1. This indicates that new roles are being formed within the community as a result of the use of blogs as predicted in the literature. From these comments, it is also clear that learners have not considered the relevance of observation or lurking within the blog learning community at any layer within the model shown in Figure 1. None of the learners suggested that individuals who may not be posting themselves may still be benefiting from reading others’ posts and comments and learning in this way. It should be noted however that learners that are not posting or commenting can be considered to have moved to the second layer of the model, the collective blogs’ teaching environment, rather than remaining within the blog community itself. It is interesting to note also that the manner in which the community is reliant upon one another to be successful may result in some learners encouraging others to utilize the blog even if they are not particularly interested in doing so.

This also highlights not just a lack of engagement but also a lack of timely engagement and learner concerns relating to the inability this gave the community to provide feedback:

A lot of people in our group didn’t post their work up on the blog until it had been submitted leaving no opportunity for other people from the group to suggest improvements. (WWSY1)

In this case, rather than lurking, there might be an indication that not all learners were actively engaged or interacting with the blogging community and may instead be residing within the collective blogs’ teaching environment layer of the model rather than in the blogging community layer. However, if enough learners are not actively engaged within the blog learning community layer, it is expected that the connections required for learning to occur will not be sufficiently strong within the communities created. Staff considered that the lack of engagement by some learners within the blog could affect the success of the project and the learning that occurs:

It is clear that some students learnt so much more from the blog than others largely because as a whole group they were ensuring the blogs worked effectively for them. There’s that moment when an effective online critiquing community is completely dependent on that need for that community to be fully engaged. (STIN1)

Furthermore, this lack of engagement may indicate that while some learners were taking responsibility for their own and in some cases the communities’ learning, this was not universal as would be expected in a connectivist learning model. The responsibility for learning within this model will now be considered in more detail.

Collective blogs’ teaching environment
Within the connectivist learning blog model (Figure 1), it would be expected that the responsibility for learning would reside within the community or with the individuals within the community. In this case, it does appear that in the majority, responsibility for learning did pass from teachers to learners as staff remained within the teaching environment and did not enter the learners’ collective blogging environment unless they were asked to do so. In all cases, staff were able to view the activity of the collective blog learners’ environment and therefore could intervene and comment if they considered it necessary to do so. Within the blogs observed, as expected in Figure 1, this did not occur, and teachers did not become members of the learners’ blogging community. It was considered that learners did provide feedback to each other which was considered to be constructive and useful:

We were all honest and appreciated useful feedback as to why certain things were not working. (WWSY1)

However, while this reportedly occurred in most cases, this success was not universal and did not occur automatically or immediately:

At first we were all too polite, but before the end we had relaxed a bit and were still positive, but offering proper feedback. (IJ1)
For some learners, the academic staff role was required initially within the project in order to initiate discussion and critical feedback:

We needed prompting to use it as more than a “look at what I’ve done!” blog and were giving each other constructive comments towards the end. (IJ1)

This appeared to be for some learners an issue of confidence in their own opinions and the ability to share their views with other learners. Learners were however able to invite teachers into the blog learning community initially, and as their confidence grew, they were able to rely less and less on teachers within the teaching environment and instead focus on other learners within the blog learning community.

I found the comments valuable but I think because of the ‘newness’ of the group it was a bit difficult to be completely honest. Also I’m sure that one’s opinions are only subjective, so I did not want to comment on the blog, lest it be misunderstood—would have preferred to discuss it in person with the others on a one to one basis. (FFF1)

From a teachers viewpoint, it is evident that academic staff felt their role within this project had changed from their usual role and a greater responsibility has been passed to the community and the students themselves. Staff did see themselves as existing outside the learners’ collective blog community and more within the wider teaching environment as seen in Figure 1. This therefore enables teachers to undertake a differing type of role, as the model would suggest:

The teaching team “played” the role of art director rather than tutor throughout. (STIN2)

In this way, academic staff considered that as learners established their networks and the collective blogs started to mature, the traditional teaching role was no longer needed or was as a minimum diminished to more closely reflect the role of the teacher shown in Figure 1.

We realized that we are no longer the first port of call for asking for advice and feedback (as students) have each other for feedback outside of the classroom and are able to get feedback on their own ideas through peer critique. (STS2)

Teachers therefore considered that learners were largely self-managing their learning and considered that

Students not only learn individual skills in terms of working to briefs but they also develop critical thinking and reflection skills in terms of critiquing their own and others work. (STIN2)

However, while this generally worked well, it did result in a loss of some degree of critical review that learners might receive as students were “sometimes just too polite” (STS1).

This reflects the views of learners who noted that peers were too polite and did not wish to be critical of each other, thereby indicating that full responsibility for learning had not entirely passed from teachers to learners. It does however appear that these issues decreased as the community strengthened its connections.

It is also interesting to note that the communities did not continue to be maintained online following the end of the project:

The blogs setup for the race were not continued after the game had ended . . . and most students returned to their own peer group of friends to discuss their work. (STIN1)

This may indicate that connections made were not strong or enduring or were perhaps not of high value to learners. Alternatively, however, within a connectivist learning model, this could be expected as the specific relevance of the network did not necessarily exist any longer, and so, learners choose to revert or build new more appropriate networks.

Collective blogs’ external environment

Within the connectivist learning model, it is expected that external experts and audiences will be invited to join the community when this is appropriate as shown in Figure 1. In this case, students did not feel it was appropriate to invite external experts or audiences to be part of the blog learning community.
As teaching staff had, within this model, become external to the learning community, it is interesting to note that students also did not invite teachers to become involved within the blog learning community. In fact, despite being able to seek advice from staff, relatively few students took the opportunity to do this:

Although students could approach staff for art direction whenever they wished only a handful of students took this opportunity consistently. (STIN1)

This demonstrates the manner in which teachers considered themselves to no longer be directly involved in the learning process. It appears that teachers instead remained in the collective blogs’ teaching environment as shown in Figure 1. This however does not indicate that teachers remained outside of the learning community entirely:

There was still a sense that we were still seen as authority Figures with the race—setting the work, judging the editorials, providing critical feedback. (STIN1)

While teachers were still part of the learning process, although not necessarily the learning community, external experts and audiences were not invited to join the learning community and did not feature as connections or an extension of the network within the learning community or as part of the learning process.

**Discussion**

From the findings, it does appear that there has been a shift in society in relation to the use of digital tools as suggested by Downes (2005) and Siemens (2004). In this case study the increased use of digital tools is shown through both staff and student willingness to use tools such as blogs (both teachers and learners had previously used blogs) but also the preferences both teachers and learners expressed to use digital forms of communication such as blogs, social networking sites and text messages.

It would also appear that the influence of teachers and their willingness to adopt blogging within their teaching was important in achieving the success of the blogs as although some learners indicated their preference for other forms of online or offline communication, the blogs were used in all cases. It is important to note that even when other forms of communication were used, this was in addition to the use of blogs and did not represent a replacement of the collective blog. This indicates the importance of teachers’ views when using such technologies within teaching and learning as would be expected in a traditional formal teaching model (Kvavik, 2005).

In relation to the creation of a community, in this case, the connectivist learning model as shown in Figure 1 is largely delivered through the use of blogs although connections are also enhanced through other online or offline forms of communications in some cases. Learners do appear, as the literature and connectivist learning model would suggest, to have been encouraged through the use of blogs to create connections with others (Kop & Hill, 2008) and share opinions, viewpoints and critiques through conversation and dialogue (Friesen & Lowe, 2011).

However, unlike the connectivist model shown in Figure 1, it is important to note that learner group interactions were not strong or as self-initiated as would be expected (Guder, 2010), and greater numbers of learners resided within the teaching environment layer of the model shown in Figure 1 rather than the learners’ blogging community layer. Networks did not grow significantly during the length of the project also as would be expected within this model (Siemens, 2004). It also does not appear that external audiences, experts, other learners or teaching staff were interacting with the community or observing the community’s interactions.

Therefore, it seems that academic staff did maintain an authoritative role within the learning process, and while not engaging within the blog, as would be expected within a connectivist learning model, they were still involved within the teaching environment as seen in Figure 1 and...
were looked to as an authoritative source of learning by students (Friesen & Lowe, 2011; Guder, 2010).

Additionally external experts and audiences were not invited to interact with or observe the community, suggesting that responsibility for engagement required to build the network (Kop & Hill, 2008) and blogging community did not occur in this case. This would indicate that this aspect of the connectivist learning model was not delivered or was not relevant in this case.

It would certainly appear that within this study, responsibility for learning and knowledge management did become more focused toward the learner and the peer group (Guder, 2010) who formed the blogging community; however, students did not appear to be able to fully engage with the level of peer critique and feedback that would to be required, although this did occur in some cases.

The teacher’s role appeared to largely relate to a role within the teaching environment shown in Figure 1. The main activities undertaken by the teacher concerned the creation of the learning opportunity and the judging of final work as opposed to the usual guidance teachers would give students throughout. This placed a greater emphasis on the need for peer assessment and feedback and students becoming accountable to each other rather than to the teacher (Livingston, 2011).

Learners who engaged within the blogging community appeared to benefit, particularly as confidence grew and critiquing became easier, as the social structures of the group were created (Efimova & Hendrick, 2005). Where some students failed to engage, staff noted that this negatively affected the learning of all within the group, demonstrating the need for a strong network to be created (Siemens, 2004). Within this case study, teachers did not check the engagement of learners and therefore self-managed groups, or the blogging community, needed to be accountable for themselves, something which students perhaps found hard to adapt to, especially initially.

Overall, it would appear that blogs do reflect many of the principles of the connectivist learning model shown in Figure 1 and largely was a successful model in this case. In terms of the learners role, the need for learners to take responsibility for their own learning and the creation of their own networks has, on the whole, occurred successfully in relation to the blogging community but not to wider networks, however, due to the blogging community learning did occur. Learners however still appeared to look to teaching staff as authority figures and appeared to do little to extend, manage or continue the network following the project, thereby reducing the extent to which a diversity of opinions can be used to aid learning (Siemens, 2004).

Within a connectivist learning blog model, the manner in which teachers would be expected to be indirectly involved in learners blogging communities or involved only as an invited participant did appear to occur to some extent but not entirely. Teachers were still required to play an authoritative role within the teaching environment, although there does appear to be a degree of greater freedom for academic staff to be removed from each individual student’s learning process and to be able to critique on a more formal basis. For teaching staff, this role allowed a greater focus for learners on the need for self-reflection and peer critique within the blogging community, and this in turn allowed teachers the opportunity to become removed from the individual learning process although not entirely from the blogging community.

Conclusions, recommendations and future research

This research has examined the manner in which staff and student roles can be considered to change when using a connectivist learning blog model as outlined in Figure 1. The model presented provides the first opportunity to consider the use of blogs within a connectivist learning environment and as a result has provided an opportunity to consider the use of blogs within teaching and learning from a new perspective. This study has found that the roles of staff and students clearly change as a result of the use of blogs, and these would largely appear to meet the expectations of a connectivist learning model but not entirely.
The implications from this case study would suggest that the use of blogs results in a learner role which is more focused toward seeking and providing peer critique, support and guidance, and as a result, there is a need for learners to be fully engaged and be willing participants within group learning. The learner role when using collective blogs therefore appears to meet the requirements of a connectivist learning environment as the learners’ role becomes increasingly concerned with self-management, knowledge management and network building within the context of the blogging community, and the need to take greater responsibility for individual learning, which does not necessarily occur naturally.

The implications of this model for teaching staff appear to be the way in which staff roles change as a result of the use of blogs in a connectivist model. Due to the changes seen in learner roles as a result of the use of blogs which creates conditions for a connectivist learning model, teaching staff become less involved in the individual learning process of each student and instead focus on providing the opportunities for learning and overall summative critique at the end of the task within the teaching environment. This change will also not necessarily occur naturally, and the implications of this will be that this role may need to be practiced and refined by teaching staff.

While the case study demonstrate that some elements of connectivism can be seen, it is clear that the roles identified were not adopted in all cases, particularly among learners. As a result, some learners may have failed to actively or fully engage with the project, and consequently, their level of learning may have been affected. This is likely to be resolved if the project were assessed, and this would need to be carefully considered in the future when setting such activities.

From this case study, it is possible to see that blog usage had a positive effect on the manner in which teaching and learning took place. However, this was a relatively a short project following which learners appeared to disengage with the blogs created. The implication of this case study therefore suggests a need for further empirical research to be conducted within this area.

Future research may consider the use of blogs within a longitudinal study, within other disciplines and with greater learner numbers. In terms of the connectivist learning model created, the use of blogs should be continued, and the use of external experts and audiences and self-organized groups could be utilized in order to further develop the positive changes seen as a result of the connectivist learning blog model.

References


Appendix

Staff survey questions
1. Why did you decide to run the project in this way?
2. How do you think your role changed as a result of running the project this way?
3. Did you play a role in creating connections?
4. Did you play a role in team building?
5. How big a part did the technology play within the way the students undertook the project?
6. Did students learn because of the technology used?
7. Were connections made between students?
8. If connections were made between students, did they remain in place after the project?
9. Did any of the students continue to use blogs after the project?
10. Do you feel you took on the role of a peer within the group?
11. Were students motivated to learn because of the use of technology?
12. Did the academic role of staff change because of the use of technology?
13. Did the student role change because of the use of technology?
14. Did all the students engage with the use of blogs?
15. Would you do anything different next time?
16. Has this affected the manner in which you generally teach?
17. Have the students been affected by this project long term?
18. What are the key benefits of learning in this manner?
19. What are the key disadvantages of learning in this manner?
20. Do you have any further comments?

Student survey questions
1. How well did you work together to achieve your goals?
2. Did all individuals participate in team blog equally within your team?
3. What were the consequences—positive or negative—of the way in which individuals participated in your team blog?
4. As a team, how did you try to ensure everyone participated in the team blog?
5. How did you assign roles and responsibilities to members of the team and what were they?
6. As a team, did you review how well you were doing and make any changes as a result?
7. What have you learned about Editorial Illustration?
8. What have you learned about your own strengths and limitations as an illustrator?
9. How can we improve the Great Editorial Race the next time we play?
10. Do you have any further comments?
Learning Within a Connectivist Educational Collective Blog Model: A Case Study of UK Higher Education

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Abstract: The use of Web 2.0 technologies and specifically blogs has become increasingly prevalent within the Higher Education (HE) sector within recent years as educators begin to maximise the opportunities such tools can provide for teaching and learning and to experiment with their usage in a wide range of context. The use of such technologies has been shown to promote learning (Garcia, Brown & Elbeltagi, 2012) however currently the manner in which these tools can be best used to promote teaching and learning is not entirely clear.

It is within this context that Connectivism, a learning theory for the digital age (Siemens, 2004) has been developed as a theory which aims to provide a model through which teaching and learning using digital technologies can be better understood and managed. Connectivism is however as yet still a relatively new learning theory and not without criticism. Therefore this theory must be considered more fully before it can be accepted fully as a learning theory for the digital age.

Within this research a case study of collective blog usage by students studying at an HE institution within the United Kingdom is utilised in order to explore the extent to which Connectivism can be considered to provide a sound theoretical model in which to base future teaching and learning activities of this sort. The views of academic staff and students are utilised in order to explore the extent to which the model of Connectivist learning can be applied to this case and demonstrate the complexities of considering teaching and learning in this way. The results of this study would suggest that Connectivism as a learning theory for the digital age is worthy of consideration and a number of elements of the theory can be seen within the activities undertaken however these are not seen universally across all groups involved within this project.

Keywords: blogs, connectivism, higher education, teaching, learning, Web 2.0, case study

1. Introduction

The use of Web 2.0 within Higher Education (HE) has become increasingly popular in recent years and consequently there is an increasing range of research concerning the manner in which Web 2.0 tools can be used to support teaching and enhance learning within HE. What has been less clearly articulated however is the manner in which such tools can fundamentally change the manner in which learning occurs and the effect this may have on academic staff, students and the learning experience itself. The changes seen can be considered to have occurred, not only as a result of the use of the use of technology itself but also due to the effect that the use of such technological tools may have on how both staff and students approach learning. This has led, particularly through the use of blogs, to the development of new forms of teaching, learning, pedagogy and learning theories.

One of the most relevant theories, to come to prominence due to the rise of Web 2.0 is Connectivism. Connectivism is not an area in which a great deal of research, particularly empirical research, has been conducted to date However the manner in which connectivism may be able to enhance our understanding of teaching and learning in the digital age, especially in relation to the use of collective blogs within teaching and learning, could be of fundamental importance. The roles of both academic staff and students are particularly important within a connectivist-learning model and therefore the views of both academic staff and students of the use of collective blogs within a connectivist-learning model is an area that requires further investigation.

Before considering the extent to which blogs reflect a connectivist-learning model and the manner in which this affects both teaching and learning, it will be first necessary to consider the nature of connectivism as a teaching and learning theory before considering the manner in which this will be reflected in the use of blogs for teaching and learning.
2. Connectivism

The learning theory of connectivism was developed as a result of a belief that there was a need for a learning theory, which took into account the manner in which society has changed as a result of the new technologies of the digital age. (Siemens, 2004) Connectivism therefore seeks to provide a point of differentiation between itself and other learning theories with which educators may be familiar. Connectivism also seeks to assist in the development of current practice in order that learning design in the future will be developed in such a way that learning through digital means will be an inherent consideration in any learning design. (Al-Shehri, 2011)

The foundations of Connectivism are driven by the influence of social constructivism, network theory and chaos theory (Couros, 2009) and highlights the importance of learners making connections, which allow the flow of information to occur between the learner and their learning community. (Kop & Hill, 2008)

Within a connectivist-learning environment, knowledge is considered to flow through a network which contains “nodes” which can be an individual, group, system, resource or community (Bell, 2009). Within a Connectivist model learners therefore use technology to create networks, comprised of a variety of nodes for themselves, which are open and filled with knowledge sources that the individual chooses. The manner in which networks are formed therefore make the network highly personalised and primarily the responsibility of the individual. (Guder, 2010) As a result individuals are required when building their network to consider which nodes are of importance and which are not. The ability of learners to additionally be able to judge when a network may no longer be useful are also vital elements of connectivism. (Siemens, 2004)

Within a connectivist-learning environment it is also important to note that the concept of distributed cognition is of high importance. Distributed cognition is the belief therefore that no single individual is in receipt of all required knowledge to solve a problem or complete an activity (Boitshwarelo, 2011) and this therefore highlights the importance of maintaining nodes, connections and a strong network. However whilst the knowledge held by each node is important it is important to note that within a connectivist-learning network the connections made between nodes should be primarily concerned with the ability to solve problems rather than the specific information held and therefore the network should be filled with contacts and resources rather than solely information. (Al-Shehri, 2011)

Siemens (2004) defines the key principles of connectivism as follows:

- Learning and knowledge can rest in diversity of opinion
- Learning is a process of connecting specialised nodes or information sources
- Learning can reside in non-human appliances
- Capacity to know is more critical than what is currently known
- Nurturing and maintaining connections is needed to facilitate continual learning
- Ability to see connections between thoughts, ideas and concepts is a core skills
- Currency is the intent of all learning activities
- Decision making is itself a learning process

It is clear within connectivist learning that the individual and their network is of key importance. In addition the nature of the network appears to support a fundamental change in the role of academic staff as when they are present within a learner network (although this cannot be assumed) their role will be of a peer. (Friesen & Lowe, 2011)

Within this approach learning is seen to occur when peers collaboratively share opinions, viewpoints and critiques through conversation and dialogue on a more mutual basis than the traditional teacher / student relationship. (Friesen & Lowe, 2011)

In addition it is important to note that within a connectivist-learning model learning does not only take place within the classroom but also outside of it, often made possible due to mobile digital technologies (Guder, 2010) and the connections formed with others who may wish to continue to learn outside of the classroom.
The nature of the networks formed also places the emphasis for making and choosing connections on the student rather than the teacher. (Guder, 2010) This therefore places a greater emphasis on the student’s role within the learning process and where it exists the teachers role will be determined by the learner rather than the teacher. (Guder, 2010)

This theory is however not without its critics. Verhagen (2006) has been critical of connectivism, as he does not consider it to be a learning theory as it is based at a curriculum level rather than an institutional level. Verhagen (2006) therefore believes connectivism should be considered a pedagogy rather than a learning theory. This criticism is further support by Kerr (2007) who considers that something interesting is happening but that this is not necessarily at the level of a learning theory. Furthermore Kerr (2007) also considers that issues arise from connectivism when consideration is taken of "non-universals" which are not things that can be learnt spontaneously such as reading and writing. Further criticisms are made of connectivism as, unlike other theories, it appears to be incompatible with other theories and can even be considered to reject other learning theories altogether. (Al-Shehri, 2011)

Despite these criticisms the concept of connectivism continues to be considered of relevance when considering learning within the digital age, which supporters of connectivism argue has not been considered by previous learning theories. (Bell, 2011)

3. Connectivism and blogs

The use of blogs would appear to support connectivist learning due to the manner in which blogs are considered to provide opportunities for individuals to collaborate and communicate online with others. (Richardson, 2010) Furthermore blogs enable the creation of social structures (Efimova & Hendrick, 2005) particularly where collective blogs are used as a learning tool.

Collective blogs provide many of the features considered to be of importance in a connectivist-learning model such as allowing interaction, (Ferdig & Trammell, 2004) peer and social communities to be promoted to support learning, (Glogoff, 2005) and a continuity of conversation. (Macduff, 2009) Collective blogs would appear to support the development of a connectivist-learning environment particularly as at the centre of connectivism is the concept that individuals will learn best when they are able to connect to a learning community, be able to both learn from others and help others to learn through dialogue and discussion within a group of individuals with similar interests and aims. (Boitshwarelo, 2011) Whilst the use of blogs can be therefore seen to meet the needs of a connectivist-learning model it is important to consider the degree to which academic staff and students will accept the use of blogs. If the use of collective blogs is incompatible with the needs of both academic staff and students it is unlikely that their adoption will be successful.

