Where are the digital natives? Identifying and mapping digital literacy skills of students and teachers in an international college.

Tanya Prescott

A Research & Development Project
Submitted for the
MSc Learning and Teaching 2015

DEPOSIT AND CONSULTATION OF THESIS

One copy of your dissertation will be deposited in the Department of Education Library via the WebLearn site where it is intended to be available for consultation by all Library users. In order to facilitate this, the following form should be completed which will be inserted in the library copy your dissertation.

Note that some graphs/tables may be removed in order to comply with copyright restrictions.

Surname	Prescott
First Name	Tanya
Faculty Board	Education
Title of Dissertation	Where are the digital natives? Identifying and mapping digital literacy skills of students and teachers in an international college.

Declaration by the candidate as author of the dissertation

1. I understand that I am the owner of this dissertation and that the copyright rests with me unless I specifically transfer it to another person.

2. I understand that the Department requires that I shall deposit a copy of my dissertation in the Department of Education Library via the WebLearn site where it shall be available for consultation, and that reproductions of it may be made for other Libraries so that it can be available to those who to consult it elsewhere. I understand that the Library, before allowing my dissertation to be consulted either in the original or in reproduced form, will require each person wishing to consult it to sign a declaration that he or she recognises that the copyright of this thesis belongs to me. I permit limited copying of my dissertation by individuals (no more than 5% or one chapter) for personal research use. No quotation from it and no information derived from it may be published without my prior written consent and I undertake to supply a current address to the Library so this consent can be sought.

3. I agree that my dissertation shall be available for consultation in accordance with paragraph 2 above.

DEDICATION

In memory of Kam.

ACKNOWLEDGEMENTS

My sincere thanks go to my patient supervisor, Rebecca Eynon, who provided excellent direction and timely inspiration and support.

Thank you to Julia, Mike and Paul from the college who supported me during the MSc. Many thanks to Zelga: an outstanding teacher and an inspirational friend and colleague.

Special thanks to Rui, whose support and encouragement were awesome. My thanks also go to Barbara, who worked selflessly with me on getting the Skills Audit done and is a great leader for the AP team. Thank you to all the AP team and teachers at the college. You are a great team to be part of: always willing to share and collaborate and go for a drink with too.

Thank you to my dear friends who know how tough it's been this summer. I love you and thank you: Ines, Jenny, Alison and Robert.

CONTENTS

APPENDICES

TABLES

FIGURES

Abstract

This research aimed to identify and map the digital literacy skills of students and teachers in an international college. Digital literacy is increasing in importance: effective digital literacy skills now determine the level of access to an individual's economic future and full digital citizenship. Conversely, a lack of digital skills excludes individuals from digital life, including being able to contribute to the discourses that are shaping their future. In the college, the contact time for teaching basic digital literacy skills to students has been cut by 50%. In addition to this, the weekly hours for providing training and mentoring support for teachers to develop their digital literacy, through the Advanced Practitioner team, have been cut by 50%. Therefore there was a need to find out how the digital literacy skills of students and teachers are developing in this environment. This study firstly carried out an extensive review of the current empirical research in this field before proceeding with three action research cycles, which involved 69 research participants: 24 students and 45 teachers. The data collection methods included 5 online student learning journals, an online survey (skills audit) for teachers and feedback sheets gathered from a focus group of teachers. Collaboration with teachers to develop the action research cycles was a key feature of the study and Activity Theory was used as an additional analytical lens. The findings revealed that students have limited access to opportunities to develop their digital literacy in lessons. They are asking for help to develop their digital literacy skills and knowledge, whilst acknowledging that they have gaps in their knowledge. Furthermore, they want teachers to develop their digital expertise so that they can collaborate with them to help them navigate the digital world. The findings of the skills audit revealed that with a few exceptions, generally teachers in the college only feel confident in the basic use of learning technologies. The findings evidence that digital literacy is an important issue that has been overlooked in this setting, with ramifications for how the college and the wider organisation are perceived by potential students/future customers. The key recommendation is for a strategic approach to the issue of digital literacy to be adopted by the college/wider organisation, which must include: improving access to learning technologies for students by further embedding digital literacy across the curriculum; plus upskilling teachers by providing a comprehensive time-tabled programme of digital literacy training.