Initially it must be noted that in order for blogs and a connectivist approach to be adopted staff must firstly be willing and able to use such tools. (Kvavik, 2005) As it is usually the decision of staff to use the specific technologies within a session there will be a need for staff to have knowledge of such technologies. However whilst academic staff may need knowledge of the technology the manner in which control of both the digital and learning environment moves from staff to students is an important distinction to make within both student blogs and connectivist learning. This therefore changes the role of both staff and student, particularly within group student blogs where students become accountable to each other rather than the teacher. This therefore places the role of the teacher as one concerned with ensuring that students are actively engaged and responding in a timely and relevant way to each other’s posts rather than replying themselves. (Livingston, 2011) This could however be difficult to achieve if blogs are busy or large numbers of students are involved.

The connectivist model and nature of blogs also supports any time, any place learning which may suit students but may not be appropriate for staff who possibly might be unable to be available on a flexible basis. (Lujan-Mora & Juana-Espinosa, 2007)

One further aspect of blogging that would well support the connectivist-learning model is the manner in which external “experts” could become involved within the blog more easily than in an offline environment. It is important to also consider that as connectivism is concerned with individuals making connections for learning and therefore reducing isolation within learning (Boitshwarelo, 2011) the manner in which blogs will allow students to reach audiences across the Internet will both enable students to build as large a community as required whilst also focusing on specific communities and
niches that may be most relevant to the activity being undertaken. The manner in which students, staff and experts may interact within the connectivist-learning blogging model is shown in figure 1.

Figure 1 demonstrates the relationships that exist between students within the blogging environment and the manner in which staff and experts may input into the community but are not automatically involved within the learning environment. Within this model learners exist within the collective blogging environment and by the nature of the environment are all linked to each other through their ability to see each other’s posts and comments and respond to these freely. Outside of the blogging environment staff and external experts will exist. Both of these groups are shown outside of the blogging environment but are able to contribute to the blog if invited into the community by the learners. The level of this commitment will be determined the learners as existing members of the community but could range from simply viewing the activity being undertaken to full participation within the community as an equal participant.

It is important to note that all of the roles within this model may change over time and are not static or fixed. It is likely that roles will change across time and additionally that the number of participants, in terms of learners, external experts and staff, will differ for each community and depend upon the reason for the formation of the community and the expertise that each member of the community brings to the group.

![Diagram of Connectivist Educational Blog Model](image.png)

**Figure 1:** Connectivist educational blog model

In order to determine the extent to which this model represents a realistic interpretation of the use of blogging within teaching and learning, the case study of Plymouth College of Art (PCA) shall now be considered.

4. **Methodology**

The research is undertaken using a qualitative approach. This approach is considered to be most useful in this case as it allows the collection of research data within a natural setting and seeks to gain an understanding of participants and the relationships that exist between participants. (Saunders, Lewis & Thornhill, 2012)

According to Creswell and Clark (2011) the advantages of such an approach include:
- It aims to describe and interpret participant’s personal experiences of a phenomena
- It allows participants to share their view
- It provides a way of understanding complex phenomena
- It tries to understand the interactions between people

This therefore helps to ensure that the validity of the results is relatively high. (Creswell, 2009)

4.1 Case study method

A case study is a qualitative research method, which allows the researcher to explore phenomena within context. (Saunders, Lewis & Thornhill, 2012) Case studies are a useful method where a researcher wishes to gain a detailed understanding of the context in which the phenomena is occurring. (Saunders, Lewis & Thornhill, 2012) One of the key advantages of a case study is the manner in which it can deal with a variety of evidence (Saunders, Lewis & Thornhill, 2012). By using a variety of evidence a more detailed view of the phenomena can be considered. (Yin, 2009)

4.2 Data analysis

A total of 33 students and the academic staff team (2 staff) were asked to complete a survey, which utilised open-ended questions. In addition the staff team wrote both personal and team reflection throughout the project and were interviewed following the project. Student surveys were returned from members of five of the six teams (IJ, TF, FFF, TI and WWSY). In addition results from both staff interviews (ST1) and staff surveys (ST2) were received.

The results of both the interviews and qualitative written responses were analysed using narrative analysis. This method was chosen as it allows an account of the experience individuals have to be told in a sequential manner, which allows the opportunity to explore the events, which may be related to each other and which may provide an indication of areas of importance for researchers. (Saunders, Lewis & Thornhill, 2012)

5. Case study

The BA (Hons) Illustration course is a three-year undergraduate degree programme, which runs at PCA. The use of collective student blogs occurs within a module called “Illustrative Practices” within the second year of the course. Within this module, a simulated work based learning project called “The Great Editorial Race” runs for three weeks in which students are required to form an editorial team in order to answer a number of editorial briefs with varying requirements and deadlines. This project therefore requires students to work in groups to create a number of illustrations in a relatively short timespan. In order to complete the task, student teams are required to work together assigning editorials, choosing a team captain and each team is responsible for setting up a group blog. Within this instance of delivery of the project a total of six teams were created and members within each team were assigned by staff in order to be as evenly distributed as possible in terms of both student individual characteristics and individual performance.

The use of collective blogs were determined by staff to be useful following the voluntary use of a collective blog by one student team in a previously presented instance of this project. Academic staff also considered that all students would be familiar with the use of blogs due to their usage throughout the programme for Personal Development Plans (PDPs) and other course related activities. It should be noted however that collective blogs had not previously been utilised with this group of students and this therefore represented a new use of the technology for the majority of students.

Staff felt that the manner in which students had previously successfully used individual blogs and the example of usage of a collective blog in a previous instance of this project resulted in an indication that this would be a good manner in which students could manage this project. The advantages of the use of blogs were considered to be the manner in which they provide a flexible, asynchronous online space in which students could post ideas, research and sketches, which could be commented on by others in the team before submission. Although academic staff request to have access to each of the blogs at the start of the project this space would not generally be an area in which academic staff would actively participate as it was hoped that the blog would enable students to create an online community that would provide peer support and build on offline activities undertaken in the studio.
Staff requested all blogs should be created using “Blogger” as this was the blogging software that was most familiar to staff and students and had been the software which had been most widely used throughout the course.

6. Findings

6.1 Student views of learning within a connectivist blogging environment

From the qualitative surveys conducted it would appear that through the use of collective blogs students did appear to begin to form a network and the types of connections with others that would be expected within a connectivist-learning model:

“They were very valuable... They were all positive and friendly and made you feel part of a team and not working all alone” (IJ1)

Furthermore it appears that students found the network formed and the connections made within the blog provided a supportive environment in which critique, comment and provide constructive feedback which allowed learning to occur and assisted students to develop their work:

“It was really helpful in deciding what improvements to make.” (TF1)
“It is reassuring. Letting me know I’m going in the right direction and am valued by the group.” (FFF1)

In this way it would appear that students did consider there to be value in working in a network and there was a reduced feeling of isolation for students when completing their work. This appeared to be considered by students to be driven by the student rather than by academic staff and where feedback was given it appears that this was often considered to be constructive and useful:

“We were all honest and appreciated useful feedback as to why certain things were not working.” (WWSY1)

However whilst this reportedly occurred in some cases this success was not universal and did not occur automatically or immediately for all students indicating that students perhaps did not feel that building connections with networks was something which came naturally to all students:

“At first we were all too polite, but before the end we had relaxed a bit and were still positive, but offering proper feedback.” (IJ1)

For some students the academic staff were required and invited into the community initially within the project in order to initiate discussion and critical feedback:

“We needed prompting to use it as more than a “look at what I’ve done!” blog and were giving each other constructive comments towards the end.” (IJ1)

The reason for staff involvement appeared to be for some students an issue of confidence in their own opinions and the ability to share their views with other students.

“I found the comments valuable but I think because of the ‘newness’ of the group it was a bit difficult to be completely honest. Also I’m sure that one’s opinions are only subjective, so I did not want to comment on the blog, lest it be misunderstood – would have preferred to discuss it in person with the others on a one to one basis.” (FFF1)

Whilst therefore it appears that the connectivist environment and blogs appeared to work well for some students the success of the blogs was not universal. Whilst some blogs saw interaction from all of the group:

“Everyone actively left comments and feedback within good time” (TF1)

A number of students felt that posts and responses often came from the same students thereby indicating that the network formed was possibly not working as well as it should be and not all nodes within the network were playing a part in the knowledge creation and sharing process:

“Comments were usually from the same people it would have been nice to have feedback from all members.” (WWSY1)

“Some members were active and some were not. It was the inactive that concerned me.” (TF2)

This might therefore provide an indication that not all students were actively engaged or learning through the collaborative blog and therefore the connections required for learning to occur were not sufficiently strong. This manifested not just through lack of engagement but also through a lack of timely engagement. For example:

“A lot of people in our group didn’t post their work up on the blog until it had been submitted leaving no opportunity for other people from the group to suggest improvements.” (WWSY1)
Additionally in terms of connectivism it is perhaps surprising that some students found that the technology itself appeared to be a barrier to use and not all participants appeared to embrace the technology to its fullest extent:

“We tended to do more in class/face to face than on blog…we did (show really early ideas) in person so no point in doing on blog for the sake of it.” (T11)

The manner in which the connectivist-learning model is considered to be a learning theory for the digital age makes the lack of engagement with digital technologies, amongst students, surprising and perhaps indicate that the extent to which all students engage with digital technologies is not as high as would be expected with the “digital age”.

In fact it is important to note that whilst some students considered that face-to-face communication replaced online communications all teams discussed using a variety of methods of communication, both online and offline, throughout the project indicating that students are not solely reliant upon digital technologies with their studies.

Overall therefore from the perspective of a connectivist-learning model it appears that students found and made connections, although to varying degrees, within the collective team blogs created and were able to use these to learn to some extent.

“We all used the team blog to display and discuss work as it progressed. It allowed us to critique each other and make suggestions.” (TF1)

Whilst the views of students have therefore given insight into the way in which learning occurred through the use of collective blogs, further comprehension can be found from considering the manner in which staff felt both their own and student roles changed as a result of the use of collective blogs within a connectivist-learning environment.

6.2 Staff Views of learning within a connectivist blogging environment

From the results of the staff surveys it is evident that academic staff felt both their own role within this project, and the roles undertaken by students had changed from the usual roles taken within such a project:

“The teaching team “played” the role of art director rather than tutor throughout…. Although students could approach staff for art direction whenever they wished only a handful of students took this opportunity consistently.” (ST1)

In this way therefore the academic staff considered that the creation of networks and connections between students was successful and students were no longer seeing staff as:

“…Automatically the first port of call for asking for advice and feedback (as students) have to use each other for feedback outside of the classroom to get feedback on their own ideas through peer critique.” (ST2)

Lecturers therefore considered that students were largely self-managing their learning through the establishment of a learning network and considered that:

“Students not only learn individual skills in terms of working to briefs but they also develop critical thinking and reflection skills in terms of critiquing their own and others work.” (ST1)

However whilst this generally was considered to have worked successfully, academic staff did feel that the use of student-based networks did result in a loss of critical review that students might receive from academic staff, as they stated that students were “sometimes just too polite.” (ST2)

This therefore reflects the views of students who noted that peers were too polite and did not wish to be critical of each other and although it appears this became less of an issue as connections between individuals became strengthened through interaction staff noted that:

“The blogs setup for the race were not continued after the game had ended…and most students returned to their own peer group of friends to discuss their work.” (ST1)

This may therefore indicate that connections made were not strong or enduring or were perhaps not of high value to students. Alternatively however within a connectivist-learning model this may be the expected result of the ending of the project, as the specific relevance of the network did not necessarily exist following the end of the project. Following the completion of the project students may have chosen to revert to existing networks or to build new networks whether these are mediated through digital technology or simply face-to-face networks.
Within this case study academic staff did not consider themselves to become part of the learning network but instead remained on the edges of the learning process. In this case academic staff did not therefore become peers as may be expected within a connectivist-learning model. However whilst this is the case staff did not consider themselves to be removed from the learning process entirely but the role of staff became much more focused towards providing critical feedback and acting as an art director:

“There was still a sense that we were still seen as authority figures with the work – setting the work, judging the editorials, providing critical feedback.” (ST1)

Staff did express concern at the lack of engagement by some students within the blogging environment and were concerned that this could affect the success of the project and the learning that occurs. This is particularly a concern within a connectivist-learning model, as all nodes within the network are required to be effectively working together. It is only when all nodes are working together in this way that the true value from within the network, when considered from a connectivist-learning model, can be established as each node will hold knowledge that the others do not and this must be shared with others:

“It is clear that some students learnt so much more from the blog than others largely because as a whole group they were ensuring the blogs worked effectively for them. There’s that moment when an effective online critiquing community is completely dependent on that need for that community to be fully engaged.” (ST1)

Overall it would appear that academic staff considered that the use of collective blogs within this project did change, to some extent, the way in which both staff and students managed the learning process within this project and the roles and responsibilities for learning did appear to be affected by the use of collective blogs for student learning. This however does not appear to entirely meet the expectations of the connectivist model of learning. The implications of these findings shall therefore be considered in more detail in terms of the manner in which a connectivist-learning model can be applied as a result of the use of collective blogs within this case.

7. Discussion

From the findings it is clear that both staff and students consider that the use of collective blogs within this project had a fundamental impact, not only in terms of the increased opportunities the technology itself allowed for collaboration and interaction, but also in terms of the degree to which a connectivist-learning model can be applied when using collective blogs for learning.

For both staff and students a connectivist-learning model appeared to be largely delivered through the use of blogs, as students were empowered to create peer communities and communicate, collaborate and interact using technology. However unlike the connectivist model, it is important to note that student groups were not self-initiated and networks did not form or grow organically outside of the groups staff assigned. It could therefore be argued that the networks created were not formed using the conditions required of a connectivist-learning network and therefore could not be considered to be truly connectivist-learning networks.

The manner in which academic staff maintained an authoritative role within the learning process and whilst not engaging within the blog, as would be expected within a connectivist-learning model, were still looked to as an authoritative source of learning by students, also suggests that the connectivist-learning model was not entirely successful in this case. However whilst this should be noted, it would appear that within this model the responsibility for learning did become more focused toward the student and the network formed as would be expected within a connectivist-learning model. Whilst this is the case though students did not appear to be able to fully engage with the level of peer critique and feedback that appears to be required even though it did occur in some cases. Where peer critique and feedback did occur, it appeared to be of benefit to the student, particularly as confidence grew and critiquing became easier. Within this case study staff did not check the levels of engagement of students and therefore the groups were required to be self-managing. The need to be accountable for themselves and the learning of others is an important aspect of a connectivist-learning environment but something, which some students found hard to adapt to. Where some students failed to engage, staff noted that this negatively affected the learning of all within the group. This perhaps indicates that the connectivist-learning model, whilst not present in all cases here, is applicable to learning within this way as when the conditions of the connectivist-learning model were not present learning occurred to a lesser degree.
It is interesting to note when considering the nature of connectivism as a theory for the digital age that for academic staff the use of digital technology represented no barrier. This is indicated by the way that staff initiated the choice of such tools. It should be noted though that academic staff had no input into the blogs themselves. The manner in which the academic staff made the choice of the tool to be used would have required an understanding of the capability of the tool and a desire for usage of digital tools.

By comparison, for students, the use of technology did appear to represent a barrier to use, shown through the manner in which some students preferred to work in an offline manner. It is interesting to note that therefore the assumption that the digital age has resulted in the need for a new learning theory may be unsupported in this case.

Overall it would appear from this case study that collective blogs do reflect many of the principles of a connectivist-learning environment and largely were a successful model in this case. One key benefit was the manner in which students were required to take responsibility for their own learning and, on the whole, this led to students creating their own networks and connections. The networks created also appear to be have been relatively successful and learning did occur as a result. This was not however successful in all cases and students still appeared to look to staff as authority figures and appeared to do little to extend, manage or continue the network following the project. Whilst this may be partly expected within a connectivist-learning model, as it could be argued the network was no longer needed, some continued connections or use of online tools would have been expected if the model and network had been found to be useful to students.

8. Conclusions and recommendations

This research has examined the extent to which a connectivist-learning model can be considered to have enhanced learning from an academic staff and student perspective when using collective blogs to undertake a project. This study has found that the roles of staff and students clearly change as a result of the use of blogs and these would largely appear to meet the expectations of a connectivist learning model but not entirely.

The findings from this case study would suggest that the use of collective blogs in this way does result in the creation of a network which is more focused towards seeking and providing peer-critique, support and guidance however this only appears to occur fully when students are actively engaged and willing participants within group learning. In this case study, when viewed through a connectivist-learning perspective, it would appear that the student role in this model becomes increasingly concerned with the creation and self-management of the network and the need to take greater responsibility for individual learning. However this does not necessarily appear to occur naturally for students.

Due to the changes seen in student roles, it would also appear that academic staff become less involved in the individual learning process of each student and instead focus on providing the opportunities for learning and overall summative critique at the end of the task. This change will also not necessarily occur naturally and may need to be practised and refined by staff.

Whilst the changes in roles demonstrate that some elements of connectivism can be seen within this case study it is clear that the roles identified were not adopted in all cases, particularly amongst students. As a result some students may have failed to actively or fully engage with the project and consequently the degree to which they have developed their network and connections may have resulted in learning being affected. One method by which this is likely to be resolved if the project were formally assessed, however this would need to be carefully considered in the future when setting such activities as formal assessment could change the dynamics of the group and the fundamental nature of the activity.

From this case study it is possible to see that collective blog usage has had a positive effect on the manner in which the project was managed and the learning that took place which can be seen through a lens of connectivist-learning. However this was a relatively short project following which students appeared to disengage with the collective blogs created. The result of this case study therefore suggests a need for further empirical research to be conducted within this area.
Further research may consider the use of collective blogs within a longitudinal study, within other disciplines and with greater student numbers. In terms of a connectivist-learning model, the use of blogs should be continued and the use of external experts and self-organised groups could be utilised in order to further develop the positive changes seen in both student and staff roles and the manner in which both teaching and learning may be further developed using connectivism as a theory for the digital age.

References

Student use of Facebook for Informal Learning and Peer Support

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Abstract: As the use of Social Networking and Social Media Technologies (SNT) has become pandemic amongst young people (Tess, 2013; Falahah & Rosmala, 2012) there has been an increasing drive amongst educators and researchers to explore the ways in which SNT may be utilized within the classroom (Junco, 2012). Whilst there is therefore an increasing amount of literature available in relation to the use of SNT within the classroom it does not appear that there has been sufficient research considering the manner in which SNT results in the development of a complex, invisible and organic social network amongst students. When these networks exist outside of the classroom they may allow informal learning and peer support to occur. This paper utilises an empirical approach to explore the nature of these invisible networks and the degree to which the use of SNT by students outside of the classroom may provide support for student learning in relation to informal learning and social interaction. Additionally this paper seeks to determine if the use of Facebook by students may provide an indication of the likelihood of student success on their course. This study explores the use of Facebook through the use of a case study of one cohort (90 students) who are undertaking a one-year Foundation in Art and Design course within a specialist art college. This research utilises the technique of Social Network Analysis (SNA) in order to visualise the type of interactions that occur within the online network and the strength of these interactions (Dawson, 2008). Results demonstrate that within this case study the student group created a complex and interrelated network of connections through Facebook with some students clearly placed at the centre of the network and others on the periphery. It is also demonstrated that those students who are more central within the network are more likely to remain on the course and achieve their qualification. This paper demonstrates that SNA provides a useful and insightful way in which to visualize what would otherwise be an invisible network of connections made by students outside of the classroom. Furthermore this paper will provide an insight for teachers and researchers into the benefits of the use of SNT within education, which will have practical implications for the future use of SNT in teaching and learning.

Keywords: social media, case study, Facebook, teaching, learning

1. Introduction

The rise of Social Networking and Social Media Technologies (SNT) has resulted in reports that such technologies are now more important than ever before within our daily lives (OFCOM, 2014). The largest and most popular SNT is undoubtedly Facebook, which is reportedly utilised by 36 million unique British adult visitors per month who spend an average of 14.7 billion minutes using the site (OFCOM, 2014). Duggan et al (2014) reports that Facebook is particularly popular amongst young adults with 87% regularly using Facebook. It may therefore be assumed that Facebook is an important aspect of the majority of students’ daily lives (Deng & Tavares, 2013; Tess, 2013; Falahah & Rosmala, 2012; Madge et al, 2009).

Given the rise in popularity and widespread use of SNT amongst young people it is not surprising that an increasing number of educators are becoming enthusiastic about the potential use of SNT for teaching and learning (Selwyn, 2009). However whilst educators may be enthusiastic it is far from clear whether students wish for the use of SNT such as Facebook to be brought into the classroom.

This may therefore highlight the fact that educators do not understand the manner in which students are currently using SNT. As such we also do not as yet have a clear understanding of the complex, invisible and organic social networks, which are formed, outside of the classroom through SNT (Junco, 2012) but which may include informal use for educational purposes. It is clear therefore that before formal educational use of SNT such as Facebook is considered it will be necessary to have a greater understanding of the manner in which students are using such tools and to explore the existing educational value and implications of their use in relation to retention and success (Amador & Amador, 2014) for those students who are existing Facebook users.