Key words: digital literacy, digital natives, access, e-safety, Activity Theory

Chapter One - Introduction

Today's students need to prepare for living in a future world, the parameters of which appear to be constantly shifting. In the college where I work, the international students come from all over the world to prepare for university and life beyond. According to government discourse, academic literature and policy discussions (Reynolds & Stryszowski, 2014; OECD, 2013; Commission, 2015; Eynon & Malmberg, 2011), as the reach of the digital age extends into every aspect of modern life, the need to equip students with the skills and abilities to survive and thrive in this environment becomes more pressing. For this reason, Michael Wills (1999), a former minister for Learning and Technology, described knowledge of and ability to use technology, as 'the indispensable grammar of modern life'.

1.1 Research Rationale

Ever since Prensky (2001) muted the idea that young people were digital natives, that is, able to interact seamlessly with the digital world, whether that be devices, online communities or software programmes; there has been a fierce debate about the veracity of such a bold statement. The previous action research pilot project[1] , considered this issue by focusing on the digital dissonance of students in the college. That research found students tended to fall into two groups: those who lacked confidence in their digital skills and therefore underestimated their own skills and those who tended to over-estimate their digital skills. Helping these students was found to be more problematic because they were not aware of the gaps in their digital knowledge. In addition, the study also found some teachers overestimated the digital skills and competency students had.

[1] 'Digital dissonance and academic self-concept: exploring student experiences of digital literacy' on MLT Part 2

Whilst raising awareness of these issues is important, in addition a more nuanced and detailed exploration of this issue was deemed necessary in order to offer students effective support and to ensure that their teachers were equipped to help them. This is because the curriculum does not appear to provide the breadth and depth needed to support students in this important area, plus the contact time for information technology teaching has been cut by 50%. Additionally, the learning technologies team, who provide training and mentoring for teachers, has had its allocated hours reduced by 50% and teachers no longer have learning technologies training embedded into their weekly timetable. This experience has been replicated across all four colleges which form part of the larger organisation. Furthermore, the organisation runs international study centres located on university campuses, which do not provide any IT teaching for students. It could be argued this is an indication that the issue of digital literacy has either been overlooked or is not being given the importance it warrants in the organisation. If the organisation as a whole and the college where I work, in particular, hope to effectively prepare students for their future careers and lives, then there is a pressing need to identify how the curriculum can support students in developing their digital literacy and how teachers can be thoroughly equipped to deliver this. The current research therefore proceeds on the premise that students and teachers have a range of digital skills and abilities, as well as gaps in their digital skills and abilities. What and where they are, is not clear and this is what this research intends to investigate.

The international college proved to be an ideal setting for this research. It is marketed as a modern college which has leading edge technology in every class room and a well-resourced online learning platform to provide opportunities for students to work collaboratively and develop their independent study skills for university. I work in the college as an IT and Politics teacher and programme manager and therefore, have an ideal strategic and operational perspective. I am also part of a team of teachers who operate across the four colleges and international study centres to train and mentor

teachers to use learning technologies. We regularly collaborate on projects, seeking to advance the use of learning technologies across the curriculum and this current research project is part of that collaborative work.

A further reason why this college has proved to be an ideal site for this research is due to the consequences of restructuring within the organisation as a whole. Re-structuring issues and significant staff turnover have led to knowledge loss within the organisation and one areas this is most noticeable in, is in the digital skills of teachers. In addition, there has been a tendency in the past, to underplay the importance of digital skills for teachers with the result that prospective teachers are not required to have any digital literacy skills. Furthermore, prior to the start of this research, there was no strategic organisational policy for training that reflected a commitment to addressing these issues. Therefore, the digital literacy of students and teachers warranted an intervention which formed the basis for this research.