This paper will consider the existing literature in relation to student use of SNT before undertaking an analysis using Social Network Analysis (SNA) to establish the degree to which students are already using SNT.
2. Literature review

It is reported that young adults are spending increasing amounts of their time online (Duggan et al., 2014) and one of the most popular online activities appears to be the use of SNT. Social networking sites are reported to be embedding students in complex and rich webs of interactions and social relationships (Borgatti et al., 2009). In fact Facebook is now believed to be so popular amongst students that it is considered to be an integral part of University social life (Deng & Tavares, 2013). However this view is not shared universally as there are undoubtedly young people who do not wish to use such technologies, for various reasons (Falahah & Rosmala, 2012). It is also important to note that students do not use Facebook in a homogenous way and usage can be varied (Bosch, 2009). In fact it has been suggested that those who do not wish to use such sites could feel excluded and possibly ostracised (Bloxham, 2010) from others within their communities due to the rise in the use of such technologies. Furthermore it is important to note that where students feel forced to participate in such sites feelings of anxiety, resistance and resentment can be felt (Deng & Tavares, 2013).

In terms of the effect on education of the general use of such sites there appear to be contradictory reports. Some commentators claim that young people using SNT find it harder to communicate in class, tend to be more distracted and have shorter attention spans than non-users (Bloxham, 2010). Additionally it is reported that the time students spend on Facebook and the frequency with which they use Facebook are negatively associated with engagement in educational activities (Junco, 2012). Furthermore for some educators Facebook is considered to be a distraction which poorly impacts on student academic performance and study time (Irwin et al., 2012). Other commentators however have suggested that the use of SNT by students can result in better learning performance (Deng & Tavares, 2013).

Research considering the effect of the use of Facebook on education is becoming increasingly popular and there appears to be increasing academic interest in the effect of SNT on student educational performance (Junco, 2012). Research to date has however reported limited and mixed results. For example, studies that consider the direct relationship between grades and the use of Facebook appears to suggest there is either no relation between the factors (Pasek et al., 2009; Kolek & Saunders, 2008) or that those students who use Facebook have a lower overall grade (Kirschner & Karpinski, 2010; Junco, 2012; Bloxham, 2010). The majority of these studies however use self-reported measures for both the measurement of grade and use of Facebook and results may therefore not be entirely reliable.

Whilst such results may discourage the use of Facebook amongst students it is important to note that the majority of studies undertaken to date have reported on non-educationally focused use of Facebook amongst students. In these cases the use of Facebook was more likely to related to social purposes rather than educational activities (Hewitt & Forte, 2006). The use of Facebook for social purposes will not be expected to raise grades and is more likely to relate to the development of student social skills. Whilst social skills may not be directly linked to education and learning it something which can be considered to be an important factor for student success (Junco, 2015). It is therefore the manner in which Facebook allows students to create meaningful online relationships and mature forms of communication that is of use and is resulting in Facebook becoming an integral part of student daily life (Madge et al., 2009). It is also important to note that another benefit of the use of Facebook by students is the manner in which some students are much more comfortable with online interactions than face-to-face interactions. Using SNT may therefore provide a means through which some students are more willing to state their opinions, disagree with others and are more attuned to the opinions of others (Deng & Tavares, 2013).

It is interesting to note also that the manner in which students use Facebook changes as they progress through their academic life. During the first stages of University it would appear that students use Facebook to build and maintain new friendships at a new Institution and connect with a new peer group (Junco 2015). Facebook during the initial stages of University is therefore considered by some studies to be the “social glue” that enables students to settle into University life (Madge et al., 2009). The use of Facebook in later periods of study is considered to be more related to supporting the interactions that occur between students as they face common problems related to negotiating their learning (Selwyn, 2009).

Whilst this appears to suggest Facebook allows new social interactions to occur it is important to note that activities mainly consist of the reinforcement of existing offline relationships rather than creating new relationships online (Munoz & Towner, 2011). These activities are closely aligned to the concept of social capital.
Engagement in Facebook has been found to closely relate to an increase in student social capital and especially so for those students that were low in life satisfaction or self esteem (Ellison, Steinfield & Lampe, 2007).

Social capital is broadly defined as resources, which individuals accumulate through the relationships they have with other people (Ellison, Steinfield & Lampe, 2007). Facebook is considered to be an online social space in which students are able to build and maintain social capital with others (Cheung, Chui & Lee, 2011) in two ways, firstly bridging social capital and secondly bonding social capital. Bridging social capital consists of a number of “weak ties” and as such supports the loose social ties that individuals have and allows users to maintain and create large, relatively diffuse networks from which a wide range of resources may be drawn (Ellison, Steinfield & Lampe, 2007). The concept of “weak ties” is most often attributed to Granovetter (1983) who considered that a weak tie between an individual and an acquaintance should be viewed as an important bridge between two densely knitted circles of close friends.

Bonding social capital meanwhile reflects the relationships individuals have with family and very close friends who represent “stronger ties” with an individual and consists of individuals who will be in a position to provide emotional support and access to less easy to find resources (Ellison, Steinfield & Lampe, 2007). Whilst strong ties therefore provide greater support to an individual it is the weak ties which allow an individual to receive a wider degree of information without which they would be confined to more provincial news and the views of family and close friends only (Granovetter, 1983).

Social capital is considered to be one of the positive effects of the use of Facebook by students, particularly for those individuals who may have difficulties in forming offline relationships (Ellison, Steinfield & Lampe, 2007). Facebook also is considered to lower barriers to interaction and encourage self-disclosure, which allow individuals to create and maintain large and diffuse networks of relationships relatively cheaply and easily (Ellison, Steinfield & Lampe, 2007). Facebook can therefore be considered to allow individuals to develop diffuse and extensive networks. It is necessary however to consider, in relation to education and students, whether such benefits could be extended from the personal into the academic realm (Bosch, 2009).

Whilst the use of Facebook for social purposes may not represent a formal form of teaching and learning it has been reported that the use of Facebook and resulting discussions that may occur amongst students will result in informal learning occurring (Madge et al, 2009). The indirect result of this informal learning will result in the creation of an informal learning community (Munoz & Towner, 2011) or knowledge community (Selwyn, 2009). Facebook can in fact be argued to represent a continuation of the informal discourse that have been a long term feature of student life within the Higher Education sector (Selwyn, 2009). It has been argued that Facebook can offer a platform from which students can adopt self-governed, problem-based and collaborative learning processes (Irwin et al, 2012). There does not however appear to be amongst researchers or academics a clear understanding of how students may develop these self-organised online communities and use such technologies to support self-directed learning that occurs beyond the classroom (Deng & Tavares, 2013).

Further benefits of Facebook use by students are considered to include: Students can gain support, information and ideas from others with whom they have a social relationship (Maghrabi, Oakley & Nemati, 2014); Students are able to use Facebook to contact classmates to ask questions about class activities (Munoz & Towner, 2011); Students are able to collaborate on assignments and projects online (Munoz & Towner, 2011); Students can connect with each other during holiday periods, share lecture notes or study notes, answer questions about the practical aspects of their University life and share learning materials they have found via the internet (Bosch, 2009). It is argued that activities such as these allow the construction of student engagement, which leads ultimately to academic gains (Junco 2012). In this way Facebook becomes more than solely a social network but additionally becomes an informal educational network for students (Madge et al, 2009).

The manner in which Facebook is being used and is reportedly of value to students has resulted in calls for the existing use of Facebook to be allowed to continue unabated, away from the formal education setting and to remain backstage (Selwyn, 2009). This view is supported even though some studies have reported that students would be willing to see Facebook incorporated into their academic lives (Irwin et al, 2012).

Overall there appears to be considerable debate concerning whether students wish to use Facebook for academic purposes. Whether students are willing to use Facebook for academic purposes or not, it is clear that studentstoday mainly use Facebook for social connectivity (Irwin et al, 2012). Jong et al (2014) for example...
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reports that whilst 81% of students state that they have experience of discussing educationally related issues on Facebook only 59% of students explicitly state that peer discussion of educationally related issue is a motive for using Facebook. There are also conflicting results in relation to whether students would wish to use Facebook for academic use. For example Hewitt & Forte (2006) report that 66% of students would consider the presence of tutors within Facebook would be acceptable. However Duggan et al (2014) report that 73% of students agreed or strongly agreed that they wished to keep their social and academic lives separate. Bosch (2009) meanwhile reports that students would prefer to conduct discussions via Facebook as opposed to institutional virtual learning environments due to reasons such as existing familiarity and user experience with Facebook. Overall it would appear that there is consensus that Facebook is generally considered to be most useful to students for firstly social purposes and secondly informal learning and it is not proven to be useful for formal learning (Madge et al, 2009).

The use of Facebook for formal learning is however something to which increasing attention is being given (Curtis, 2014; Sheninger, 2012; Pollara & Zhu, 2011). It would appear that a number of educators consider that, if used in an appropriate manner, SNT can have benefits which would be useful in an educational context. Key motivations for using Facebook within formal education included to “meet” students within their own space and additionally to utilise a site, which is already popular with students to provide students with learning materials (Bosch, 2009). SNT could for example benefit students by providing additional opportunities for them to enter new networks of collaborative learning (Selwyn, 2009), particularly collaborative student-led learning (Bosch, 2009) and to support collaboration and cooperative learning (Irwin et al, 2012) through the strengthening of weak ties and increased social bonding capital and bridging capital as discussed above.

Overall it would appear that whilst there has been interest in the use of Facebook as a formal educational tool, empirical research is largely still in its infancy and findings are at present inconclusive (Deng & Tavares, 2013; Falahah & Rosmala, 2012). In order to better comprehend the manner in which students are currently engaging with Facebook and the facilitating and debilitating factors that may affect the way in which Facebook is used by students (Deng & Tavares, 2013) a case study of a course group will be analysed using Social Network Analysis (SNA).

3. Methodology

This research is undertaken utilising Social Network Analysis (SNA) in order to predict the structure of the relationships that exist between social entities and the impact these relationships have on other social phenomena (Butts, 2008). This research also however utilises a case study approach due to the manner in which the collection of research data has been conducted within a natural setting and seeks to gain an understanding of participants and relationships that exist between participants (Saunders, Lewis & Thornhill, 2012).

3.1 Case study method

A case study approach is a qualitative research method, which allows the researcher to explore phenomena (Saunders, Lewis & Thornhill, 2012). Case studies are useful methodologies for occasions when a researcher wishes to gain an understanding of the context in which the phenomena is occurring. (Saunders, Lewis & Thornhill, 2012) One of the key advantages of a case study is the manner in which it can deal with a variety of evidence (Saunders, Lewis & Thornhill, 2012). By using a variety of evidence a more detailed view of the phenomena can be considered. (Yin, 2003)

3.2 Social Network Analysis (SNA)

SNA allows a real life social network, which consists of individuals connected to each other to be visualised by a mathematical object called a graph (Carrington, 2014). Within this graph individuals are represented as points on the graph known as “nodes” whilst the relationships between nodes are shown as lines known as “edges” (Carrington, 2014).

SNA provides an approach through which the overt interactions that occur, the strength of these interactions and the types of resources exchanged can be examined in order to better understand the formation and structure of such communities (Dawson, 2008). SNA is considered to be useful as it allows researchers to view the “totality” of the social network and the context in which nodes interact and therefore the “embeddeness” of social action (Hollstein, 2014).
3.3 Data collection

In order to capture the information required a list of all student names was obtained on a specific course group. This list was used to create a matrix of all students and the possible connections they could have with other students within the group. Each student’s name was then manually checked within Facebook and all connections were noted on the matrix. If student’s privacy settings prevented them, or their friends list, being visible publically they were excluded from the analysis. In total 86 out of 90 students were found to have accessible Facebook profiles. It is important to state that only information that was publically available within Facebook was utilised for this analysis and all students were over 18 years of age.

In addition to student names researchers were also able to capture additional information about student’s attendance, gender, age and current status on the course from the College’s Management Information department. Furthermore the Course Leader was able to provide details relating to student final grades and final pathway.

4. The case study

In order to undertake this research an art and design Foundation Diploma (level 3) Further Education course within a UK specialist art college was selected. This course was selected firstly due to the relatively large number of students within the course (90 students) and additionally as it was a one year course which was completing in the academic year 2013/2014. This course is located within a single building five minutes away from the College’s main campus and the space is shared by no other groups or students. The majority of students join the course following A-levels, which are completed at other institutions within the city. Within this course no use of Facebook or SNT was included as part of the formal learning programme.

5. Results

5.1 General features of the network

SNA has demonstrated an average degree of centrality within this network of 11.129. The majority of students had a degree of centrality between 11 and 20. When displayed within a visual form using the Fruchterman Reingold algorithm (Figure1) it becomes clear that the network is fairly well connected with even students on the periphery of the network having a number of connections. There are however a small number of students who sit on the periphery of the network who only have one or two connections. Within Figure 1 nodes with a high degree of centrality are coloured black with those with lower levels of centrality coloured white. Those with a middle level of centrality are coloured grey.

![Figure 1: Gephi visualisation of the degree of centrality within the network](image)

Within this network the average path length equals 1.8. This indicates that within this network any node is typically less than 2 degrees away from any other node. As the diameter of the network equals 5 this indicates that no node is more than 5 degrees away from any other within the network.

A further aspect of the network, which it is interesting to consider, is the manner in which the network displays clustering. Figure 2 displays the clusters that exist within the network. This analysis has been undertaken using a degree cut off of 2 and the KM Clustering algorithm. In this case each cluster is represented by a different colour.
From the clustering analysis it is indicated that there are five clusters within this network. The largest cluster is comprised of 29 students, the second cluster is comprised of 15 students, the third is comprised of 13 students and the fourth and fifth clusters are comprised of 3 students each. This therefore indicates that within the network there are a number of distinct groups of nodes who have similar features to each other. This therefore demonstrates that the network is not homogenous.

As the degree of centrality and clustering of the network have now been determined it is possible to overlay a number of factors onto the visualisations created in order to determine if any factors appear to be related to the degree of centrality of the nodes. The first factor that will be considered is the total number of Facebook friends each node has.

5.2 Specific features of the network

Figure 3 provides a visualisation of the degree of centrality of the network as seen previously but in this case it is ranked by the total number of Facebook friends each node has with those nodes who have more total Facebook friends coloured darker and those with lower number coloured lighter.

In terms of total number of Facebook friends it would not appear that there is a significant differentiation between the centrality of those students who have a large number of Facebook friends and those that have lower numbers of total Facebook friends. This would therefore suggest that students are not more likely to be more densely located within the network if they are more active generally within Facebook.

The next area to be considered is the manner in which attendance may influence the centrality of the network. Figure 4 represents the network visualisation of degree of centrality with attendance overlaid onto the network. In this case those with higher levels of attendance are coloured darker whilst those with lower levels are coloured lighter.

In this case it would appear that there is some relation between level of attendance and location within the network. In Figure 4 it appears that those students with lower attendance are more likely to be located on the periphery of the network rather than centrally. It is not possible to view however from this analysis whether attendance is a predictor of location within the network or whether those students who are less central within the social network of the group is less likely to attend face to face sessions.
The next area to be considered within this analysis is the final grade achieved by the student. Figure 5 displays the degree of centrality network, highlighted by the grade achieved by each student. Those who have achieved lower grades are coloured lightly with those who achieved higher grades coloured more darkly.

In this case it would appear that there is some relation between the centrality of the network and improved performance on the course although this relationship is not very clearly displayed and is shown to be stronger through the data metrics within Gephi. Once again it is not possible to determine whether those students who are more central and socially linked to others within the course are more likely to achieve better grades or whether those with better grades are more likely to be more socially active but this visualisation does demonstrate that a relationship between these factors exists.

The final area, which will be considered within this analysis, is the visualisation of the centrality of the network and those who failed to complete the course. Figure 6 displays those who left the course early as dark nodes and those who remained on the course as light nodes.

In Figure 6 it is clear that those who left the course early are on the periphery of the network although once again it is not clear whether the position of the nodes is due to the fact that students left the course early or left the course early due to the lack of centrality within the network.

In relation to early leavers it is also interesting to note that a number of those who left the course early were either linked on the SNA with others that left the course or were linked with very few other students within the network. Three of the students that left the course early are for example only connected to one other person within the course. One of the students that left the course early was linked to three other students that also left the course early whilst another was connected to two other students that left the course early.
6. Discussion

From the results it is clear that students are using Facebook extensively and that there is complex, invisible and organic social network that is formed within Facebook amongst students on the Foundation Diploma course within this case.

Within the network it would appear that students are using Facebook in a range of ways as expected within the literature (Bosch, 2009) and there are students who are choosing to interact with Facebook in very limited ways or not at all, as well as those students who are very integrated within the social network.

It would appear from the results considering grades, attendance and early leavers that student use of Facebook does not have a detrimental effect on student performance within the course (Kirschner & Karpinksi, 2010; Junco, 2012, Bloxham, 2010). In reality those students who are more central within the network are more likely to stay on the course, achieve well and attend.

The manner in which total number of Facebook friends does not appear to affect the degree of centrality suggests that students are not necessarily building large diffuse networks and therefore will not have very high levels of bridging and bonding capital (Granovetter, 1983; Ellison, Steinfield & Lampe, 2007). The average degree of centrality seen within this research would also suggest that students are not seeking to build connection with large numbers of students. Bridging social capital may however enable students to reach across the network relatively easily given the average network path length and the diameter of the network.

Within this case study it has been demonstrated that students are using Facebook to socialise with others on their course and therefore with others with whom they already have some form of offline relationship (Munoz & Towner, 2011). It is not clear however whether these interactions are for social or informal learning reasons. Within this course there was no formal use of SNT and specifically Facebook and therefore it is important to consider that value the use of Facebook outside of the classroom may have for students. This supports the view that existing use of Facebook should be allowed to continue unabated, away from the formal education setting (Selwyn, 2009).

7. Conclusions and recommendations

This research has provided a unique insight into student group use of Facebook as a social and informal learning tool. This research has shown that students are using SNT extensively and are using such technologies to connect with others within their course. This research has also shown a positive link between student centrality when using Facebook and a number of key student success factors such as summative grade and leaving the course early.

It is hoped that future research will utilise the methods employed within this study in order to further explore the results seen here and to further consider the manner in which SNT tools may be used to the maximum benefit of students in the future whether this is for social purpose, informal learning or formal learning.

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The Affordances of 4G Mobile Networks Within the UK Higher Education Sector

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Abstract: Although 4G mobile networks have been available within twelve countries such as the USA, Japan and Germany since 2008 (Tung, 2008) the United Kingdom (UK) has been somewhat slower to adopt these technologies. It is not surprising therefore that the launch of 4G services within the UK in August 2012 has been subject to much publicity particularly as it is stated that the UK will have the world’s fastest 4G network with coverage across 98 per cent of the country by the end of 2014 (Garside, 2013) This paper seeks to determine the affordances to the Higher Education (HE) sector of the rollout of 4G services across the UK. Affordances are considered within the existing literature to include factors such as an ability to study in an any time, any place manner, improved access to education, particularly for those in remote and rural areas and a transformation of teaching and learning. The degree to which these benefits will impact upon the manner in which mobile technologies are used within the UK HE sector will be discussed through the use of a case study of teaching staff who have taken part in a trial of 4G devices provided by EE as part of a Janet funded project. From this study the affordances of the use of 4G mobile technologies are seen to relate to key areas such as the general effectiveness of 4G services, any time, any place access, the transformation of teaching and learning and personal and organisational effectiveness. Overall this paper concludes that teaching staff can envisage significant affordances to the HE sector as a result of the adoption of 4G technologies within the UK although full benefits will not be realised until the network is fully evolved and accessible to all.

Keywords: 4G, mobile learning, higher education, teaching and learning, case study

1. Introduction

In recent years there has been an interesting technological shift occurring across much of the developed world in relation to the use of mobile devices. The use and ownership of not only smartphones but also internet-connected mobile devices such as tablets and laptops has grown significantly. The growth in the use of such devices has resulted in the prediction that the number of internet-enabled devices will be greater than the population of the world by the end of 2013. (Cisco, 2013)

Within this context it is unsurprising that mobile vendors such as Apple and Nokia and network providers such as EE are now looking at the opportunities 4G will provide, particularly where competitive advantage can be gained for those who are first to market. This is leading to consideration of not only existing products such as smartphones but also new products such as tablets and laptops that are seen to now be generating significant Internet traffic. (Cisco, 2013)

What is to date less clear is the extent to which the introduction of 4G services and networks will affect the manner in which we work, socialise and study. This paper seeks to determine the extent to which 4G services may provide affordances to one of these key areas, the HE education sector, in relation to both teaching and learning and organisational effectiveness.

This paper shall report the findings from a case study of teaching staff who have participated within a Janet funded 4G trial during the Spring / Summer 2013 and who have been interviewed to seek their views of the affordances of 4G to the HE education sector. Before the results of the case study are discussed in more detail however a review of the existing literature shall be considered firstly in relation to 4G within the UK and secondly in relation to the use of 4G within the education sector.

2. 4G within the UK

It can be argued that the UK has fallen behind other countries in the development of 4G capabilities. Countries including Sweden, Denmark, Canada, Australia, Germany, USA and Japan (Knight, 2013) have all rolled out 4G at some point since 2008 (Tung, 2013). For the UK, whose inhabitants are amongst the biggest users of
smartphones anywhere in the world (Davis, 2013), the introduction of 4G at the end of 2012 had seemed to have been a long wait. (Gradwell, 2012)

It is anticipated that now 4G has been launched that the rollout of services will be relatively rapid. EE plans to double the speed of its network within 10 cities by the summer of 2013. (Garside, 2013). Overall average speeds on EE’s network are predicted to then be as fast as Sweden, the current fastest service in the world (Knight, 2013). If this is achieved the 4G network will be twice as fast as the average UK domestic broadband speed. (Garside, 2012)

It is this increase in speed that is considered to be one of the key advantages of 4G as this will be akin to an individual taking their home broadband connection with them wherever they are. (Tabbitt, 2013) This is even more likely to be achieved due to the manner in which spectrums were auctioned. As part of the condition of buying the 800MHz band 4G has to reach 98 per cent of the UK by 2017. (Woods, 2013)

With 4G currently only provided by EE and not yet generally available outside major metropolitan areas (EE, 2013) the likelihood that the frustrations that individuals currently have relating to failed 3G signals in rural areas or whilst on the train are likely to remain for the time being. (Gradwell, 2012) Some reports have also indicated that in practical tests there was no task that a 4G could perform better than 3G. (Garside, 2012) This may explain why some commentators believe that 4G take up has not gone as well as hoped. (Woods, 2013) For those that have been able to connect, 4G is considered to have made a huge difference to mobile usage. (Warman, 2013)

When compared to 3G the benefits of 4G are considered to be higher bandwidth, lower latency and greatly improved spectrum efficiency. (Place & Keeping, 2012) In this way 4G has the potential to radically alter the way in which we use mobile devices (Gradwell, 2012) allowing access to a greater number of applications in more locations and across more devices (Geer, 2012). It is important to note that whilst 3G is able to provide access to the Internet the connection speed and reliability of the connection may be poor (Place & Keeping, 2012). Conversely however some users have reported that 4G is more reliable and better able to handle some tasks than some home broadband connections. (Tabbitt, 2013) Whilst these advantages are clearly beneficial when compared to 3G it is important to note that 4G is also reported to provide benefits in relation to Wi-Fi and broadband connections.

When compared to broadband, 4G is considered to be advantageous in the manner that it provides the ability for applications that need broadband speeds to be truly mobile, the improved convenience of ownership of the connection and the security that 4G offers. (Place & Keeping, 2012) The convenience of being able to use broadband speed Internet connections on the move has also not been achievable before (Warman, 2013).

When considering the implications of 4G we therefore need to consider not just improvements in relation to 3G but also if it may represent a replacement for Wi-Fi. In this way the introduction of 4G should not be thought so much as something that is changing mobiles but is changing the Internet. (Warman, 2013)

It is important to note that 4G does not only refer to smartphones but also to other devices such as tablets, laptops and MiFi devices which allow connection to 4G via Wi-Fi (Phelan, 2013) The use of MiFi devices also demonstrates the way in which it is no longer “the norm” that individuals only have one mobile device but instead may have multiple devices. (Geer, 2012)

Whilst there can be seen to be benefits to the introduction of 4G services to the UK it is necessary to consider whether the introduction of such services will have an impact on the education sector. This will now therefore be considered in more detail.

3. The use of 4G within the education sector

The benefits of 4G discussed above would appear to make the new services offered attractive to HE institutions particularly when compared to 3G services. (Geer, 2012) The introduction of 4G is also considered to have come at a time when education is facing calls to change from a model which is considered to be unfit for 21st century learners (Cochrane, 2013). One of the ways in which learning is transformed with profound and far-reaching consequences (Corbeil & Valdes-Corbeil, 2007) is through mobile learning and it is within this
context that 4G will have the biggest impact. There are three key motivations for the use of mobile learning; improved access to education, the ability for mobile learning to change teaching and learning and finally for mobile devices to enable the development of wider institutional and business objectives. (Kululski-Hulme, 2007)

It is the manner in which 4G seeks to provide almost universal coverage of the UK and allow us to do more no matter the location (Geer, 2012) that will be one of the major advantages for education. Teachers and learners will no longer be tied to their computers and broadband connections (Corbeil & Valdes-Corbeil, 2007; Traxler, 2007). The removal of location dependence will be important in two ways: Firstly the provision of 4G will allow users to access learning resources and communication channels wherever they are. This may include locations when they wish to work independently including whilst travelling (Traxler, 2007) at home (Yang & Yang, 2011) or in any other location. (Corbeil & Valdes-Corbeil, 2007). This particularly could be useful where time may otherwise be considered “wasted” such as commuting or absence due to sickness (Yan et al, 2012).

Secondly location is important as it will allow learning requiring or assisted by immediate access to Internet technologies to occur in context-specific locations (Traxler, 2007) such as fieldwork, (Yang & Yang, 2011) situated learning (Traxler, 2007) and work placement (Geer, 2012).

Whilst there are a numerous benefits as a result of the ability to use internet technologies within differing locations and situations in reality the importance of this development is in the manner that there will no longer be the need to separate learning, particularly in vocational and occupational settings, between theory and practice as they can happen in the same place. (Attwell, 2007)

Whilst the ability to access learning in a range of new locations may provide new opportunities to existing learners it is also important to consider that the increased range of coverage that 4G purports to provide may also provide new opportunities for Institutions to offer distance learning to learners who may not have not had a sufficient level of broadband (Serrano-Santoyo & Organista-Sandoval, 2010). This may enable Institutions to reach a greater range of remote and rural areas than before. (Geer, 2012; Traxler, 2007)

In addition to location time will no longer be a factor in using such a device. (Corbeil & Valdes-Corbeil, 2007) The affect of any time access is expected to not only allow students to access course materials and content, (Yang & Yang, 2011) institutional data and other applications (Sprint, 2010) at any time of day but will allow students and staff to communicate with each other more fully outside of the traditional learning environment (Yang & Yang, 2011) It is the manner in which 4G will provide greater access to reliable, efficient and new communication and interactions systems which is considered to be one of the benefits of 4G (Serrano-Santoyo & Organista-Sandoval, 2010) and may lead to new forms of collaboration. (Yang & Yang, 2011)

It is important however that, due to the manner in which 4G technologies are expected to change society itself (Traxler, 2007) it may be difficult to know how education may develop in the future or which tools and services may be available to us. Largely it is expected that the success and usage of 4G services will depend upon the individuals who are using the mobile devices and the degree to which staff and students consider the systems offered are useful and enhance learning. (Corbeil & Valdes-Corbeil, 2007) It is therefore important that institutions encourage staff to consider the ways in which such technologies can be used in education. (Corbeil & Valdes-Corbeil, 2007)

4. Summary of the literature review

From the literature it is clear that there are a number of key ways in which 4G is expected to be beneficial to the educational sector. Firstly issues of the effectiveness of 4G must be considered such as the speed of connection and the coverage of the network. Both of those factors will affect the benefits that could be gained from the introduction of such services that include the mobility of broadband equivalent connections and the ability to gain access in a range of locations.

If these areas have been successfully achieved it may then be possible for teachers and students to start to imagine some of the possibilities this technology may be able to afford education such as any time / any place, access to education, transforming teaching and learning and other benefits.
Each of these potential affordances shall therefore be considered in relation to a trial project currently underway within the UK HE sector.

5. Methodology

This research will utilise an exploratory case study approach. A case study approach is a qualitative research approach that allows the researcher to explore a phenomenon or topic within its context (Saunders, Lewis & Thornhill, 2012). It is considered to be a useful method when an in-depth and holistic approach is required. (Tellis, 1997) An exploratory case study is a method that is used effectively when there is no clear single outcome to the research being undertaken. (Yin, 2003)

A case study allows the researcher to collect a range of detailed information using a variety of methods over a period of time. (Creswell, 2009) The manner in which a case study approach allows the collection of data using multiple methods, which may be qualitative or quantitative, also allows a triangulation of data that ensures a higher level of validity to the research. (Saunders, Lewis & Thornhill, 2012).

Whilst the validity is therefore considered to be high, generalisation is often an area that receives criticism within this approach. This is however refuted by proponents of this approach who consider that generalizability can be achieved when this approach is designed and used appropriately. (Tellis, 1997)

Further criticisms of a case study approach include that access to a suitable organisation can be difficult to gain, the process of research can be time consuming, the parameters of the research can be hard to define and that influences such as previous experience will play a part in the results but will not necessarily be understood by the researcher. (Collis & Hussey, 2003)

5.1 The case study

This case study utilised the opportunity provided by a six month 4G trial project funded by JANET. This project invited interested UK educational institutions to take part in a trial, which aimed to explore the potential use of 4G services within the UK educational sector. (JANET, 2013)

Participating institutions were given a number of MiFi devices that allow the connection of up to 10 devices to the 4G network via Wi-Fi. The aim of the trial from JANET’s perspective was to gain feedback relating to the connectivity and performance of the 4G services on offer and additionally to gain an understanding of the potential benefits and limitations of the services within the educational sector. (JANET, 2013)

5.2 Data collection

Data collection for this case study was undertaken through semi-structured interviews with pilot participants who were invited to take part from a range of institutions. These were conducted via face-to-face interviews and via computer mediated asynchronous methods. Interviews were conducted with five participants within the pilot and the results of these interviews are reported below.

In addition to the interviews, data was collected via a quantitative survey of the speed of connections gained at differing locations across the UK. Participants captured these as they utilised 3G, Wi-Fi and Mifi during the trial.

6. Findings

In order to consider the findings of the pilot in relation to the literature four key areas will be covered. The first area of consideration will be the general effectiveness of the 4G services experienced within the pilot.

6.1 General effectiveness of 4G services

Table 1 below demonstrates the speeds that have been achieved when using a range of connections across the UK.
It is clear from the results seen in this table that currently the speeds offered by broadband and Wi-Fi far exceeds those offered by either 3G or 4G. From this table it is demonstrated that the current 4G speeds in fact exceed the 10 mbps expected in terms of download speeds. These speeds are therefore significantly greater than those achieved by 3G services on offer. These figures appear to be representative of speeds gained by participants across the trial. It is also important to consider user feedback that is received as a result of using the devices.

From the results it would appear that access to 4G was mixed and in some cases staff appeared to be expecting 4G to be present in areas in which had not yet been provided:

“...I did in London, but not in Portsmouth, Bournemouth, Cornwall or parts of Plymouth.” (S1)
“4G didn’t last for long on the train and after an initial period the rest of the journey was pretty much a black spot.” (S5)

Where staff was in 4G areas they indicated that access to the 4G network was relatively good:

“Yes I can access 4G. There are a few areas it won’t work on route from Plymouth to Penzance but it’s never been an issue as I just do something else until it returns, and it does.” (S2)

“Bristol is the only place so far that I have visited that has a native 4G cell network. 4G worked very well there.” (S3)

Where staff have been able to access 4G there appear to be mixed opinions concerning its quality. For some staff it appears that 4G was fast and worked well:

“The speed of 4G from Bristol to Birmingham is amazing even on a moving train.” (S4)
“When tested with three devices whilst on 4G in Bristol city centre it provided very fast simultaneous access.” (S3)

Other staff however felt that 4G did not provide something that could not be gained from Wi-Fi connections:

“Most often the location that I ended up in would have Wi-Fi and I would find that to be as equally good as using 4G.” (S5)

It would appear that there does seem to be general agreement that having access to 4G on the train is useful:

“Overall, it means I can stay in touch and on the pulse all the time I’m on the train.” (S2)
“A good internet signal can make the train journey far more productive.” (S5)

Although it is noted by one participant that:

“If I was on a train with Wi-Fi though this probably would remove the need for 4G access.” (S5)

It would appear generally that staff felt that 4G devices were useful and did represent an improvement when compared to existing network connections but these were not considered to be an improvement in comparison to Wi-Fi:

“Once 4G becomes nationwide I can see it being useful as a general speed boost for any Internet activity one might need to partake of whilst away from Wi-Fi.” (S3)

Where Wi-Fi wasn’t available staff appeared to embrace the opportunity to use 4G when it was readily available. One staff member commented:

“I love my device and it has literally change my life. I don’t think I can, or should, go without it,” (S2)
6.2 Any where, any time access

It would appear that staff did not give a great deal of consideration to the manner in which such devices may improve access to education. As staff were asked to mainly reflect on their personal usage this is not surprising. One member of staff did comment however that they felt that such devices would be useful for extending access to education:

“I am sure especially in terms of distance learning soon to be expanded within the institution.” (S1)

Whilst therefore there was little consideration of the widening of access 4G may give, one respondent did comment that their access to online services had been improved substantially and this had resulted in students and colleagues being able to contact them more easily (S2). This respondent also comments that:

“I used to feel that it was “dead” time travelling before because we really need the Internet to do our job.” (S2)

This indicates the way in which the Internet is now becoming integral to academic work.

6.3 Changing teaching and learning

In terms of teaching and learning it would appear that staff could see the benefits of using 4G as allowing new pedagogies and teaching approaches:

“It will allow you to do anything you do indoors, outdoors. This will really change teaching and learning experience.” (S4)

“It’s also an excellent device to have in the classroom, or should I say in our outdoor classroom.” (S2)

“These specific devices could be useful for field trips where you want students to connect to the Internet through a controlled connection.” (S3)

Participants also considered the major benefits of delivering in a range of off-site locations:

“This will enable sessions to occur in a range of environments and allow students to have hand on experiences and learn from this.” (S5)

It is interesting to note that staff had discussed the use of such devices and had begun to trial them with students who were also stated as considering the devices to be useful:

“The students think it is a brilliant device for continuity and remote teaching.” (S2)

6.4 Personal and organisational efficiency

In relation to personal and organisational efficiency it appeared that staff did not feel there was a huge benefit to the use of 4G:

“Probably not a life changing experience.” (S3)

“These devices haven’t really improved my efficiency. It’s been useful but it hasn’t really change things.” (S5)

Amongst other staff however it would appear that the use of such devices had a real impact and made a significant difference to their work:

“Extremely useful and something I should like to use permanently.” (S1)

“I love my device and it has literally changed my life. My time is now used efficiently and effectively. My productivity has been increased.” (S2)

7. Discussion

From the findings it would appear that 4G is proving beneficial to individuals as predicted in the literature. (Warman, 2013) There does however appear to be a lack of understanding and some frustrations amongst respondents that 4G is not yet universal. (Gradwell, 2012) It also appears that staff did not see any major advantages in using 4G over Wi-Fi or that there were any benefits in doing so if Wi-Fi was available. (Place & Keeping, 2012)
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In relation to improved access to education it does appear that some respondents did note that the provision of 4G may aid in distance learning opportunities and this may suggest staff saw the opportunities 4G may give to reach a greater range of learners. (Geer, 2012; Traxler, 2007)

Staff who lived further away from the institution did consider 4G to be beneficial in allowing independent working whilst travelling (Traxler, 2007) and did state that this allowed other staff and students to respond with them more easily. (Serrano-Santoyo & Organista-Sandoval, 2010; Yang & Yang, 2011) It would therefore appear that 4G did allow staff and students to be more flexible in their learning.

One of the major benefits staff appeared to identify was the ability of teaching and learning to occur at a range of new locations and particularly in non-traditional locations (Serrano-Santoyo & Organista-Sandoval, 2010) such as outside. This indicates that the provision of 4G within teaching and learning may allow the establishment of new forms of pedagogy and new teaching practices.

In relation to personal efficiency and effectiveness it would appear that as yet 4G technologies have not changed society. A number of staff appear not to consider 4G to have significantly change their working practices however this may be due to the current lack of availability of the 4G network across much of the country. These views may change as 4G is rolled out more fully. For those staff that appear to have access the use of 4G does appear to be advantageous and something which staff would wish to continue to use in the future. It also appears that the use of 4G may lead to the development of new forms of teaching and learning practice but until 4G is more universally distributed across the UK this is likely to only occur on a small scale.

8. Conclusions and recommendations

This research has considered the affordances of 4G within the UK education sector. From the literature reviewed and the study undertaken it is clear that 4G within the UK is still evolving and coverage is currently limited. With this in mind however it would appear that the promises of such technologies are considered to be fairly high and there are expectations of changes to society as well as to education. In reality it would appear that 4G is something which staff found beneficial, particularly staff who face a daily commute. Benefits relating to teaching and learning are being considered by staff but as yet these have not been fully considered.

As 4G is rolled out across the UK and network speeds are increased it is likely that the benefits identified above will become more pronounced and therefore a greater degree of interest will be shown in developing new forms of teaching and learning and approaches to education.

Future research may consider whether the expectation and use of 4G changes as it becomes a more mature and commonplace service and whether this has a fundamental impact on the manner in which teaching and learning is conducted in addition to the manner in which staff work and students learn.

References


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AN EVALUATION OF THE IMPACT OF ACADEMIC STAFF DIGITAL LITERACY ON THE USE OF TECHNOLOGY: A CASE STUDY OF UK HIGHER EDUCATION

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Abstract

The proliferation of new forms of technology and specifically Web 2.0 and Internet technologies has undoubtedly affected every aspect of our lives and none more so than in education. Increasingly Web 2.0 tools and eLearning is promoted within schools, colleges and universities with concepts such as cloud computing, bring your own device (BYOD) and bring your own technology (BYOT) being considered viable options for enabling students and educators to integrate technology into their education.

As a result of these developments educators are being asked to pay greater attention to the digital literacy of students and to ensure that students are prepared and able to use technology competently. However whilst much focus is placed on the student use of technology less attention has been paid to the digital literacy of academic staff.

Academic staff will often be integral in selecting the manner in which information is presented to students as well as the manner in which students are required to complete and submit work. Therefore whilst students may wish to utilise web technologies for their education it is unlikely that if academic staff do not understand or engage with such tools that students will be given the opportunity to fully engage with these technologies within their studies.

It is within this context that this paper considers the degree to which the digital literacy of academic staff may be an issue within UK Higher Education (HE). This is undertaken through the analysis and discussion of primary research undertaken amongst the staff within a UK based HE institution.

This paper considers the degree to which academic staff have engaged with web based technologies and general IT within their daily lives and within teaching practice. This research suggests that staff are familiar with web based technologies and are engaging with such tools within their daily lives but do not have the confidence to utilise these within their teaching practices particularly as students are expected to already be very familiar with such technologies.

This paper provides a research model in which the factors that may influence the degree to which academic staff feel confident in utilising web based technologies within both their personal lives and for teaching and learning can be tested.

Keywords: Digital literacy, Web 2.0, Case Study, Higher Education, IT, Internet Technologies, Academic Staff, Teaching and Learning.

1 INTRODUCTION

The rise of web 2.0 tools and digital technologies in recent years has undoubtedly resulted in an increase in the promotion of such tools within education. It is argued that students entering University today are increasingly wishing to use such tools within all aspects of their lives however it is not yet clear whether academic staff are ready to engage with such tools particularly as they are likely to be from older generations who are considered to be less engaged with these tools.

As the proliferation of Web 2.0 tools continues it is therefore increasingly important for educators and academic managers to better understand the reasons why academic staff may be reluctant or uncomfortable with using such tools in teaching. In order to explore this further a research model is proposed within this paper which seeks to identify the factors which may indicate the reasons why academic staff may choose to engage with such tools. Before the model is presented however it will be first necessary to consider the current teaching and learning landscape that will provide a greater
understanding of firstly the manner in which Web 2.0 and digital technologies are developing and the affect this will have on both students and staff. Secondly the affect such tools may be having on education and finally the manner in which the digital literacy of academic staff may be determined and improved.

2 THE RISE AND USE OF DIGITAL TECHNOLOGIES

It is increasingly argued that there is a new generation of students entering Higher Education (HE) who are very different from previous generations. This generation is considered to have grown up using computers, Internet technologies and increasingly Web 2.0 technologies and are assumed therefore to have a natural ability and affinity when using technology [1]. By comparison, their teachers who have encountered such technologies later in their lives are generally thought to find technology more difficult to adapt to and to have less literacy and affinity than those who are younger than them [1].

However it is argued that defining all academic staff in this way is unfair and is not representative of the manner in which academic staff may actively choose to use technology within their teaching [1]. In fact it is argued that teachers, students and other users of technology are more likely to behave according to factors such as age, educational level, previous experience, individual preferences, etc. [2]. In reality it can be argued that how students and staff use technology is dependent on experience and degree to which they have previously used technology, resulting in a broad spectrum of usage, skill level and knowledge. For example an individual is far more likely to learn solely what is required for a task or activity than for in-depth usage [3]. However this could also lead to a lack of adequate knowledge and skills to enable efficient and effective use of technology [4].

Whilst the use of technology can be determined by previous usage it is likely that age is a predictor of previous use. Students entering university today are far more likely to have had experience and exposure of new technologies throughout their educational life than previous generations due to the fact that these technologies have only been in existence in the last few decades [5]. These students are therefore also far more likely than previous generations to expect technology to be used throughout their lives and this will include an expectation that academic staff will make use of technology within their teaching [6]. It is also more likely that students will become frustrated if such technology is used in an inappropriate manner by academic staff [3], [7]. This could possibly lead to a potential mismatch of student expectations and staff competency where technology is not used appropriately or competently [8].

Whilst it may be considered that students wish to utilise technologies within their education it is important to note that there may also be differences in the digital technologies both staff and students may consider to be “living technologies” as opposed to “learning technologies” [1].

Whilst students may use “living technologies” and have had positive experiences of “learning technologies” within the classroom [3], they may not necessarily be competent or knowledgeable enough to use appropriate technologies within the learning environment. This may require academic staff to introduce and instruct students in the use of such technologies. An additional concern may be that students may not be utilising digital technologies in a sufficiently critical and reflective manner and it is this which academic staff will be required to develop in students [9].

This provides an indication that it is increasingly necessary for institutions to ensure that their academic staff are not only developing expertise in technology but also that they understand how students perceive technology [4] and their expectations of usage within teaching and learning. Academic staff for example may need to reconsider the use of traditional assessment tools such as essays in favour of more technology rich and student friendly tools such as multi-modal presentations [7]. This shift may require a change in understanding for academic staff, particularly those who may have been teaching for a long period of time and may consider their teaching to be optimal. Long standing academic staff may consider the characteristics of today’s students such as the expectation of ubiquitous connectivity, minimal tolerance for delays, the ability to multitask, etc. to be negative characteristics and not a helpful advancement of student characteristics [4].