In the current research, a focus solely on technical skills was felt to be too narrow and one that would not necessarily do justice to the spectrum of digital literacy students and teachers possess. Equally, it would not go far enough in identifying the range of digital skills and abilities students need in order to equip themselves well in a digital age, nor the skills and knowledge teachers need in order to support them fully to achieve these goals. A definition of digital literacy that was broader in its reach was needed. The literature review explores the empirical research dealing with digital literacy more extensively but in this introduction chapter, there is a need to provide succinct definitions of the terms digital literacy and digital native that may furnish the reader with the clarification to make sense of the initial discussion here.

When considering the term ‘digital literacy’, a definition from JISC (2014) will be used for this study, and as a starting point for engaging in a debate about how the term is defined, which will be expanded upon further in the literature review. ‘Digital literacies

are those capabilities which fit an individual for living, learning and working in a digital society'(JISC, 2014). The fact that JISC describes digital literacy in plural as 'literacies', emphasises the multiple context specific, time influenced, nature of the skills, abilities and knowledge people need to fully contribute to and cope with living in a digital age. For the term 'digital native', a definition is taken from Helsper and Eynon (2010, p.506) as 'someone who multi-tasks, has access to a range of new technologies, is confident in their use of technologies, uses the Internet as a first port of call for information and…uses the Internet for learning as well as other activities'.

1.2 Research Aim and Objectives

This research seeks to identify and map the skills of students and teachers in an international college and this will be achieved by asking students to identify and assess their digital literacy and to identify what support they need from teachers. Teachers will be asked to identify their digital literacy in a clearly defined area of learning technologies available in the college. Therefore the initial research questions were identified as:

1. How do students define digital literacy?
2. How do teachers define digital literacy?
3. Where are the gaps in support for students and teachers?

Successful outcomes for this research would include: the college committing to develop the digital literacy of students by further embedding it in the curriculum; developing the digital skills of teachers through offering more targeted teacher training and supporting continuous professional development in this area. It is hoped that as a result of this research staff within the college and wider organisation will understand how significant the issue of digital literacy is in the education of students.

This chapter has outlined why research into the digital literacy skills of students and teachers is needed within the college by providing the rationale behind the current study.

In the next chapter, the literature review will further contextualise the issue of digital literacy by exploring its multifaceted complexity, establishing the main topical issues, before linking with the current study to demonstrate how it contributes to new thinking in this field,. Debates about the parameters of digital literacy will be considered, plus the concept of Activity Theory will be presented as an additional analytical lens for the research.

Chapter Two - Literature Review

From the introductory chapter, the aim of this action research project was established: to identify and map the digital literacy skills of students and teachers in the college where I work. Having established the aim and key issue that this research seeks to address, the initial research questions supporting this are:

1. How do students define digital literacy?
2. How do teachers define digital literacy?
3. Where are the gaps in support for students and teachers?

In addressing these questions, the literature review will commence with investigating the current empirical research on digital literacy with a view to scrutinising existing definitions and establishing the key elements that need to be considered in this research. The literature review will then proceed to consider how Activity Theory can add an extra depth of reflexivity and interrogation of the relationships at play in the classroom and the wider environment, foregrounding the more subtle connections that might otherwise be overlooked.

2.1 Digital Literacy – What's in a definition?

A working definition of digital literacy from JISC (2014) was provided in the introductory chapter. The evolution of definitions of digital literacy can be traced through the empirical research (Gilster, 1997, Ba et al., 2002, Martin & Grudziecki, 2007, JISC, 2011). Current definitions are non-specific in naming the technologies to be employed and this is an acknowledgement that in such a fast developing field, technology quickly becomes obsolete but the skills, abilities and habits needed are of key importance (Montgomery, 2014; Ng, 2012; Simsek & Simsek, 2013; Bennett et al., 2008; Zhong, 2011; Kuiper et al., 2009). In addition, it is an acknowledgement that technology use is often context specific. JISC (2011) identifies seven elements of digital literacy:

1. Media literacy
2. Information literacy
3. Digital scholarship
4. Learning skills
5. ICT Literacy
6. Career and identity management
7. Communication and collaboration

Additionally, the term ‘new literacies’ (Simsek & Simsek, 2013; Ng, 2012) coined to include such practices as adding emoticons in text messages, evidences how the terms are constantly evolving to reflect the changing nature of the digital world. Hatlevik and Christophersen (2013, p.241) moot that ‘the concepts seem to have gradually shifted focus from the simple use of digital tools, often linked to concepts such as digital skills, to broader terms, including the students’ digital competence and literacy’.