It is worth noting that institutions allowing students to lead staff in the use and adoption of technology are likely to be at a competitive disadvantage making them less attractive than when compared to those in which staff are seeking to be technologically innovative [10].
It is therefore vital that the use of technology within teaching and learning is considered to be both a strategic priority and a key investment area for academic staff development for both existing and future staff [4].

The manner in which digital technologies are adopted by academic staff in an educational context shall now be considered in more detail.

3 THE USE OF DIGITAL TECHNOLOGIES IN EDUCATION

It is argued that many academic staff are not familiar with either the operational or cultural aspects of digital technology and the associated literacies and practices [11]. In reality whilst the majority of academic staff may have adopted digital technologies to support existing work practices and teaching activities, other more innovative modes of technology to support students have not been adopted [9].

Currently the use of digital technologies within education by academic staff is considered by students to demonstrate at best, mixed usage and at worse poor or even inappropriate usage [4]. Primarily the reasons for this are considered to be either staff reluctance [12] or lack of confidence [8] to undertake new practices.

Confidence in reality appears to be an issue in the use of digital technologies amongst academic staff who appear to be particularly concerned that technology may fail and that support may not be available to them if this occurs when they are in front of a class [11]. A further concern for staff appears to be the degree and speed with which technology is changing which will often result in changes to technology before staff are able and ready to use them [13]. This issue is only further enhanced when, as previously discussed, distinctions are made between “living” and “learning” technologies [1]. The distinction between “living” and “learning” technologies result in staff not perceiving their personal use of technologies to be useful to their development within a teaching and learning context [1].

Confidence may be improved through appropriate staff development (Spratt et al), particularly training that enables academic staff to become familiar with a technology, observe others who are experienced using such technologies successfully and use the technologies themselves [11]. However one potential area of concern is the perceived potential threat that the use of technology would have on the current high degree of professional discretion and choice of pedagogy individual academic staff have [8], [14].

In addition to issues of confidence, the use of technology by academic staff is likely to be affected by issues such as experience, usefulness, usability and accessibility of hardware [11]. Additionally it is important to note that the use of technology may also be affected by the discipline in which the academic member of staff is teaching [13], [15].

The various reasons for the differences in usage will be looked into within the context of digital literacy of staff and the manner in which this is enhanced within an institution.

4 DIGITAL LITERACY

The manner and frequency with which digital technologies and tools are introduced appears to suggest that there is an assumption amongst developers that new tools will be automatically integrated into and create new forms of education as soon as they are introduced, but this is not the case [15]. In reality the acquisition of new digital skills does not necessarily occur automatically or easily and is dependent upon a range of institution, personal and wider social factors [2].

In relation to academic staff the manner in which new digital literacy skills are acquired is increasingly important as not only will academic staff be expected to be digital literate they will also be expected to ensure that this is the case with their students [2], [8]. Within this context this will result in the need for staff to not only use and be familiar with tools such as the Virtual Learning Environment (VLE) but also wider digital tools, which it is reported only 10% of academic staff currently use [9].

Digital literacy is considered to be one of the most important skills an individual can have today [11] and a requirement for survival within the digital age [16]. Digital literacy is defined as:

“... the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new
knowledge, create media expressions and communicate with others, in the context of specific life situations, in order to enable constructive social action; and reflect upon this process [17]."

Academic staff are increasingly faced with pressures from a range of sources to engage with digital technologies and to share "digital wisdom" with their students [9]. Academic staff are therefore expected to be able to train students to be able to use digital technology tools in both their current studies and future work [11]. This is made more complex however by the manner in which digital tools and technologies can be considered to be in a persistent state of flux [11] which can result in some staff considering that digital technologies are passing fads [4]. It is important for academic staff to be made aware that digital technologies are not going to disappear quickly [18].

Although digital technologies can be learnt through both informal and formal means, it would appear that digital technologies expertise will be most likely to be learnt and mastered informally [11]. Largely the manner in which individuals are expected to best learn will depend upon the confidence in using digital technologies with those with lower confidence requiring greater support from formal training [9]. However whilst training may assist in the development of digital literacy it is important to note that there can often be a mismatch between the training provided and the needs of academic staff who are often not involved in the design of such training [2].

In order to investigate the digital literacy of academic staff in more detail a research model has been created as a result of the areas covered in this literature review and will now be considered further.

5 RESEARCH MODEL

The research model shown in Fig. 1 has been created following the completion of the literature review and aims to demonstrate the key factors that may influence the extent to which academic staff can be considered to be digital literate and likely to use digital technologies within their teaching.

The model demonstrates the manner in which demographic information and experience may affect the digital literacy of academic staff [2] and also the way in which confidence [8] in the use of digital technologies, in terms of both “living” and “learning” technologies [1] may affect the way in which academic staff choose to engage with digital technologies. Within this research paper the model will be reviewed in terms of the key factors identified and the extent to which age, gender, access to computers and access to Internet enabled mobile devices affect the digital literacy of academic staff.
6 METHODOLOGY

This research utilised a quantitative survey method in order to collect results from the full population of
the case study institution. This method is popular as it allows the investigator to collect standardised
data from a population in an effective manner and allows easy comparison of the results gained [19].

Advantages of this method include that it is a practical means of collecting data, large degrees of
information can be obtained in a relatively short period of time, reliability and validity are relatively
high, analysis can be undertaken quickly and easily and it is argued that results can be used to
compare and contrast to other research as well as being a useful tool to test and create new theories
[20]. Additionally surveys are considered to be advantageous as they allow the collection of empirical
data, it is generally generalizable to a population and can be cost effective to undertake [21].

Disadvantages of this method include that it may be considered to lack sufficient depth as results can
be superficial, the manner in which answers are predetermined may not appropriately demonstrate the
feelings of respondents and that this method collects a snapshot of feelings at that point in time [22].
Further disadvantages of this method are considered to be that the significance of the data collected
may become neglected if the researcher tries to cover too many areas at one time and loses focus on
the issue under consideration and additionally that high response rates can be difficult to achieve [21].

A 61% return rate was seen which is considered to be slightly higher than the average return rate
found in academic studies [23].

Due to the advantages stated above this method was considered to be the most appropriate strategy
to use in this case.

7 CASE STUDY INSTITUTION

Plymouth College of Art is an independent specialist College of Art and Design based within the South
West of England. The College currently has approximately 1,500 student enrolments across a range
of art and design courses. The College has approximately 200 staff of which 100 are academic staff.
Academic staff generally will teach within one course area and subjects range from those with limited
digital skills required such as contemporary crafts and fashion to those with a high level of digital skills
required such as animation and design for games.

This survey was distributed to all academic staff initially via an email, which contained a link to the
survey in an online form.

From the responses gained it is reported that 32 of participants are male, 25 are female and 4
preferred not to answer the question. Respondents were also asked to indicate which technological
era they were born within. 22 individuals indicated they were from the Baby Boomers (1946-1964), 32
individuals stated they were from Generation X (1965-1981), 2 respondents stated they were from the
Net Generation (1982-1990) and 1 individual stated they were from the IGeneration (1991+). Once
again 4 individuals preferred not to indicate the generation they belonged to.

8 RESULTS

8.1 Access to Computers and Mobile Devices

8.1.1 Computer access

From the questionnaire it is apparent that 100% of respondents have access to a computer with 48%
of respondents indicating that they have had access to a computer for 10 years or more. A further
26% have had access 6 to 10 years and 18% 4 to 5 years. It would appear that there is little difference
between male and female respondents, with 75% of female respondents having had access for 6
years or more and 70% of male respondents having access for 6 years or more. In relation to age it
would appear that there are generally similar lengths of time of access to computers with
approximately 70% of each age group indicating they have had access for 6 or more years.

8.1.2 Internet enabled mobile device (IEMD) access

Results showed that more respondents had access to a computer than had access to IEMD; with 49%
of respondents indicating that they had access to an IEMD, 37% of those with internet enabled device
have had access for between 2 and 3 years, which represents the majority of respondents. It would appear that there is little difference in the likelihood of male or female respondents having access to a mobile device although male respondents are more likely to have had access to such a device for longer with 46% of male respondents reporting to have had access for more than 4 years and only 26% of female respondents meeting the same criteria. Amongst the older generations there are lower overall levels of ownership however devices appear to have been held for a longer length of time with the majority of respondents indicating ownership for more than 6 years.

8.2 Frequency of Usage of digital technologies

8.2.1 Frequency of usage in general life

When asked to indicate the extent to which respondents used computers, the internet and digital technologies within their daily lives all respondents indicated that they used technologies at least once a week with the majority indicating they use technology multiple times a day (85%). Whilst there is therefore a large majority of individuals who access technology multiple times a day when considered in relation to gender there does appear to be some variation as male respondents are more likely to access technology multiple times a day.

It would appear that older respondents are less likely to access technology multiple times a day. 82% of baby boomers access technology multiple times a day compared to 91% of Generation X and 100% of the Net Generation. Respondents who have had access to a computer for the lowest length of time are less likely to use technology multiple times or at least once a day.

It would appear however that access to an IEMD does result in greater usage of digital technologies. 93% of respondents who have access to an IEMD indicated that they used digital technologies multiple times a day whereas this reduces to 77% for those who indicated they had no access.

8.2.2 Frequency of usage in teaching

When respondents are asked to consider the extent to which they use technology in their teaching the percentage that indicate multiple times a day decreases significantly when compared to general life.

When considering usage for teaching there does appear to be some difference in usage by gender. It would appear that female respondents are more likely to use digital technology within their teaching multiple times or at least once a day with 85% of respondents indicating this. By comparison 76% of male respondents indicated that they use technology multiple times or at least once a day.

It would appear that the older the respondent the more likely they are to use digital technology within their teaching. 86% of baby boomers indicated that they would use digital technologies multiple times or at least once a day, followed by 82% of Generation X. The Net Generation only was comprised of two respondents who both indicated that they used digital technologies multiple times a day but only 40% of respondents who classified themselves as IGeneration indicated that they used digital technology in their teaching multiple times or at least once a day.

When considering the length of time respondents have had access to computers it is clear that those respondents that have access to computers and technology for longer are more likely to use technology multiple times a day. There appears to be a considerable difference between those respondents who have had access to computers for 6 or more years of whom over 50% utilise digital technologies multiple times a day and those who have had access for less than 5 years of whom under 30% indicate they use digital technologies multiple times a day.

In relation to mobile access there is much greater usage of digital technologies within teaching multiple times a day amongst those who have mobile access than those who do not have mobile access.

8.2.3 Expectations of student educational frequency of usage

When staff were asked to consider the degree to which students use technology as part of the learning process 50.8% of respondents indicated that they believed students used such technologies multiple times a day whilst 32.8% indicated at least once a day. The remaining respondents either considered that students used digital technologies as part of their learning either at least once a week (14.8%) or at least once a month (1.6%).
In terms of gender it would appear that male respondents consider that students use technology as part of their learning experience to a high extent with 62% of respondents indicating multiple times a day and a further 28% indicating at least once a day. Female respondents consider that students use such technology to a lesser extent with 40% considering students use digital technologies multiple times a day and 38% at least once a day.

There would appear to be relatively little difference in the views of respondents depending upon their age or on the length of time they have had access to a computer. It would however appear that those staff that have access to an IEMD consider that students do use technology for learning to a greater extent than those with no access to an Internet enabled device.

8.3 Familiarity with technology

A total of 26 computer, Internet and web 2.0 terms were provided to respondents who were asked to indicate the degree to which they were familiar with the term. Respondents had the option of choosing from none, a little, to some extent, good, full and use within my teaching.

Table 1 provides details of the terms that respondents indicated they used within teaching the most. From the responses seen it would appear that academic staff are most likely to use older tools within their teaching that are generally not web based tools but file types generally associated with Web 1.0 than Web 2.0. Where Web 2.0 tools are used these largely relate to areas which have been promoted by the institution such as the VLE, blogs and video sharing.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Email</th>
<th>PDF</th>
<th>JPEG</th>
<th>VLE</th>
<th>Digital Video Sharing</th>
<th>Blogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Use within Teaching</td>
<td>75.9%</td>
<td>74.1%</td>
<td>72.9%</td>
<td>64.4%</td>
<td>50.0%</td>
<td>48.3%</td>
</tr>
</tbody>
</table>

Table 2 provides details of the terms that respondents indicated they were least familiar with. These terms are generally web-based tools that will have not been introduced to staff via the institution and are generally newer tools which staff may not be familiar with within their general lives.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Audience Response System</th>
<th>Widgets</th>
<th>RSS feeds</th>
<th>Social Bookmarking</th>
<th>Web based presentation tools</th>
<th>Virtual Discussion Groups</th>
<th>Twitter</th>
<th>Digital Story Telling</th>
</tr>
</thead>
<tbody>
<tr>
<td>% No awareness</td>
<td>73.7%</td>
<td>54.4%</td>
<td>52.6%</td>
<td>51.8%</td>
<td>44.6%</td>
<td>39.7%</td>
<td>39.7%</td>
<td>39.7%</td>
</tr>
</tbody>
</table>

Table 3 provides details of the terms that respondents indicated they were most familiar with but which they do not use in teaching. It is interesting to note that within this category it is social networking which staff are most familiar with but they do not use this tool within their teaching. Similarly digital mapping and web based storage systems are both Web 2.0 tools, which staff again are familiar with but are not using within their teaching. It is interesting to note however that HTML may be present for a differing reason. HTML is an older technology that it is no longer necessarily relevant to Web 2.0.

<table>
<thead>
<tr>
<th>Tool</th>
<th>Social Tool Networking</th>
<th>Digital Mapping</th>
<th>HTML</th>
<th>Web Based Storage systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Full familiarity</td>
<td>39.7%</td>
<td>26.8%</td>
<td>26.8%</td>
<td>24.6%</td>
</tr>
</tbody>
</table>

8.4 Confidence when using technology

Confidence was considered in relation to three areas, confidence when learning a new technology, confidence in using technology in teaching and confidence in using technology as an individual choice.
as shown in table 4 below. Overall it would appear that respondents are far more confident in using digital technologies within their own lives. Respondents appeared to be less confident in using digital technologies within a teaching session although they appeared to be the least comfortable with learning new technologies quickly.

In relation to gender it would appear male respondents were more confident in using technologies in all areas but particularly in using technology for lifelong learning and for keeping in touch with others.

When considering results by age it does appear that Generation X are more confident across all questions than Baby Boomers. Whilst only minor differences are seen in relation to confidence in dealing with issues of copyright and IP and justifying when to use digital technology in class all other questions demonstrated notable differences between these groups.

IEMD usage appears to also have a positive effect on confidence across all questions with those indicating they have access to a mobile device responding more positively.

Table 4 – Responses to questions relating to confidence levels.

<table>
<thead>
<tr>
<th>Confidence Category</th>
<th>Question / Area</th>
<th>Very Confident</th>
<th>Quite Confident</th>
<th>Fairly Confident</th>
<th>Somewhat Confident</th>
<th>Slightly Confident</th>
<th>Not at all Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning New Tech.</td>
<td>Learning a new technology in a session</td>
<td>24.6%</td>
<td>33.3%</td>
<td>22.8%</td>
<td>10.5%</td>
<td>1.8%</td>
<td>7.0%</td>
</tr>
<tr>
<td>In Teaching</td>
<td>Use digital technology in class</td>
<td>31.6%</td>
<td>31.6%</td>
<td>19.3%</td>
<td>14.0%</td>
<td>1.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>In Teaching</td>
<td>Judge when to use digital technology to support student learning</td>
<td>36.8%</td>
<td>38.6%</td>
<td>15.8%</td>
<td>7.0%</td>
<td>1.8%</td>
<td>0%</td>
</tr>
<tr>
<td>In Teaching</td>
<td>Justify the use of digital technology in relation to copyright and IP</td>
<td>19.3%</td>
<td>24.6%</td>
<td>17.5%</td>
<td>17.5%</td>
<td>15.8%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Individual Choice</td>
<td>Using digital technology to keep in touch with others</td>
<td>52.6%</td>
<td>29.8%</td>
<td>7.0%</td>
<td>8.8%</td>
<td>1.8%</td>
<td>0%</td>
</tr>
<tr>
<td>Individual Choice</td>
<td>Use digital technologies for lifelong learning</td>
<td>64.9%</td>
<td>14.0%</td>
<td>12.3%</td>
<td>3.5%</td>
<td>5.3%</td>
<td>0%</td>
</tr>
</tbody>
</table>

9 DISCUSSION

From the results seen within this research it is clear that digital technologies are becoming increasingly important within the daily lives of academic staff. It would appear however that there is a difference in the extent to which academic staff use digital technologies as “living technologies” as opposed to “learning technologies.” [1] This is demonstrated in both the frequency with which staff indicate they use digital technologies for general life and teaching and also in the familiarity they indicate they have with various Web 2.0 and Internet technologies. It is perhaps unexpected however that academic staff consider that students use digital technologies less in their learning than academic staff do in their general lives. This is unexpected as it is suggested that students are now part of a new generation of students who are considered to a natural affinity and ability in using such technologies. [1] It should be noted however that academic staff did consider that students used technology more within their learning than academic staff do within their teaching possibly indicating that academic staff are aware that students are using technology independently.
The issues of confidence indicated in the research model do appear to be important when considering the manner in which technology is likely to be adopted. Staff appeared to be most confident in using technology within their general lives and less confident in utilising digital technologies within their teaching or to learn a new tool quickly. The fact that confidence is higher when academic staff are utilising these tools alone may reinforce the suggestion that academic staff are concerned about technology failing when in front of students [11]. Furthermore, the higher confidence levels of academic staff when utilising tools for individual use may also indicate that academic staff are more comfortable in using technologies when they work alone, choose their own tools and work at their own pace.

From the results seen, it would appear that factors such as age, gender, access to an IEMD, and access to a computer do have an effect on the degree of confidence and frequency of use of digital technologies. The manner in which these factors affect the use of digital technologies appears to vary depending on the area under consideration. It does not appear, as indicated in the literature, that factors such as age can be directly linked to the usage of digital technologies. It would appear however that there is a correlation between gender and confidence in using technologies with male respondents appearing to be more confident in the use of technology. It would also appear that those individuals who have access to an IEMD are also more likely to be more confident in the use of digital technologies and generally use these tools to a greater extent than those who do not have access.

It is also important to note from the results that respondents appear to be familiar with a range of digital tools and technologies and there are only a small number of tools, which are generally older, that a large number of individuals use. This would appear to reflect the range and number of digital tools that are being introduced at an increasing rate [2]. Additionally, the manner in which academic staff appear to use a range of digital tools may reflect the way in which individuals learn to use new digital tools in an informal manner rather than through formal staff development [11].

Overall from the results seen, it would appear that academic staff are using digital technologies within their daily lives and do expect students to be using digital technologies within their learning. It is clear therefore that the majority of academic staff do have some degree of digital literacy. The extent to which these “living technologies” can be adopted as “learning technologies” and the degree to which academic staff would be willing to adopt these tools within their teaching is yet unclear.

10 CONCLUSIONS & RECOMMENDATIONS

This research paper has considered the manner in which academic staff have adopted digital technologies within both their general lives and within their teaching. From this research, it is clear that the use of digital technologies by academic staff is a complex area of study in which the digital literacy of academic staff must be attributed to a number of interrelated factors including age, gender, etc.

The research model and initial testing would appear to suggest that confidence is a key factor when considering the digital literacy of academic staff and that this can be differentiated in terms of confidence in teaching, confidence in communicating with others and confidence in learning new tools.

In future research, it is proposed that the research model will be tested further in order to consider the relationships that may exist between factors in addition to the areas considered here. Additionally, future research should capture the views of students who may present differing perspectives on the use of digital technologies within education and also provide an indication of their own views.

REFERENCES


The Changing Roles of Staff and Student Within a Connectivist Educational Blog Model

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Abstract: Whilst the use of web 2.0 tools and specifically blogs is becoming increasingly popular within Higher Education (HE) and has been shown to promote learning (Garcia, Brown & Elbeltagi, 2012) relatively little is known about the manner in which such tools may affect the roles of both staff and students within teaching and learning. It is within this context that connectivism, a learning theory for the digital age, provides a model through which the roles of staff and students when using collective student blogs for teaching and learning can be considered. Within this research a case study of a collective student blog project, undertaken by students based within an HE institution, is utilised to explore the changing nature of the roles of both staff and students through a connectivist-learning model of blog usage. From this case study it would appear that connectivism does provide a sound theoretical model for the way in which staff and student roles may change as a result of the use of blogs within teaching and learning. However the experience of staff and students who undertook the project suggests that whilst a number of elements of the connectivist model can be identified, these are not seen universally amongst all students. Where a connectivist model of learning through blogs can be seen to be effective, staff were considered to be able to be more constructively critical in their feedback whilst being less directly involved in formative feedback to the student, which was welcomed by staff. Students meanwhile also considered benefits to exist and these largely related to the manner in which students were able to provide and receive peer review and feedback in a more critical and constructive way than they had before, seeing the benefits this could provide. These benefits were however dependent upon other group members also responding in a timely and constructive manner.

Keywords: blogs, connectivism, higher education, changing academic staff roles, changing student roles

1. Introduction

The use of Web 2.0 within Higher Education (HE) has become increasingly popular in recent years and consequently much has been written concerning the manner in which such tools can be used to enhance teaching and learning. What has been less clearly articulated however is the manner in which such tools can fundamentally change student and staff roles, not only as a result of the use of technology but also the effect that the use of such tools has on how learning occurs. This has led, particularly through the use of blogs, to the development of new forms of teaching, learning, pedagogy and learning theories.

One of the most relevant theories, to come to prominence due to the rise of Web 2.0 is Connectivism. Connectivism is not an area in which a great deal of research has been conducted particularly in relation to the use of blogs within teaching and learning and the effect the use of blogs may have on both staff and student roles. The roles of both staff and students are particularly important within a connectivist-learning model and this is therefore an area that requires further investigation.

Before considering the extent to which blogs reflect a connectivist-learning model and the manner in which this affects staff and student roles, in terms of both teaching and learning, it will be first necessary to consider the nature of connectivism as a teaching and learning theory before considering the manner in which this will be reflected in the use of blogs for teaching and learning.

2. Connectivism

The learning theory of connectivism was developed as a result of a belief that there was a need for a learning theory, which took into account the manner in which society has changed as a result of the new technologies of the digital age. (Siemens, 2004)

Connectivism is driven by the influence of social constructivism, network theory and chaos theory (Couros, 2009) and highlights the importance of learners making connections, which allow the flow of information to occur between the learner and their learning community. (Kop & Hill, 2008)
Within a connectivist-learning environment, learners use technology to create networks for themselves, which are open and filled with information sources that the individual chooses. This makes the network highly personalised and the responsibility of the individual. (Guder, 2010) As a result individuals are required when building their network to consider what information is of importance and what information is not. The ability of learners to additionally be able to judge when a network may no longer be useful are also vital elements of connectivism. (Siemens, 2004) Siemens (2004) defines the key principles of connectivism as follows:

- Learning and knowledge can rest in diversity of opinion
- Learning is a process of connecting specialised nodes or information sources
- Learning can reside in non-human appliances
- Capacity to know is more critical than what is currently known
- Nurturing and maintaining connections is needed to facilitate continual learning
- Ability to see connections between thoughts, ideas and concepts is a core skills
- Currency is the intent of all learning activities
- Decision making is itself a learning process

It is clear within connectivist learning that the individual and their network is of key importance. In addition the nature of the network appears to support a fundamental change in the role of academic staff as when they are present within a learner network (although this cannot be assumed) their role will be of a peer. (Friesen & Lowe, 2011)

Within this approach learning is seen to occur when peers collaboratively share opinions, viewpoints and critiques through conversation and dialogue on a more mutual basis than the traditional teacher / student relationship. (Friesen & Lowe, 2011)

In addition it is important to note that within a connectivist-learning model does not only take place within the classroom but also outside of it, often made possible due to mobile digital technologies (Guder, 2010) and the connections formed with others who may wish to continue to learn outside of the classroom.

The nature of the networks formed also places the emphasis for making and choosing connections on the student rather than the teacher. (Guder, 2010) This therefore places a greater emphasis on the student’s role within the learning process and where it exists the teachers role will be determined by the learner rather than the teacher. (Guder, 2010)

This theory is however not without its critics. Verhagen (2006) has been critical of connectivism, as he does not consider it to be a learning theory as it is based at a curriculum level rather than an institutional level. Verhagen (2006) therefore believes connectivism should be considered a pedagogy rather than a learning theory. This criticism is further support by Kerr (2007) who considers that something interesting is happening but that this is not necessarily at the level of a learning theory. Furthermore Kerr (2007) also considers that issues arise from connectivism when consideration is taken of “non-universals” which are things, which are not learnt spontaneously such as reading and writing. Despite these criticisms the concept of connectivism continues to be considered of relevance when considering learning within the digital age.

3. Connectivism and blogs

The use of blogs would appear to support connectivist learning due to the manner in which blogs are considered to provide opportunities for individuals to collaborate and communicate online with others. (Richardson, 2010) Furthermore blogs enable the creation of social structures (Efimova & Hendrick, 2005) particularly where collective blogs are used as a learning tool.

Collective blogs provide many of the features considered to be of importance in a connectivist-learning model such as allowing interaction, (Ferdig & Trammell, 2004) peer and social communities to be promoted to support learning, (Glogoff, 2005) and a continuity of conversation. (Macduff, 2009) Whilst the use of blogs can be therefore seen to meet the needs of a connectivist-learning model it is important to consider the effect this will have on staff and student roles.
Initially it must be noted that in order for blogs and a connectivist approach to be adopted staff must firstly be willing and able to use such tools. (Kvavik, 2005) As it is usually the decision of staff to use the specific technologies within a session there will be a need for staff to have knowledge of such technologies. However whilst academic staff may need knowledge of the technology the manner in which control of both the digital and learning environment moves from staff to students is an important distinction to make within both student blogs and connectivist learning. This therefore changes the role of both staff and student, particularly within group student blogs where students become accountable to each other rather than the teacher. This therefore places the role of the teacher as one concerned with ensuring that students are actively engaged and responding in a timely and relevant way to each other’s posts rather than replying themselves. (Livingston, 2011) This will however be difficult to achieve if blogs are busy or large numbers of students are involved.

The connectivist model and nature of blogs also supports any time, any place learning which may suit students but may not be appropriate for staff who may be unable to be available on a flexible basis. (Lujan-Mora & Juana-Espinosa, 2007)

One further aspect of blogging that would well support the connectivist-learning model is the manner in which external “experts” could become involved within the blog more easily than in an offline environment. The nature of blogs and the ability to reach audiences across the Internet also allows students to focus on specific communities that may be most relevant to them. The manner in which students, staff and experts may interact within the connectivist-learning blogging model is shown in figure 1.

Figure 1 demonstrates the relationships that exist between students within the blogging environment and the manner in which staff and experts may input into the community but are not automatically involved within the learning environment.

![Figure 1: Connectivist educational blog model](image-url)
In order to determine the extent to which this model represents a realistic interpretation of the use of blogging within teaching and learning, the case study of Plymouth College of Art (PCA) shall now be considered.

4. Methodology

The research is undertaken using a qualitative approach. This approach is considered to be most useful in this case as it allows the collection of research data within a natural setting and seeks to gain an understanding of participants and the relationships that exist between participants. (Saunders, Lewis & Thornhill, 2012)

According to Creswell and Clark (2011) the advantages of such an approach include:

- It aims to describe and interpret participant’s personal experiences of a phenomena
- It allows participants to share their view
- It provides a way of understanding complex phenomena
- It tries to understand the interactions between people

This therefore helps to ensure that the validity of the results is relatively high. (Creswell, 2009)

4.1 Case study method

A case study is a qualitative research method, which allows the researcher to explore phenomena within context. (Saunders, Lewis & Thornhill, 2012) Case studies are a useful method where a researcher wishes to gain a detailed understanding of the context in which the phenomena is occurring. (Saunders, Lewis & Thornhill, 2012) One of the key advantages of a case study is the manner in which it can deal with a variety of evidence (Saunders, Lewis & Thornhill, 2012). By using a variety of evidence a more detailed view of the phenomena can be considered. (Yin, 2009)

4.2 Data analysis

A total of 33 students and the academic staff team (2 staff) were asked to complete a survey, which utilised open-ended questions. In addition the staff team wrote both personal and team reflection throughout the project and were interviewed following the project. Student surveys were returned from members of five of the six teams (IJ, TF, FFF, TI and WWSY). In addition results from both staff interviews (ST1) and staff surveys (ST2) were received.

The results of both the interviews and qualitative written responses were analysed using narrative analysis. This method was chosen as it allows an account of the experience individuals have to be told in a sequential manner, which allows the opportunity to explore the events, which may be related to each other and which may provide an indication of areas of importance for researchers. (Saunders, Lewis & Thornhill, 2012)

5. Case study

The BA (Hons) Illustration course is a three-year degree programme, which runs at PCA. The use of collective student blogs occurs within a module called “Illustrative Practices” within the second year of the course. Within this module, a simulated work based learning project called “The Great Editorial Race” runs for three weeks. This project requires students to work in groups to create a number of illustrations in a relatively short timespan. The course team assigns teams and each team is responsible for setting up a group blog. A total of six teams were created and each was assigned by staff in order to be evenly distributed in terms of characteristics and performance.

The aim of the blog was to create a flexible, asynchronous online space in which students could post ideas, research and sketches, which could be commented on by others in the team before submission. This space would not be an area in which academic staff would actively participate as it was hoped that the blog would enable students to create an online community that would provide peer support and build on offline activities undertaken in the studio.
6. Findings

6.1 Student views of the changing nature of academic / student roles

From the qualitative surveys conducted it would appear that through the use of collective blogs students did appear to make connections with others as would be expected within a connectivist-learning model:

“They were very valuable... They were all positive and friendly and made you feel part of a team and not working all alone” (IJ1)

Furthermore it appears that students found the connections made within the blog provided a supportive environment in which critique, comment and constructive feedback was given therefore allowing learning to occur:

“It was really helpful in deciding what improvements to make.” (TF1)

“It is reassuring. Letting me know I’m going in the right direction and am valued by the group.” (FFF1)

This appeared to be considered by students to be driven by the student rather than by academic staff and where feedback was given it appears that this was often considered to be constructive and useful:

“We were all honest and appreciated useful feedback as to why certain things were not working.” (WWSY1)

However whilst this reportedly occurred in some cases this success was not universal and did not occur automatically or immediately:

“At first we were all too polite, but before the end we had relaxed a bit and were still positive, but offering proper feedback.” (IJ1)

For some students the academic staff role was required initially within the project in order to initiate discussion and critical feedback:

“We needed prompting to use it as more than a “look at what I’ve done!” blog and were giving each other constructive comments towards the end.” (IJ1)

This appeared to be for some students an issue of confidence in their own opinions and the ability to share their views with other students.

“I found the comments valuable but I think because of the ‘newness’ of the group it was a bit difficult to be completely honest. Also I’m sure that one’s opinions are only subjective, so I did not want to comment on the blog, lest it be misunderstood – would have preferred to discuss it in person with the others on a one to one basis.” (FFF1)

Whilst therefore it appears that the connectivist environment and blogs appeared to work well for some students the success of the blogs was not universal and whilst some blogs saw interaction from all of the group:

“Everyone actively left comments and feedback within good time” (TF1)

A number of students commented that posts and responses often came from the same students:

“Comments were usually from the same people it would have been nice to have feedback from all members.” (WWSY1)

“Some members were active and some were not. It was the inactive that concerned me.” (TF2)

This might therefore provide an indication that not all students were actively engaged or learning through collective blogs and therefore the connections required for learning to occur were not sufficiently strong. This manifested not just through lack of engagement but also through a lack of timely engagement. For example:

“A lot of people in our group didn’t post their work up on the blog until it had been submitted leaving no opportunity for other people from the group to suggest improvements.” (WWSY1)

It is important to note that for some students the technology itself appeared to be an issue and not all participants appeared to embrace the technology:
Elaine Garcia, Mel Brown and Ibrahim Elbeltagi

“We tended to do more in class/face to face than on blog…we did (show really early ideas) in person so no point in doing on blog for the sake of it.” (TI1)

It is important to note that whilst some students considered that face-to-face communication replaced online communications it is worth noting that all teams discussed using a variety of methods of communication.

Overall therefore it appears that students found connections, although to varying degrees, within the blogs and were able to use these to learn.

“We all used the team blog to display and discuss work as it progressed. It allowed us to critique each other and make suggestions.” (TF1)

Whilst the views of students have been considered it is necessary to consider the manner in which staff felt both their own and student roles changed as a result of the use of technology.

6.2 Staff Views of the changing nature of academic / student roles

From the staff results it is evident that academic staff felt their role within this project had changed from their usual role:

“The teaching team “played” the role of art director rather than tutor throughout…. Although students could approach staff for art direction whenever they wished only a handful of students took this opportunity consistently.” (ST1)

In this way therefore the academic staff considered that they were no longer:

“…Automatically the first port of call for asking for advice and feedback (as students) have to use each other for feedback outside of the classroom to get feedback on their own ideas through peer critique.” (ST2)

Lecturers therefore considered that students were largely self-managing their learning and considered that:

“Students not only learn individual skills in terms of working to briefs but they also develop critical thinking and reflection skills in terms of critiquing their own and others work.” (ST1)

However whilst this generally worked well it did result in a loss of critical review that students might receive, as students were “sometimes just too polite.” (ST2)

This therefore reflects the views of students who noted that peers were too polite and did not wish to be critical of each other although it appears this became less of an issue as connections between individuals became strengthened through interaction:

“The blogs setup for the race were not continued after the game had ended…and most students returned to their own peer group of friends to discuss their work.” (ST1)

This may therefore indicate that connections made were not strong or enduring or were perhaps not of high value to students. Alternatively however within a connectivist-learning model this could be expected as the specific relevance of the network did not necessarily exist any longer and so students choose to revert or build new networks.

Within this case study academic staff did not consider themselves to become part of the learning group but instead remained on the edges of the learning process and did not become peers as suggested within a connectivist model. Additionally however staff did not consider themselves to be removed from the learning process entirely:

“There was still a sense that we were still seen as authority figures with the race – setting the work, judging the editorials, providing critical feedback.” (ST1)

Staff considered that the lack of engagement by some students within the blog could affect the success of the project and the learning that occurs:

“It is clear that some students learnt so much more from the blog than others largely because as a whole group they were ensuring the blogs worked effectively for them. There’s that moment when an effective online critiquing community is completely dependent on that need for that community to be fully engaged.” (ST1)
Overall it would appear that academic staff considered their role did change to some extent as a result of blog usage. This however does not appear to entirely meet the expectations of the connectivist model of learning. The implications of these findings shall therefore be considered in more detail in terms of both the changing roles of staff and students as a result of the use of blogs.

7. Discussion

From the findings it is clear that both staff and students consider that the use of blogs within this project had a fundamental impact, not only in terms of the increased opportunities the technology allowed for collaboration and interaction, but also in terms of the roles students and staff held.

From both staff and student views a connectivist learning model appeared to be largely delivered through the use of blogs, as students were empowered to create peer communities and communicate, collaborate and interact using technology. However unlike the connectivist model, it is important to note that student groups were not self-initiated and networks did not form or grow organically outside of the groups staff assigned.

It would appear therefore that academic staff maintained an authoritative role within the learning process and whilst not engaging within the blog, as would be expected within a connectivist-learning model, were still looked to as an authoritative source of learning by students.

It would certainly appear that within this model the responsibility for learning did become more focused toward the student and the peer group however students did not appear to be able to fully engage with the level of peer critique and feedback that appears to be required in such a model although it did occur in some cases.

In terms of the role of staff it appears that the use of technology represented no barrier, as staff initiated the choice of such tools. It should be noted however that whilst staff had no input into the blogs themselves the selection of the tool as a suitable medium required an understanding of the capability of the tool.

The academic role in this case appeared to largely relate to the creation of the learning opportunity and the judging of final work as opposed to the usual guidance staff would give students throughout. This therefore placed a greater emphasis on the need for peer assessment and feedback.

Students who engaged with the task appeared to benefit, particularly as confidence grew and critiquing became easier. Where some students failed to engage, staff noted that this negatively affected the learning of all within the group. Within this case study staff did not check the engagement of students and therefore self-managed groups needed to be accountable for themselves, something which students perhaps found hard to adapt to, especially initially.

Overall it would appear that blogs do reflect many of the principles of a connectivist-learning environment and largely was a successful model in this case. In terms of the student role the need for students to take responsibility for their own learning and the creation of their own networks have on the whole occurred successfully and learning occurred as a result. Students however still appeared to look to staff as authority figures and appeared to do little to extend, manage or continue the network following the project.

Within a connectivist-learning model the manner in which staff would be expected to not be directly involved in student learning networks or involved only as a peer did appear to occur to some extent but not entirely. Staff were still required to play an authoritative role in the learning process although there does appear to be a degree of greater freedom for academic staff to be removed from each individual student’s learning process and to be able to critique on a more formal basis. For academic staff this role allowed a greater focus for students on the need for self-reflection and peer critique and this in turn allowed staff the opportunity to become removed from the individual learning process although not from the group learning activity.

8. Conclusions and recommendations

This research has examined the manner in which staff and student roles can be considered to change when using a connectivist-learning blog model. This study has found that the roles of staff and
students clearly change as a result of the use of blogs and these would largely appear to meet the expectations of a connectivist learning model but not entirely.

The findings from this case study would suggest that the use of blogs results in a student role which is more focused towards seeking and providing peer-critique, support and guidance and as a result there is a need for students to be fully engaged and willing participants within group learning. The student role in this model therefore becomes increasingly concerned with self-management and a need to take greater responsibility for individual learning, which does not necessarily occur naturally. For academic staff, roles also appear to change as a result of the use of blogs in a connectivist model. Due to the changes seen in student roles, academic staff become less involved in the individual learning process of each student and instead focus on providing the opportunities for learning and overall summative critique at the end of the task. This change will also not necessarily occur naturally and may need to be practised and refined by staff.

Whilst the changes in roles demonstrate that some elements of connectivism can be seen within this case study it is clear that these roles identified were not adopted in all cases, particularly amongst students. As a result some students may have failed to actively or fully engage with the project and consequently their level of learning may have been affected. This is likely to be resolved if the project were assessed and this would need to be carefully considered in the future when setting such activities.

From this case study it is possible to see that blog usage has had a positive effect on both staff and student roles and the learning that took place. However this was a relatively short project following which students appeared to disengage with the blogs created. The result of this case study therefore suggests a need for further empirical research to be conducted within this area.

Further research may consider the use of blogs within a longitudinal study, within other disciplines and with greater student numbers. In terms of a connectivist-learning model, the use of blogs should be continued and the use of external experts and self-organised groups could be utilised in order to further develop the positive changes seen in both student and staff roles.

References


THE EFFECTIVENESS OF COLLECTIVE GROUP BLOGS AS A TOOL FOR REFLECTION WITHIN EXPERIENTIAL LEARNING PROJECTS: A CASE STUDY OF SIMULATED WORK BASED LEARNING WITHIN HIGHER EDUCATION

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Abstract

The use of simulated work based learning, particularly in Art and Design education, provides an important opportunity for students to gain vital employability skills and experience such as the ability to work to deadlines, team work, the need to take creative direction and professional practice skills, all of which are vital when undertaking a commission from a client. When undertaking such activities it is possible for only surface learning to occur due to the manner in which the reflective activities required for deeper learning to occur can be missed or only applied on an individual basis.

One way in which this potentially could be assured is through the use of Web 2.0 technologies and more specifically through the use of a collective blog which can be utilised by both staff and students to record the experiences that have been undertaken and results of the learning that has occurred.

Benefits of the use of such technology are expected to include the asynchronous nature of the technology, the anytime, anyplace nature of blogs, the ability to receive comments and feedback and the nature of the posts as publicly visible to many audiences including the possibility to engage with external commentators such as industry specialists. However whilst benefits are expected it is also possible that failure may occur due to factors such as lack of group engagement, lack of acceptance of the technology, the privacy and trust issues that potentially surround the use of blogs and the potential issues of social loafing that may occur within an online group environment.

This research, based on previous presentations of this module and the experience from the academic year 2011/2012, therefore provides an evaluation of the use of a collective blog as a reflective tool within a simulated work based project within the subject area of Art and Design, a subject area in which technology is often rejected, and a roadmap for successful implementation as a result of the findings is provided.

Keywords: blogs, web 2.0, experiential learning, HE, work based learning, case study.

1 INTRODUCTION

The rise of internet based Web 2.0 and Social Media tools within the last decade have undoubtedly had a significant impact on the nature of society itself. \cite{1} The manner in which we communicate, socialise and work have all dramatically changed however this change has been surprisingly limited within the majority of the education sector.

The education sector has itself however also been subject to much change. An increasing focus on employability, links with industry and a push for vocationally focused provision, within Art and Design particularly, has represented a significant challenge in some cases, as these skills have traditionally not been of the highest priority to the sector.

The need to engage with these agendas where course group sizes can be large and work placement can be time consuming and costly has resulted in the need to consider the manner in which technology and more specifically Social Media and Web 2.0 tools may be able to support a simulated work based learning experience for students, specifically enabling them to work in groups, use technology that is increasingly common place within industry and to record the experiences and learning that has taken place throughout.

One of the tools that are increasingly being used to support this type of experiential learning activity are blogs. The benefits of using blogs within education and more specifically for this type of activity would appear to be numerous. However to date the outcomes of using such tools has been relatively poorly explored.
Before considering the experiences of using blogs as a tool for reflection within an experiential learning project it will firstly be important to consider what the expectations of reflection in experiential learning will be and the benefits that will be expected to be seen from the use of blogs to facilitate learning.

2 EXPERIENTIAL LEARNING

The manner in which experience can lead to learning is a concept which has been long discussed within educational theory. [2] It is important to note when reviewing the term experiential learning that it can be considered to represent two differing concepts. Firstly experiential learning can relate to the manner in which students are able to learn through undertaking learning within an authentic setting and secondly it can be defined as learning which takes place through everyday experiences that are undertaken. [2]

The most influential theory of experiential learning comes from the work of David Kolb who considers that learning occurs when knowledge is created through the transformation of experience.[3] In this way Kolb therefore places the emphasis of learning on the process undertaken rather than outcome and furthermore this process is a transformational one which results in knowledge being continuously created, adapted and changed as opposed to more traditional models in which knowledge and learning are transmissive and adaptive processes. [3]

In order to further clarify this process Kolb has created a learning model which has commonly become known as “the learning cycle” and which is based on four key components: Concrete experience, Reflective observation, Abstract conceptualisation and Active experimentation. [3] Each of these components areas are based upon the need for reflection to occur throughout the experience being undertaken. Within the model, experience takes place in an episodic manner but at the same time draws on the whole life experience of an individual due to the manner in which reflection occurs. [2] The model, as shown in Figure 1, represents a cycle of learning in which all four elements must be present in order for learning to successfully occur.