In the current research, digital literacy is a term that encompasses several different types of literacy and includes written literacies ‘conceptualised broadly as reading (in its widest, multi-modal, multi-media sense) and writing or more specifically textual practice in digital contexts’ (Lea, 2013, p.109). Lea makes a valid point that in focusing on the ‘literacy’ in ‘digital literacy’, the aim is to bring back the focus on meaning making: the use of language and its social, historical and cultural use. Fairclough (1999) developed critical discourse analysis as a way of interrogating how texts are created, to reveal meanings that help to reinforce power and ideology in society and of particular relevance to this research, technological determinism (Voithofer & Foley, 2007). By examining texts, being able to analyse the signs and symbols in them, it is possible to understand how ‘changing practices of language use (discourse) connect with…wider processes of social and cultural change’ (Fairclough, 1992, p.269). In this way, it is possible to understand Lea’s (2013, p.113) contention, that within the discourse on digital literacy, ‘digital’ risks becoming a bye word for ‘broad capability agendas, consumerist models of learners and deficit models of teachers’.

In a similar vein, Hague and Paynton (2010, p.5) make a case for critical engagement and evaluation to be part of digital literacy. These are skills that will enable students to question how they are engaging with the digital world and consider critically the statements, images, videos or any material that they encounter: This would seem particularly significant given empirical research which argues that different policy decisions seek to dictate the exact focus of the digital literacy experience that students may have at college or school. In particular, research by Montgomery (2014, p.199) points to contexts in which students with already restricted opportunities to access technology, have a narrowed curriculum due to the pressure to use technology for weekly 'technology enhanced assessments' rather than 'meeting the educational needs and interests of students growing up in an increasingly digitized world'.

2.1.1 Digital Literacy and Citizenship

For Simsek and Simsek (2013) digital literacy is inextricably linked to digital citizenship and democracy; with individuals needing to master this literacy in order to fully contribute. The European Commission's (2015) 'Europe 2020 Strategy' has 'promoting digital literacy, skills and inclusion' as one of the seven pillars of its 'Digital Agenda'. Moreover, writing about the new curriculum priorities for the newly formed state of Kosovo, Beqiri (2010, p.8) attests to the importance of digital literacy for helping young people (and indeed the whole population) to 'engage competently in public affairs, and to be active and responsible citizens in a pluralistic and democratic society'. Beqiri (2010, p.16) argues that the competencies of a 'creative thinker' will belong to a citizen who is able to critically think and contribute to the knowledge economy.

Schools, colleges and universities have a vital role to play in helping their students to become the 'active and responsible citizens' that Beqiri (2010) refers to. These

educational establishments need to 'insure that more young people acquire the skills and competencies, as well as the technological access, required for meaningful participation' (Jenkins, 2013, p.271). Helping students to understand the importance of digital literacy is of strategic importance because it cannot be assumed that they are digital natives.

2.2 Digital Natives

The now infamous claim by Prensky (2001, p.1) was that young people are '…Digital Natives'. Prensky claimed young people can navigate the digital environment in a seamless way, able to fluently speak and understand the language of digital life: 'Our students today are all "native speakers" of the digital language of computers, video games and the Internet' (Prensky, 2001, p.1). Yet, there is a body evidence to show that his claim is not supported by empirical research (Bennett et al., 2008; Crook, 2012; Helsper & Eynon, 2010; Nelson et al., 2010; Erstad, 2012) and does not warrant use as a generalisation. However, I think that Prensky articulated a concern that has its roots in an anecdotal perception that students are familiar with all things digital. I often hear comments of this nature in the college where I work. I would argue that this assumption needs challenging where ever it is made because it has almost gathered a meme like quality (Dawkins, 1976) and research shows that the issue is much more complex, as will now be illustrated through selected research on the issue.

An indication that the digital natives label is an oversimplification of the issue is offered by Bennet et al. (2008, p.780) who draw upon a body of research literature which attests to the differences in ability amongst young people, some of which are due to developmental differences. Likewise, Beckman et al. (2014, p.15) discovered students in their research did not create much content online and were predominantly occupied with 'consumption of information'. Furthermore, Hatlevik and Christophersen (2013, p.246) report a '…wide variation in the students' performance in digital competence'

amongst 4027 students in their research. Similarly, Helsper and Eynon (2010, p.515) conclude from their research that 'there are significant differences between cohorts of young people in terms of their preferences, skills and use of new technologies'.

For students being labelled as 'digital natives' when indeed they may have gaps in their skills, raises the issue of whether or not the digital natives label undermines their agency and leaves them vulnerable to a lack of support in educational establishments. The discourse used, for example, through government policy (OECD, 2013), driven as it is by economic agendas, may obscure the need for a comprehensive discussion about the complex range of educational and training needs that young people need, to be digitally literate. In fact, there is evidence that despite students being labelled as digital natives, a significant number of students are actually lacking some of the most basic and essential traditional academic skills that are requisite to being digitally literate.

2.2.1 Traditional academic skills

Indeed, Bulger et al. (2014, p.1581) found that the 'primary underpinnings of digital literacy are based on the same kind of academic knowledge involved in traditional forms of scholarship', proving that being able to find and use information effectively was not dependent solely on having effective digital skills. In research by Asher and Duke (2011, p.34) one of the respondents commented that 'students are not aware of the difference between a good source, a mediocre source and a terrible source'. Nevertheless Lea and Jones (2011, p.379), caution against the 'deficit model of student writing and learning'. The deficit model overlooks the complexities that students encounter in adapting to studying at higher level, as well as the more tailored support that they may need (Lea & Street, 2006, p.376). Hence, Lea and Jones (2011, p.390) found that students had to develop a complex set of skills to enable them to find and read information and were 'adept at drawing on complex, hybrid, textual genres'. Whilst it needs to be acknowledged that these studies were focused on higher education, the

early development of these skills in much younger students is similarly critical. Young people need to be supported to develop digital literacy at the earliest age, given that they are now exposed to the digital world from their most formative stages. One significant way in which schools and colleges can ensure this happens is by addressing access issues.

2.3 Access Issues

Access issues in educational settings directly impact on the digital literacy that young people develop (Montgomery, 2014; Ng, 2012) . Where students from socioeconomic backgrounds are not able to get access to computers, laptops and tablets at home to support their school studies; if they similarly encounter limited access at school or college, this can affect development of their digital literacy (Montgomery, 2014). Ba et al. (2002, p.33) moot that students from lower income households rely more on 'formal help providers' such as teachers for troubleshooting. Moreover, students from middle income families whose parents had advanced digital skills 'developed through work and schooling…engaged them in critical talk about the web' by comparison with the parents of low income families (Ba et al., 2002,p.33).

Notably, Ng (2012) suggests that students are often denied opportunities to be exposed to new technologies in educational institutions and yet this situation does not preclude them from being digital natives. However, Jenkins et al. (2009, p.xii) persuasively argue that students need the support of educational institutions to have equal and full access. Even Ng (2012, p.1066) argues that it is the business of schools and colleges to be exposing students to learning technologies and this includes raising 'awareness of the range of educational technologies that the digital natives could use for learning'.