![The Learning Cycle](image)

**Figure 1 – The Learning Cycle**

Source: Clark [4]

The basis of learning within this cycle is reliant on the manner in which movement occurs between the four elements outlined and the method by which conflicts between the differing elements are resolved. [3] It is this respect that the concept holds most interest for the majority of commentators as it is in this way that both the procedural aspects of learning and interactive nature of learning are defined, both of which are at the heart of the structure of the learning process. [5]

This is an important consideration to make as Kolb’s learning cycle is also subject to much criticism. Jarvis et al [2] for example consider that the learning cycle is overly simple and more specifically consider that there are issues in the manner in which it concentrates only on the cognitive aspects of
experience rather than the physical and emotional aspects. Illeris [5] agrees with this view and additionally considers that the learning cycle is too simplistic and represents a simplification of reality although he also considers that there is value in the learning cycle in the manner in which it provides the understanding of the structural process of learning as discussed above and considers that the manner in which learning structured can provide a useful understanding of how learning can be acquired.

The acquisition of learning can be understood to exist within the learning cycle from the existence of two dimensions. Firstly the processing or transformation dimension exists on the horizontal axis and is considered to exist between the elements of intention and reflection and observation and extension. [3][5] The second dimension is the “prehension” or perception dimension which provides an axis between immediate conceptualisation and an adapted or reflective comprehension. [3][4][5] The four aspects of the learning cycle can therefore be understood to exist within these two dimensions with concrete experience and abstract conceptualization and active experimentation and reflective observation representing opposing orientations on the axis.

Clark [4] further defines each of the steps within the learning process as follows:

Concrete Experience: Is the process by which we learn from experiences and relating to others. In this step we are sensitive to others feelings.

Reflective Observation: In this step we observe situations before making judgements and view experiences from a range of perspectives. In this step we are looking for the meaning of things.

Abstract Conceptualization: In this step we will look to undertake logical analysis of a situation and the ideas relating to it and will act upon our intellectual understanding of this.

Active Experimentation: In this step we will get things done through action and will aim to influence people and events.

It is important to note that the experiences undertaken are not necessarily required to be directly experienced and may be primary (directly experienced), secondary (mediated) and may be formed from actual (at the time), recalled (recalled real memories) or artificial experiences (some aspects of real experience). [2] The manner in which experiences can therefore be undertaken allows learning to be extended to a range of situations and provides a greater flexibility to the manner in which learning can occur.

3 BLOGS & EXPERIENTIAL LEARNING

The experiential learning process and cycle described above is considered to be well supported by the use of blogs primarily due to the manner in which blogs enable a flexible [6][7] interactive [8][9][7] and easy to use method [10][11][12] of reading and writing reflectively [13][14][1] on the experiences that have occurred and the lessons which have been gained from these experiences, all of which would be more difficult using other more traditional mediums. [15] It is in this manner that blogs therefore enable the creation of social and peer learning communities which support learning [16]

Blogs also provide an opportunity for others to both read and comment on the posts allowing the sharing of experiences to occur [17] and discussion around an experience for both the learner and other potential authentic audiences. [11][9][18] The manner in which this occurs allows for not only primary but secondary experiences to be used for learning and actual, recalled and artificial experiences to also be utilised due to the anytime, anyplace nature of blogs. [19][20][21][22]

There are four ways in which blogs can be considered to enable learning to occur: writing, reading, receiving comments and posting comments. It is important to note however that blogs do also allow a great deal of flexibility in their use allowing many types of media to be posted including text, images, videos, links and a flexibility in terms of both audiences and authors specifically where collective blogs are used.

Collective blogs are expected to be particularly beneficial within a learning context as they can allow opportunities for the collecting and sharing of learning resources, ideas, opinions, and experience. [23][24][15][25] Collective blogs also provide opportunities for collaborative activities in which individuals can be fully involved in sharing, creating, analysing and evaluating knowledge alongside their peers through communication and interaction which is social and conversational in nature. [25] In this manner therefore a collective blog should provide opportunities for peer facilitated learning [19][15] and provide greater opportunities for feedback to be given and received [15][26] all of which
are vital in an experiential learning experience. Deng and Yuen [11] in fact consider each of the four main aspects of blogging to be reflective activities with writing being considered a self-reflective process, reading being reflection triggered by reading and commenting representing reflective dialogue and this can also be incorporated into the learning cycle as seen within Figure 2.

Figure 2 – Kolb’s Learning Cycle with Blog Usage and Reflection Activities

However additionally the learning experience within a blog can be adversely affected by poor reflection within the blogs themselves [23] and require students to take greater responsibility for their own learning. [20] Overall however blogs have been shown to be able to assist with the experiential learning process and to result in a mitigation of some negative behaviours, such as non-participation, which may be improved through blogs particularly where students may not wish to speak within a face to face discussion group. [14]

4 METHODOLOGY

This research will use content analysis (CA) and observation to analyse the use of collective blogs which could be used by both staff and students to post their views on their learning experience. CA is a process which allows a systematic analysis of messages that are present in any type of communication. CA has been used to analyse the structure, purpose, and themes found in blogs. This research will use CA analysis to analyse both qualitative and quantitative data analysis.

Coding was executed by researchers involved in this study. The content will be analysed using categories that include the type of post, number of images in the post, number of links, number of comments, time after post comment made, number of text lines in the post, and finally evaluating whether the comments reflect any kind of experiential learning.

The coding was agreed upon amongst the researchers and where the researchers disagreed about any of the categories, negotiation was pursued until a consensus was reached.

5 CASE STUDY INSTITUTION

Plymouth College of Art is a specialist College providing Further and Higher, art, design and media, education to approximately 1,500 students. The BA (Hons) Illustration course is a three year under graduate programme which can also be undertaken as a two year Foundation Degree programme. The Programme Leader has been in post for approximately three years and leads a small team of lecturers who teach on this programme and also the BA (Hons) Graphic Design which the Programme
Leader also manages. The programme has been running at the College for approximately six years and has seen a steady increase in enrolments during this time. The total student cohort currently stands at 106 students with 56 students within year 1, 33 within year two and 16 within year 3.

In the second year of the BA (Hons) and FD Illustration Degree, students can undertake an optional module called “Illustrative Practices” which seeks to develop work based learning skills, namely, to work to a commission for a client and visually interpret a message that needs to be conveyed to a particular audience in a given context. This is undertaken through the use of a competitive game entitled The “Great Editorial Race” (GER) which forms a significant part of the module, in an assignment called “Competitive Spirit”, and aims to introduce students to the concept of the traditional client-led brief within the confines of the classroom and enables students to gain experience of working collaboratively within teams whilst also competing against others to “win the job”.

The teams are required to select a captain who is responsible for the creation of a collaborative team blog which will be used throughout the three week period of the project to support in class sessions. During this time student teams are expected to create a minimum of ten illustrations which are required to be placed within a pre-determined editorial context and which will be judged by “the client” who within the GER are the Programme lecturers.

The GER establishes the need to work to a deadline with one winning illustration being awarded a predetermined amount of fictional “illustrated pounds” with further awards of fifty per cent of the prize awarded for second place. It should be noted however that amounts won each time will depend upon the complexity of the editorial itself. Teams are free to submit more than one entry per commission and thereby increase their chances in winning both first and second place but this will also increase their workloads. It should be noted that penalties for those who fail to submit on time were determined as double the prize amount although where penalties occurred these were not revealed to the group until the end of the race. The winning team is revealed at the end of the GER as the team who have been awarded the most “illustrated pounds” minus any fines issued.

The aim of the collective team blog was to establish an enclosed online space to post ideas, research and sketches ready for feedback from the group before submission occurred via an email to the Programme Leader. It was hoped that the blogs would ensure that students could develop an online community for their team providing space for support, guidance, critiquing and reflective learning thus mimicking and providing opportunity for students to reflect upon the group critique skills being developed each week in the studio and on skills required in a working environment. It should be noted however that the degree of success within the GER would not affect student outcomes as this aspect of the project would not be assessed and students were made aware that only individual project work would be graded.

Team membership was predetermined by the teaching team who aimed to ensure that teams were evenly distributed in terms of gender, age, characteristics (i.e. dominant / passive) and performance (i.e. high, medium and low). In total 32 students were participating within this module and this therefore led to the creation of six teams, two of which had six members and four of which had five members. In this case three of the team collective blogs have been analysed representing the blog which resulted in the most activity, Fubar (FB) the blog with the least activity, The Increditorials (IN) and one which fell between in each of these extremes, We Will Shock You (WWSY).

6 FINDINGS

Across the three blogs analysed a total of 127 posts were made and 289 comments. Of these 64% of the total posts were seen within the FB team blog with a further 19% within the WWSY and 17% within the IN blog. A similar pattern can be seen within the comments made with the highest level of comments made within FB with 78% of the total comments made within this blog. This was again followed by WWSY which had 15% of the total comments made and finally IN which had significantly less of the overall comments made totalling 7% of the total.

It would therefore appear that the greater the number of comments and posts the greater the extent to which students will learn from their experiences. However it is important to note that within WWSY students also stated that ‘we all kept in contact via Facebook as well.’ (WWSY, Member 6) This was in addition to using the blog and students appear to have felt that this meant that this therefore ensured that their group worked effectively. Within feedback from IN, students stated that ‘we tended to do more in class / face to face than on blog.’ (IN, Member 2) Whilst therefore both of these groups were using other tools to keep in touch it is interesting to note that team FB also ‘used text (messaging) to
let each other know when there was a new post to comment on’ (FB, Team 5) and yet still participated fully within the blogging activity.

The results across all blogs do however suggest that the degree to which experiential learning takes place is also highest within FB with 67% of the total experiential learning within posts seen to occur within this blog followed by WWSY with 19% and finally IN with 15%. Again the differences between posts and comments show more pronounced results with 71% of the total experiential learning within comments occurring within FB followed by 21% within WWSY and 8% within IN.

It is important to note however that this pattern relates only to the number of images included within the blog, the comments made and the quantity of text that exists for each. Learning additionally appears to occur in relation to the extent to which students draw on their own experiences, ask for feedback and in which posts and comments appear to build on previous messages. In relation to initiating new ideas for discussion there does not appear to be a relationship between blogging and learning however it is important to note that in these cases the frequency of learning occurring in this way was low. Occurrences in which materials from outside the course were referenced were also relatively low and this may therefore affect the results seen. It is interesting to note therefore that within FB Member 5 stated that ‘links to help with research and inspiration to see how people got their ideas would be nice to see.’

It is also important to highlight, due to the context of the learning, within Art and Design education in this case, that the total number of images across all blogs appears to be relatively high particularly when compared to factors such as links made which would traditionally be seen as far more important within the blogging activity. It also appears that within FB the number of images posted was significantly higher when compared to the other team blogs. The blog had 70% of the total images posted. This was followed by WWSY with 20% and finally IN which had 10% of the total images posted. It should be noted that the percentages of images posted also appear to quite closely match the extent to which experiential learning occurs within each of the blogs possibly highlight a link between the number of images posted and the extent to which reflective learning occurs.

Table 1, shown below, provides a breakdown of the categories analysed and details the manner in which learning can be seen to occur. Within this table the rankings for each area are also shown and clearly demonstrate that in each case both the information relating to posts and the learning that occurred was most significantly seen within FB followed by WWSY and finally IN with the exceptions noted above.
Table 1 – Information relating to individual posts and extent to which experiential learning occurred within posts and comments relating to posts

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Images</td>
<td>147</td>
<td>21</td>
</tr>
<tr>
<td>No. of Comments</td>
<td>226</td>
<td>19</td>
</tr>
<tr>
<td>No. of links</td>
<td>86</td>
<td>1</td>
</tr>
</tbody>
</table>

Whilst learning can therefore be seen to occur to the greatest extent within FB followed by WWSY blog and lastly within IN, the results above do not demonstrate whether learning occurred amongst all learners but rather indicates that learning is expected to have generally occurred. As there appears to be a link between the extent to which comments and posts are made it will be interesting to consider the extent to which members of the differing teams engaged with the activity. The total number of comments and posts made by each member of the team are shown below in table 2.

Table 2 – No. of Comments and posts made per student within each team blog

<table>
<thead>
<tr>
<th>Team</th>
<th>Captain</th>
<th>Member 2</th>
<th>Member 3</th>
<th>Member 4</th>
<th>Member 5</th>
<th>Member 6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comments</td>
<td>Posts</td>
<td>Comments</td>
<td>Posts</td>
<td>Comments</td>
<td>Posts</td>
<td>Comments</td>
</tr>
<tr>
<td>Incridentorials (IN)</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>We will shock you (WWSY)</td>
<td>16</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Fuban (FB)</td>
<td>42</td>
<td>26</td>
<td>71</td>
<td>19</td>
<td>59</td>
<td>14</td>
<td>33</td>
</tr>
</tbody>
</table>

From the total number of comments and posts left per person it is clear that there is a greater general level of engagement amongst FB than the other two teams. Within FB each member of the team can be seen to have added a number of comments and posts with the lowest contributing members of this team contributing more than the total posts and comments made on either of the two other blogs. It is interesting to note however within this group that Member 2 considered that ‘some members were active and some were not. It was the inactive (team members) that concerned me.’

This is perhaps surprising when considering that within both IN and WWSY at least one member of the team failed to leave any comments and within each team a further team member also failed to leave more than one comments. Within the IN team the maximum number of comments left by a
single individual totalled 7 whilst WWSY totalled 16 and FB totalled 71. In terms of posts the maximum number left for IN totalled 8 whilst WWSY totalled 7 and FB totalled 26.

It would appear also from this analysis that FB had a much higher average of comments per post with an average of 2.8 comments per post whilst WWSY had 1.8 comments per post and IN had 0.9 comments per post indicating a lack of discussion and interaction between individuals within the blogs ranked lower for learning when compared to the highest ranked blog.

The lack of comments in part within WWSY can be attributed to the manner in which some group members ‘didn’t post their work up on the blog until it had been submitted leaving no opportunity for other people from the group to suggest improvements.’ (WWSY, Captain) Additionally within this blog those involved appear to be frustrated by the manner in which ‘comments were usually from the same people. It would have been nice to have feedback from all members.’ (WWSY, Member 6)

Within both WWSY and IN blog student comments suggested that students often posted editorialis too late in order for constructive feedback to be given. This appears to largely highlight issues of effective group working as those students who felt that posting earlier would have been useful do not appear to feel able to tackle this issue with other group members. ‘Maybe somehow, if we agreed to show really early ideas (the blog would have had more value)... but we did this in person so no point in doing on the blog for the sake of it.’ (IN, Member 2)

In comparison FB members considered that it was in their individual interests to provide honest and critical feedback as they ‘all wanted useful feedback that would in the long run improve (their) work.’ (FB, Member 5) Within the general feedback at the end of the project a member of FB reflected on the process and considered that ‘we kept a constant supply of work from rough ideas, development to final outcomes, giving feedback and advice to help further the ideas’ and this allowed them ‘to critique each other and make suggestions.’

Within general feedback at the end of the project it appears that some students felt that more emphasis should be placed on the need for all students to participate within the blogging activity and students noted that this may be improved if greater access to a wider range of audiences were made available. This therefore provides evidence of the extent to which students felt the experiential learning environment, which although simulated, had a ‘real-life feel’, was helpful and may be further enhanced through greater access to authentic audiences, something which is noted as key in the use of blogs.

7 DISCUSSION

From the findings presented above it is clear that experiential and reflective learning has occurred within the blogs analysed to varying degrees. It would appear that where the blog is used to a greater extent the degree to which learning occurs also rises. When considering the use of blogs as a tool for reflective learning it is only within FB that the full cycle of learning can truly be seen to have developed. Within both WWSY and IN it would appear as though the perception continuum is less well developed as students have been either unwilling to engage in the blogging aspect of the task or unable to get others to respond. Therefore even where students may be posting to the blog and thereby undertaking self-reflection without a commitment from others within the group to respond to posts students will be unable to engage in reflective dialogue.

The absence of comments within WWSY and IN indicates that there is perhaps a lack of reading of posts amongst students and therefore reflection triggered by reading may not be occurring. This is somewhat difficult to assess however due to the overall lack of evidence of reading blogs, also known as lurking, and therefore it is not possible to know whether all reading results in reflective activities and a desire to comment or whether reading can be a relatively passive and non-reflective activity.

Negative behaviours of non-participation within the case of WWSY or IN do not appear to have been overcome through the use of blogs although it is important to note that where a lack of engagement does appear students reported that they were discussing their work through other mediums such as Facebook or within face to face sessions. This however appears to be contradictory to the comments made by those students who provided general feedback at the end of the project who claimed that the reasons for the lack of constructive feedback was due to the late posting of images which in some cases occurred after submission resulting in constructive feedback being largely irrelevant.

In FB there does appear to be evidence of reflective learning that occurs as a result of the use of blogs. In the FB blog students appear to post with the aim of seeking feedback via comments. Other
students reflect on images posted by reading the post and responding accordingly with constructive and timely feedback allowing the cycle of reflection to continue to build.

The evidence of this also encourages others to reflect on their own work and to ask for feedback. In this way the group appears to learn to be more reflective, critical and engaged and the use of the blog continues to be useful to the group as a tool for learning.

The nature of the blogging activity as not being an assessed element of the module may have resulted in the lack of engagement within the task for some students and may be a way in which students may be more motivated to participate in the future. This may particularly be the case if the task is considered to be an involved activity which may require time and reflective thought to be undertaken.

Overall it would appear that the use of blogs within an Art and Design context can be successful but the manner in which students may interact as a result of the visual nature of the subject may be different from other subjects. It could be suggested that students within the visual arts will find it easier to reflect on visual mediums and therefore the use of images within the blog will be beneficial to their style of learning.

8 CONCLUSIONS AND RECOMMENDATIONS

This study has considered the extent to which collective blogs can be used to support experiential learning within a simulated work based learning project. The study has found that there does appear to be evidence to suggest that collective blogs are able to support reflective and experiential learning but that this is dependent upon the individual engagement of students within the group and the presence of all four key aspects of blogging behaviour: reading, writing, leaving comments and receiving comments and as a result the four reflective activities of self-reflection, reflection triggered by reading and reflective dialogue.

Within the study it is also clear that reflective learning does not occur within every collective blog and that in reality the extent to which learning occurs will depend upon the group involved within the blog as, within smaller learning communities, a lack of engagement by one or more members appears to detrimentally affect the extent to which the learning cycle and process can be developed and supported for any of the students involved.

It would appear additionally that blogs may be a suitable manner for Art and Design students to collaborate and undertake experiential learning online due to the manner in which blogs allow images to be posted, comments to be made and discussion to occur and images to be reposted and that this may be a unique feature of the visual arts education sector. This however will need further investigation and all results are based on a relatively small sample within a relatively short project.

In future studies it may be possible to consider the manner in which engagement with blogging activities may be affected by assessment and whether this may further enhance or inhibit effective reflective learning experiences. Additionally future studies may also consider the manner in which blogs may be used to engage with wider authentic audiences in relation to both individual and collective blogs and the use of longitudinal studies may be useful within this context.

Overall it would appear that the use of collective blogs as a tool to develop reflective learning is something that should be considered to be a worthwhile activity and something which should be further investigated in the future through the continued use and evaluation of such tools by both the staff teams that will be running the modules and the students that will be expected to engage with others using blogs.

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Evaluating the use of Social Networking Sites as a Tool for Knowledge Sharing for Developing Higher Education in Developing Countries: An Exploratory Study of Egypt and Iraq

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Abstract: Educational institutions are today facing increasing pressures due to economic, political and social upheaval. This is only exacerbated by the nature of education as an intangible good which relies upon the intellectual assets of the organisation in terms of its staff. It is within this context that Social Networking Sites (SNS) offer an important potential alternative method to manage and share knowledge within educational institutions. The focus of this research therefore explores the role that SNS could play in relation to the development of Higher Education (HE) within developing countries with a focus on the countries of Egypt and Iraq as having one of the highest and lowest rates of internet usage within the Middle East respectively. In order to gain a better understanding of the potential drivers and barriers to the use of SNS as a knowledge sharing (KS) tool within educational institutions, within the developing world, a case study approach has been used. This approach consisted of semi-structured interviews with forty members of staff, both senior managers and academic staff, within Mansoura University’s Faculty of Commerce in Egypt and Al-Mustansirya University’s Faculty of Economy and Administration in Iraq. The results show there are both areas of agreement and difference in the views of staff within both institutions. In both cases issues of culture appear to affect the participation of female staff and additionally age appears to be a predictor of use. However between the institutions there appears to be wider differences relating to the existence of KS strategies, the extent to which staff understand the nature of SNS and technology in general and the extent to which Senior Managers and other staff views are shared. Overall the results suggest that Mansoura University in Egypt is far more prepared for the use of SNS as a KS tool and some usage appears to already be occurring. Within Al-Mustansirya University, Iraq however the usage of SNS as an organisational tool appears to be unlikely to occur within considerable promotion and changes to strategic drivers.

Keywords: social networking sites, developing countries, case study, higher education, knowledge sharing

1. Introduction

The education sector is today facing an increasingly challenging period. Global recession, increased competition, globalisation, technological advances and demand for increasing educational quality (Mathew, 2010) are all leading to a need for education across the world to become increasingly competitive, efficient and innovative.

Within this context Knowledge Management (KM) represents an imperative area of consideration in terms of capturing, organizing and sharing organisational knowledge (Liao et al., 2004) to maximise and fully exploit the intellectual assets institutions hold.

The use of Social Networking Sites (SNS) offers potential to share organisational knowledge within educational institutions as they allow for the capturing of tacit knowledge and allowing Knowledge Sharing (KS) to occur which in turn provides greater opportunities for creating new knowledge and innovative practices.