In line with Ng's findings, Beckman et al. (2014, p.8) found though students were in educational settings where a wide range of technology was available, 'many of these technologies were seldom used'. The research considered student's technology use through the framework of Bourdieu's (1986) sociological theory on different types of capital (cultural, social, economic, symbolic), that is, competences, knowledge, practices and qualification. When students had limited opportunities at school to use technology, this limited their social and cultural capital because they were only developing 'low level skills and knowledge' (Beckman et al., 2014, p.15). Being able to access the participatory culture, that Jenkins et al.(2009, p.103), say is epitomised by the 'skills and cultural competencies' young people develop online, links with Bourdieu's (1986) theory of social and cultural capital and Moll and Greenberg's (1990) 'funds of knowledge'. Jenkins et al. (2009, .p.xii) suggest that this participatory culture is becoming the new 'hidden curriculum' of the digital age and who gets access to it, will determine who 'will succeed and [who] will be left behind as they enter school and the workplace'.

Furthermore, Dornisch (2013) considers that some of these limited access opportunities may be due to students feeling more comfortable than teachers with technology. However, I disagree with the generalisation 'digital natives in our education system' (Dornisch, 2013, p.222) and the research did not include teacher perceptions of their own comfort with using technologies. Nevertheless, Ba et al. (2002, p.37) confirm that 'the way teachers ask students to use computers' has an impact on how student digital literacy skills develop. Teachers have an essential role to play in helping students to access and use technology collaboratively in an educational context, as a 'site for the negotiation of knowledge' rather than 'as a depository' (Crook, 2012, p.71). As Young (2009, p.15) attests, educational institutes need to 'take the knowledge base of the curriculum very seriously…They have to ask the question 'Is this curriculum a means by which pupils can acquire powerful knowledge?''. Ensuring that the curriculum offers students adequate opportunities to develop robust digital literacy skills is imperative,

especially as Helsper and Eynon confirm (2010, p.515) that 'immersion in a digital environment' is significant in 'predicting if someone is a digital native'.

In comparing the digital experiences of students from a range of socio-economic backgrounds Ba et al. (2002), demonstrated the impact of culture, context and environment on a student's digital fluency. Whilst it is worth noting that Ba et al. (2002, p32) found that those students who spent more time online developed 'more robust skills in online communication and authoring'; it does prompt the question as to whether this robustness amongst students includes a greater element of discernment or critical reflection (Goodfellow, 2011). Another contextual factor that the research of Ba et al. (2002) did not consider, and this may well be dictated by the date of when the research was carried out, is the use of smart mobile phones by students. With the increased availability of smart phones amongst students with internet access, this may have an influence on the development of students' digital literacy skills even if outside a formal education setting (Furlong & Davies, 2012; de Lange, 2011). In an age when most students have access to mobile phones and a significant number have smart phones and therefore internet access, they have occasions to develop digital literacy skills, especially via social media, involving their peer group and online communities (Hague & Payton, 2010, p.14).

In this respect, young people have the potential to use their peers to help them learn new skills, practice and acquire new knowledge: an experience that connects to Vygotsky's (1978) concept of the zone of proximal development and 'what the child can do in cooperation now, it can do independently tomorrow' (Van Der Veer, 2007, p.83). Even where there are criticisms that students are mainly consuming information and not producing information, I think this makes the case stronger for why students need teachers to facilitate their learning, help them to use technology for learning and why classrooms need to welcome and harness the skills and knowledge that students do have for using technology, where appropriate. Yet, this is not to ignore discourse on the

digital divide, nor the impact of educational policy discourse on the skills gap, which serves to undermine teacher agency (Lea, 2013)

2.4 Digital Literacy - Competing Discourses

There is a policy discourse which argues: 'the responsibility for addressing technology equity rests squarely on the shoulders of teachers' (Voithofer & Foley, 2007, p.17), through its idealisation of teachers as 'agents of change' who can ensure digital equity. I agree with Voithofer and Foley (2007, p.17) that such rhetoric reduces a complicated issue that has an impact from local to national, even global level, to one that can be solved primarily at the micro level of the classroom. Although that research focused on policy in the USA, the complexity of the issue of the digital divide and what can be learnt from policy initiatives that failed there, can be used to inform policy and research here in the UK (Brandtzaeg et al., 2011; Eynon & Malmberg, 2011; Eynon, 2009; Ferro et al., 2011; Helsper & Eynon, 2010).