SNS are also currently appearing to have a substantial impact specifically within developing countries where a number of political events have recently been reportedly influenced by SNS. These include Egypt, (Idle & Nunns; 2011; Alexander, 2011; Nabi, 2011) Tunisia, (Delany, 2011), Libya (Beaumont, 2011) and Pakistan. (Sutter, 2011; Hill, 2011, Blair, 2011)

Whilst the growth of Facebook, the largest and most well known SNS has slowed and user numbers have decreased in the countries in which it was first launched, this has been tempered by growth in developing countries within the last few months (Arthur, 2011).
According to the Spot on PR Report (2010), shown in Figure 1, the number of Arab internet users has reached more than 65 million whilst Arabic Facebook users are now predicted to total more than 15 million.

![MENA's Top Five Facebook Communities](image)

**Figure 1**: Middle East and North Africa’s (MENA’s) top five Facebook communities source: Spot on PR (2010)

Based on this report the largest number of Facebook users exist within Egypt followed by Saudi Arabia and in both cases SNS have been used to mobilize collective action toward breakthroughs in social, educational, economic and political contexts as discussed above.

By comparison in Iraq, internet penetration is amongst the lowest in the Middle East with just over 1% of the population being able to access the Internet. Therefore the Iraqi use of SNS is relatively low although there is growth of membership within the country.

It is important to note also that whilst there is an increasing number of Muslim based SNS these appear to have relatively low membership and are not a preferred means of networking for the majority of the Arabic population. (Dashan, 2011) The majority of Arabic users appear to prefer sites such as Facebook which have promoted international use through marketing and the provision of 43 translations of the site. (Facebook, 2011)

The reasons for lower usage in Iraq whilst numerous are likely to include political instability and the Iraq War which led to the destruction of the ICT infrastructure of the country which is only now more thoroughly restored.

Due to the clear differentiation between these two countries this paper shall focus on Egypt and Iraq as the highest and lowest users of SNS within the Middle East.

### 2. Knowledge Management and Knowledge Sharing

KM and KS have been the subject of much research and scrutiny in recent years. KM can largely be defined from two perspectives. The first has its roots in the concepts of Artificial Intelligence (AI) and subsequent Information Systems (IS) developments.

This perspective relies on the ability to codify knowledge in order to share it (Barnes, 2007; Snowden, 2005; Schutt, 2003) and therefore relies on knowledge in explicit form, not dealing with tacit forms. (Hildreth & Kimble, 2002)
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The process by which tacit knowledge can be shared is therefore the subject of the second generation of KM which is particularly relevant where products are largely intangible and often shared through a process of socialisation. (Nonaka & Takeuchi, 1995).

It is therefore the nature of SNS as a popular web 2.0 tool which encourages and supports socialisation that makes systems such as Facebook a relevant proposition for KM.

3. Social Networking Sites

In terms of KS the main benefit from SNS is the manner in which they 'would let us see who knows what, who does what and even who controls what and update us continuously on all of these fronts.' (Donath, 2007)

Additionally, the popularity of existing sites suggests that, the use of SNS would be relatively straightforward. However the motivation for existing use may not always be compatible with organisational KM and may lead to conflicted motivation for continued use ultimately affecting the ability of KS to occur. (OFCOM, 2008; Ardichvilli, Page & Wentling 2003)

The main issue is ‘what makes a social network function isn’t so much the tools as it is the attitude you’ve got to have to “want to” and that isn’t something you can get out of a box.’ (Suarez, 2007) In terms of existing users the motivation to use SNS as a tool for KS may not necessarily be compatible with primary usage. (Ardichvilli, Page & Wentling, 2003)

Further important factors affecting the motivation for SNS use will relate to the desire for individuals to have ownership, trust and privacy of their information and knowledge.

For non-users privacy concerns will largely relate to issues of personal safety (OFCOM, 2008; Hewitt & Forte, 2006) and a desire not to share personal information with a wide group, particularly if they are not chosen but due to shared organisational connections.

For existing users privacy concerns are likely to relate to the combining of personal and public use particularly as others can inform what is posted and therefore visible about an individual. (Dwyer et al, 2007; Barnes, 2007)

Furthermore privacy concerns could relate to the sharing of proprietary information or even libellous or defamatory comments across the internet which could prove to be a problem both individually and organisationally. (APQC, n.d; Go, 2007)

In terms of KS, barriers may also exist from the fundamental way in which these sites operate. Information posted can become the property of the software company and therefore its unauthorised reuse cannot be guaranteed. (Jones & Soltren, 2005; Schonfeld, 2009)

Any information posted is also persistent and accumulative making it searchable, replicable and available to any number of invisible audiences for an indeterminate period of time. (Cain, 2007; Barnes, 2007, Dwyer et al., 2007)

McConnell (2008) however considers that there is a great deal of “paranoia” concerning the privacy and inappropriate use of personal data on the internet and a balanced view of these issues is required.

Whilst a number of barriers are considered perhaps the most prevalent area for consideration must be the nature of relationships and specifically the manner in which weak ties can be utilised and strengthened through the use of a SNS. (Donath, 2007; Boyd & Ellison, 2007)

The strength of weak ties within an SNS are likely to lead to a large network especially where existing users already hold a personal network of friends and family. However it is important also to consider that networks can become too large and unmanageable.

Donath (2007) places the maximum number of relationships an individual can have at 150. In a large organisation this could be easily exceeded when considering that the average Facebook user will already have 120 confirmed friends. (Sandberg, 2009)
Elaine Garcia et al.

The nature of organisations and the limited maximum number of relationships could lead to the creation of silos as homogenous groups remain separated and offline relationships are simply replicated online, no further enhancing KS or communication across the organisation. (Boyd & Ellison, 2009)

In addition there are likely to be a number of individuals who are less familiar with technology and who may become segregated from the KS activities of the organisation resulting in a lack of completeness across the organisation.

The nature of technology acceptance and use represents a fundamental barrier to the use of SNS as a KM tool and indicates the need for adequate training, technical support and senior management support to ensure that individuals who may not traditionally use SNS will be encouraged to trial use within an organisational context.

4. Methodology

Generally previous studies have used a qualitative approach to identify the barriers to the use of SNS as a KM tool. This approach is most appropriate due to the assumption that access to the reality of a situation is only possible through social construction. (Smith et al, 2008)

A qualitative approach seeks to answer questions posed by studying different social settings. As noted by Berg (2009), qualitative techniques make it possible for researchers to participate in understanding and perceiving others, as well as permitting them to discover how people structure their daily lives to make them more meaningful.

According to Creswell and Clark (2011) the advantages of utilising this approach are numerous:

- It provides a suitable means of studying complex phenomena.
- It attempts to interpret and describe people’s personal experiences of phenomena.
- It tries to understand the process of interaction between individuals.
- It allows participants to share their views.

Therefore the validity of the results of this approach is high (Creswell, 2009).

4.1 Case study

Case studies are increasingly used as research tools (Creswell, 2007) and according to Yin (2009) investigate holistically and feature real-life events. Moreover, case studies are uniquely strong as they are able to deal with a variety of evidence, i.e. documents, interviews, etc (Saunders et al., 2009), thus providing a more detailed view of the issue under consideration (Yin, 2009). In addition Siggelkow (2007) indicates that case studies are beneficial in order to understand the significance of the research questions posed and to encourage new ideas.

In order to investigate the drivers and barriers that affect the use of SNS as a KS tool in order to develop HE in Egypt and Iraq, case studies will be undertaken, one institution in Egypt and one in Iraq.

4.2 Interviews

In this case study interviews, which Gray (2009) defines as a conversation between people, whereby one party assumes the role of the researcher, will be used. According to Hair et al. (2007) this method is helpful where issues are complex as it enables the researcher to receive feedback.

In both institutions semi-structured interviews were conducted with participants enabling the researchers to explore and investigate opinions from respondents, giving them the opportunity to both analyse in-depth and expand upon their answer (Gray, 2009)

This method appeared to be suitable as it elicits the assumptions and stories participants hold about the issues under consideration.
4.3 Data analysis
A total of 40 managers within Al-Mustansirya University in Iraq and Mansoura University in Egypt were interviewed using open-ended questions and consisted of Deputy Deans (DD), Heads of Department (HD), Academic Heads (AH) and academic staff (AS).

The interview results were analysed using narrative analysis. This method is defined by Saunders et al. (2009) as ‘an account of experience that is told in a sequential way, indicating a flow of related events that, taken together, are significant for the narrator and which convey meaning to the researcher.’ This method allows the stories people employ in recounting events to be emphasized and analysed.

The advantages of this method include factors such as its expedient nature and the way it allows an examination of the social background of the interviewee, the relationship between individuals and the interviewee’s views of the organisation (Smith et al., 2008).

5. Case study institutions

5.1 Mansoura University in Egypt – Faculty of Commerce
Mansoura University was established in 1972 under the name East Delta University but had existed as a branch of Cairo University since 1962 and is now one of 17 State owned Universities within Egypt.

The Faculty of Commerce was established in 1973/1974 and currently has 22,000 students enrolled. After the civil unrest within Egypt in January 2011 a small number of academic staff at the institution established a Facebook group for the purpose of networking and KS within the faculty with an aim to assist in the development of HE within the institution. Currently this group has 123 members.

5.2 Al-Mustansirya University in Iraq - Faculty of Economy and Administration
Al-Mustansirya University is affiliated to the Ministry of HE and Scientific Research and was established in 1963.

The Faculty of Economy and Administration was founded in 1963. The Faculty has had a relatively variable enrolment level in the last few years and current enrolments stand at 733 students. The institute faces a number of challenges and changes, in terms of its structure, curriculum, approaches and resources particularly due to political instability over the last two decades.

6. Findings

6.1 Existence of KS strategy
From the interviews, it appears a contradiction exists regarding the existence of a KS strategy within Al-Mustansirya. Some interviewees for example, claim there is no strategy for KS within the University whilst others consider a strategy does exist under an alternative name.

Largely those further down the organisation consider a strategy does exist indicating a lack of clarity, a lack of communication or a desire for interviewees to appear to be aware of potential strategies of which they have no knowledge.

The Deputy Dean did however state:

“There is no particular strategy, but I think there are recognizable priorities for KS.”

(DD.2)

This may therefore lead to others to believe that these priorities represent the KS strategy within the organisation. The Deputy Dean also stated that such a strategy was imperative in the future, reflecting the acceptance of the need for a KS strategy.

Within Mansoura similar results were found with general staff considering a KS strategy exists and only one senior manager agreeing that it does. Two senior managers did however identify the need to focus on informal not formal KS providing an indication of some awareness of KM approaches and strategies.
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In comparison it is clear there is greater clarity within Mansoura regarding the existence of a strategy for KS in addition to the need to focus on both formal and informal KS although in both institutions confusion existed as to the existence of a KS strategy reflecting different results from senior managers and other staff.

6.2 Acceptance of use

In relation to the acceptance of use, the findings from Al-Mustansirya clearly indicated that the University does not encourage the use of SNS and resistance to use exists across the organisation.

Staff across the University acknowledged that SNS were becoming widespread amongst student communities but this led to an expectation that SNS can solely be used for social purposes and are therefore inappropriate for work use.

Some managers could comprehend that SNS use for exchanging and disseminating knowledge was useful and thus SNS use could benefit the institution but on the whole inappropriate comments, issues of trust and privacy in addition to concerns about the low levels of technological capabilities of staff all act as barriers to use.

It should be noted however that technological capabilities appear to be influenced by age as a Head of Department within Al-Mustansirya stated:

“Some of the staff do not like to enter these sites due to their age and they lack understanding about how to use technology...... By contrast, these sites are used frequently by young staff” (HD1).

In Mansoura University however all interviewees agreed that SNS could have a large role in future KS and particularly for the dissemination of knowledge, between staff or between staff and students to the extent that:

“People feel free and relax when they express their views through this medium more than face to face communication” (SM.1)

The key differences between the two institutions appear to relate to technological capabilities which in Mansoura ranges between good and acceptable although again there are higher skills levels seen amongst younger staff that tend to be more familiar with the technology.

In terms of other barriers to use the two institutions are relatively similar with issues of bullying, security, privacy and trust all prevalent within Mansoura in addition to Al-Mustansirya.

Within Mansoura some concerns were often expressed by staff relating to the triviality of SNS:

“There are a lot of issues raised on SNS that are trivial and to read or comment on it is just wasting time”. (AS5).

This may, as in Al-Mustansirya, reflect concerns relating to the social nature of SNS and the types of communications and information that is shared on these sites.

Through the interviews it became clear that the use of SNS is associated with negative images and culture in the minds of some people generally as a reflection of religious views within the region:

“The negative culture of the users of SNS is a big barrier for use” (AS1)

In practice this means that if you are using SNS you are immoral and this is especially the case for female users. This view is reflected by the manner in which most female academic users do not put their real pictures on the sites and are currently underrepresented on SNS.

Within the Mansoura University, Faculty of Commerce group on the facebook which contain 123 members of staff, only five of the forty female members put their photo on the site and of these three are with their husbands. This was expressed by one of the female members of academic staff who said that:

“.... One of the most serious issues for female users is the privacy”. (AS9).

Thus it can be concluded that the lack of acceptance of SNS within both institutions is the result of a lack of technological skill (linked to age), concerns relating to bullying or inappropriate comments,
issues of privacy, trust and security, and, the ambiguity of perceived benefits aside from social relationships.

The issues of age and gender are important considerations within the context of SNS in both institutions and can be difficult to measure due to the nature of these groups where females and elderly members of staff are underrepresented within both institutions either due to the familiarity with the technology or due to the threat of privacy.

Issues of gender are likely to be directly linked to religious, cultural and social norms within Arab states and therefore may continue to exist or take time to change as political and social change occurs within the region.

Issues of gender may also be linked to age as due to these sites only recently entering the Arab world, younger generations are more conversant and comfortable with them and this may result in greater acceptance as the technology and population matures.

6.3 Motivation for use

In terms of motivation for use within Al-Mustansirya there appears to be a contradiction regarding the extent to which KS is encouraged within the institution for whilst the Deputy Dean and Departmental Heads indicated KS is open and encouraged, academic staff claim it is constrained:

“We always hear the term “open culture” at work but if you try to share ideas with somebody higher than you in the organisational structure you will find a wall” (AS.8).

However, all interviewees agreed motivations for use will include benefits such as networking, self-expression and KS enhancement particularly in informal environments.

There was additionally however some resistance to motivation for use due to some of the issues previously found such as the perception of sites as solely social:

“I consider these sites social. It is custom only to use them only for communicating with friends and relatives” (AS.7).

However within Mansoura, where some use of SNS is already occurring and common as indicated by one interviewee who did consider the social aspect of SNS to be useful for KS:

“SNS are useful in increasing the social bond of the staff which increases job satisfaction and makes the work environment more likable” (AS3).

Furthermore within Mansoura the existing use of SNS appears to a greater understanding of potential benefits as all interviewees agree that Mansoura is already benefitting from SNS use. These benefits vary from networking, global KS, speed of communication, constructive feedback, supporting innovation, generating new ideas, mass opinion polling cheaply, developing more social/collaborative views of learning, improved motivation, engagement, creating a connection to real-life learning and finally flexibility of use as one of the interviewees at Mansoura commented:

“SNS technology is already available free of charge to many people either at home, work or even while they are on move. This makes it very easy and quick to use” (AS1).

The existing use within Mansoura also highlights the role that senior managers play in motivating staff to use such sites as whilst senior managers consider that SNS can act as a sensor to evaluate the popularity of their decisions and as a way to disseminate information to staff:

“SNS are a good way to know the problems within the school and respond to it quickly” (SM5).

However from observation of the Mansoura Faculty group within Facebook and the interviews undertaken it would appear that the contributions from senior managers are relatively limited and this is noticed by staff:

I felt that the use of SNS by senior management within the school is just as a public-relations tool rather than a means of communication and solving people problems” (AS11).
It would appear that this lack of contribution is considered to also indicate a lack of commitment from senior managers and this is considered by academic staff to result in confusion and a lack of clear direction:

“Lack of purpose and clarity of common goals of using these websites in terms of the conflict of the nature of use .......will continue in the future until we have more commitment from both senior management and academic staff” (AS6).

To conclude it is clear that there are no clear policies in place within either institution to adopt and use SNS as a KS tool however the organic growth of a community of this nature within Mansoura would appear to suggest that the institution is in the early stages of adoption and may be of significance in the future.

It is also clear from the results that Arabic culture and social norms play important roles in the use of SNS within these countries. Females in both countries tended to be more concerned about online privacy than males. There is, nonetheless, a general acceptance and recognition that SNS encourage and enable discussion, communication and KS.

7. Discussion

From the findings it is clear that these institutions are at very differing points of development in terms of SNS usage, KS strategy and technology usage.

To some extent the differences appear to highlight the importance of senior management support for whilst Mansoura appears to have a KS strategy and SNS policy in place and thereby some acceptance of SNS use, Al-Mustansirya has neither. This therefore appears to highlight the importance of senior management support, as identified in the literature, for achieving the use of SNS for KS.

From both institutions issues of privacy, trust and openness seem to be prevalent. This interestingly relates to concerns identified in the previous literature but there is also a cultural dimension relating to issues of gender that are evident within Arab nations as a wider cultural issue. This consideration is not one which has been given a great deal of attention within the area of SNS literature as the majority of previous studies focus upon the role of SNS within the developed world; largely within the USA and UK.

In relation to privacy and trust, as within previous studies, there appear to be a number of concerns relating to the informal nature of SNS and the manner in which users are required to combine personal and professional profiles. In addition it would appear that the inclusion of “social” within the name of such tools gives users a sense that the sites are not serious and cannot be used for work. This view is supported in both institutions. This therefore suggests that the name of the site is value laden and represents a barrier to use.

Technological barriers appear to be present within both institutions but are to some extent related to age. Increased barriers to use relating to technology within Al-Mustansirya may exist more due to the nature of the organisation, its culture and strategy than necessarily in relation to individual usage although previous literature has suggested that age may be a factor.

Within Al-Mustansirya for example there is no clear KS strategy and this perhaps reflects that the institution does not know how knowledge transfer can be accomplished effectively and certainly how SNS could assist in enabling this to occur.

The two institutions appear to be at different stages of cultural acceptance of SNS as would be predicted from the number of existing users of Facebook within both countries. Whilst Egypt appears to be reporting benefits already from using such tools and support comes from the possibilities of social bonding, free software and easily accessible sites, within Iraq benefits relate to networking, self-expression and knowledge enhancement but its role outside that of a communication tool for friends and family is difficult for interviewees to comprehend.

Overall the findings appear to suggest that the higher usage of SNS within Egypt does result in a greater acceptance and understanding of the role that SNS could play in KS whilst the slower gain in usage within Iraq seems to result in lower acceptance of formal use within the workplace.
8. Conclusions and recommendations

This research has examined the drivers and barriers to using SNS for KS to develop HE in developing countries. The study found that there are contradictions and differences in viewpoints concerning the application of SNS as a KS tool and therefore factors which act as both barriers and drivers to usage within developing countries.

Within both institutions studied there is clear evidence of the need to ensure that KS strategies are put in place and for this to be achieved greater senior manager support will be vital. Within Mansoura the manner in which SNS adoption is already occurring and SNS are considered to be valuable for KS particularly demonstrates the advantages that can be gained. Potentially the sharing of this best practice within and between the two institutions considered here and more widely than this may be one way in which the promotion of KS strategies and SNS could be achieved. This would be particularly effective if SNS was the vehicle used to promote such activities as it would demonstrate the manner in which SNS enable institutions to create global communities conveniently and cheaply.

Using SNS as the vehicle to share best practice would not however overcome the barriers that exist due to lack of technological and IT skills particularly seen within the Iraqi University. It is expected that as the technological infrastructure of Iraq is more fully developed the country will become more technologically capable however it will be important that technology is highlighted within the institution and where possible training, assistance and the promotion of technology as a tool to assist in KS will be undertaken. This, to some extent will depend upon budget constraints and wider investment within the country. It may however be possible for the institution to make use of mobile technologies, which are usually more reliable and available throughout the country, to demonstrate the use of SNS and the ease of use of such technology, particularly to older staff that it appeared were less accepting of technology use than younger staff.

Whilst senior management support and technological barriers should be relatively easy to overcome the issues of privacy and trust, particularly relating to cultural and social norms within the region will be harder to overcome.

Again the development of best practice groups and exposure to SNS will undoubtedly alleviate some of these concerns, particularly if privacy settings and user controls are explained and a recommendation for appropriately sensitive privacy settings can be provided. Furthermore if an institution wide approach were to be taken and agreement concerning pictures and personal details to be included were agreed by all affected groups, but to be implemented by all staff, this may assist in both exposing individuals to and determining the appropriateness of SNS use within the institution.

Once again the sharing of best practice between institutions may be useful in enabling issues such cultural and social norms to be discussed and previous experience by some may be promote future usage by others through discussion of concerns and the manner in which these may have already been overcome within another institution.

It is important to note particularly that the use of sites that have been developed specifically for Muslim communities do not appear to date to have been popular however this may be due to the lack of interest in such sites due to the technological barriers discussion above. It may therefore be of interest for institutions with specific social and cultural issues to investigate the use of such sites and more successful sites such as Facebook as either may represent a potential SNS solution for the institution and an integration of both may provide an optimum solution if it can be achieved.

Overall there was broad agreement that there were advantages to employing such sites, given that SNS aim to facilitate KS amongst users. The research therefore concludes that the Iraqi University should adopt SNS and draw upon their benefits as a KS tool. Additionally, for effective change the institution should work to achieve clear communication amongst staff and implement strategic plans to encourage the KS during working hours. The time has come for the institutions not only to dispel the ignorance of SNS but also to make academic staff aware of their necessity. The adoption of new strategies to seize SNS is an absolute must – to the irrefutable benefit of senior staff in their bid to accomplish an elevated echelon of communication with all other affiliates of their institutions.
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