Closely linked with this, Lea (2013) argues that the discourse on digital literacy that promotes the skills gap amongst teachers similarly serves to promote an economic agenda. This agenda undermines teacher agency by lessening in importance the significant ability of teachers to educate students in critiquing literacy, as part of critical discourse analysis that helps to locate texts in their true social and cultural context. Indeed, Lea (2013) reasons this ability to educate students to be able to critically engage with the discourses of text is a key function of digital literacy and academic institutions because it helps to reveal the ideology and power relations being conveyed through language. Furthermore, Fairclough (1992, p.290), drawing on the work of Gramsci, Foucault, Bakhtin and Habermas, asserts it is only by critiquing the texts of everyday, for example media headlines and articles, can it be understood how these texts are 'colonised with meanings…invested with ideologies… used for strategic purposes'.

Language is both ‘socially shaped and socially situated’ and includes ‘semiotic practice in other semiotic modalities’ (Fairclough, 1999, p.134) such as video and photography. Given the power of critical discourse analysis to unearth how meaning making is not only created but transformed and distorted, I agree with Lea (2013, p.106) there should also be a focus on the ‘interaction [of technology] with different kinds of textual practices’.

The caution of creating a deficit culture solely focused on what teachers and students cannot deliver is well made, if one accepts teachers have an important role to play in helping their students to interpret texts, as Lea (2013, p.114) cogently articulates ’without either reifying technologies or decontextualizing practice’. This is why within the current research, the term digital literacies embraces all these different aspects, including competency and critical discourse.

Furthermore, Pow and Fu (2012, p.298) in stating that digital literacy ‘develops students’ abilities to employ these digital technologies for generating constructive social practices’, cogently identify why digital literacy is essential for citizens of the future. In a knowledge based economy, an individual’s ability to create with others and navigate through different digital communities will be of key importance. This is why Jenkins et al. (2009, p.xiii) contend a change of focus is needed: away from ‘questions of technological access to those of opportunities for participation and the development of cultural competencies and social skills’. The ‘participatory cultures’ Jenkins et al. refer to will offer students the prospect of collaborating and communicating globally but in turn will require them to ‘go beyond creating multimodal texts to knowing how to design these texts using visual rhetoric’ (Jenkins et al., 2009, p.xiii).

2.5 Activity Theory and Digital Literacy

Activity Theory has the potential to bring 'alive' the complex but hidden world of interactions in the Web 2.0 and help to consider it from multiple perspectives within an activity system (Sam, 2012). This is due to Activity Theory's ability to reveal the relationship between a subject and an object when an activity takes place, and also the other relationships involved. This makes it an ideal analytical lens for use in the current research. This study will use Engestrom's (1994) Activity Theory, which was developed from the work of Vygotsky (1978; Roth & Lee, 2007)and Leont'ev (1981). Engestrom's (1994) premise of 'teachers as collaborative thinkers' fits well with the aims of this study, with its emphasis on collaboration between teachers, as researchers, participants, and facilitators of opportunities for collaborative learning with students.

Vygotsky (1978) who developed cultural historical theory, hypothesised that 'cultures develop cultural tools to develop specific problems' and 'human mental development is inextricably tied to the mastering of cultural tools that tend to be different in different historical periods' (Van Der Veer, 2007, p.74). Whilst there is probably little argument that language is probably the most important cultural tool, the medium through which it is conveyed has changed dramatically with the advent of the internet and Web 2.0 technologies. Engestrom developed the activity system as a way of dealing with 'socially situated practice', that when applied to the classroom helps to contextualise the interrelationships in the activity system with the potential for 'transformative development' to occur (Avis, 2009, p.152).

The diagram below (Figure 2.1), illustrates the activity system, in which Engestrom (1994, p.45), explains, 'activity is a 'collective, systemic formation that has a complex mediational structure'. As a teacher working with the students, I can for example, be the subject and by making students the object of the activity system, then investigate the relationships between the various elements in the system, such as how the tools shape

the relationship between the teacher and the students, or how the students alter the tools by finding new ways of using them and the effect that this has on relationships within the activity system. Mediational tools form part of the activity, for example, when asking students to use particular software to create a website. If the activity is to create a learning journal on the website then an outcome could be the learning the students gain from an activity, depending on what the focus of the lesson is.

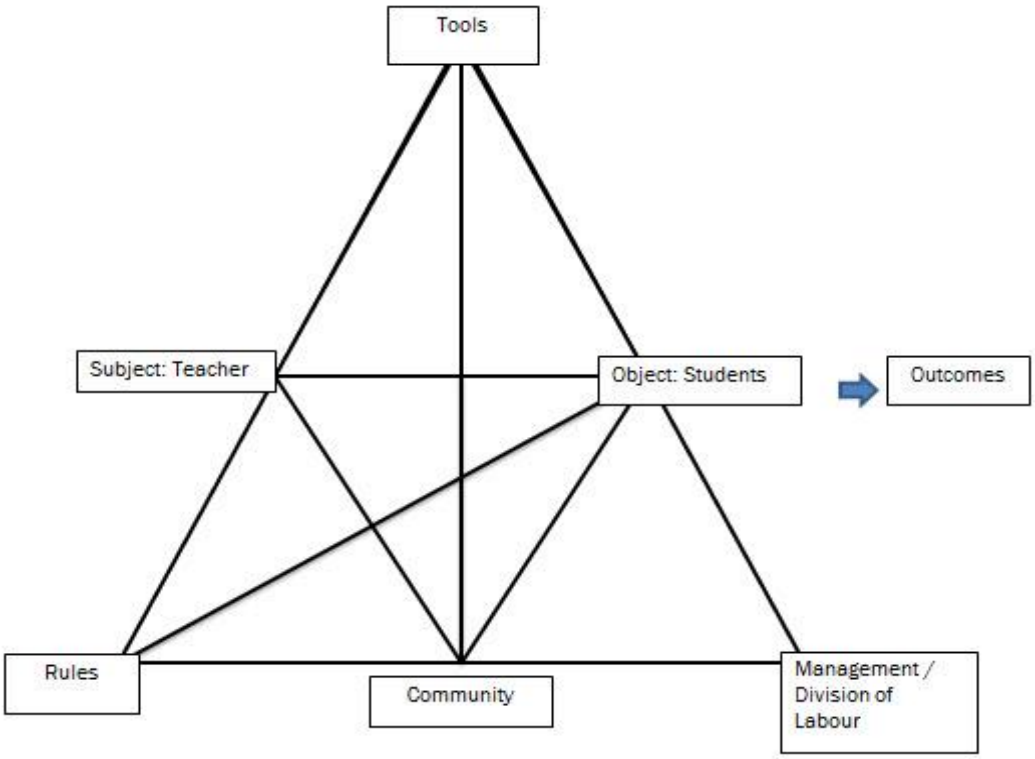


Figure 2.1: Activity System adapted from Engestrom, 1994

However, the activity system contains other elements which have mediating effects as shown by the lines drawn between the elements, for example, rules, which could be college, curriculum rules, as well as cultural norms, such as netiquette.

Engestrom's (1994) activity system has been shown to have room for adaption, in that it fails to make more explicit the relationship between elements such as rules and management and rules and artefact (Stevenson, 2008, p.839). A key criticism of the activity system (Martin & Peim, 2009) is the limitation of the system to deal with power

relations and transformation at the macro level, when it is a micro level system. In the same way that some of the micro level relationships are not made explicit and therefore may not be dealt with, so the invisibility of power issues, limit the transformational power of the activity system, which creates a dissonance, given the Marxist influenced origins of Cultural Historical Activity System from which it draws its roots (Avis, 2009). Nevertheless, it is valuable for this study because of its ability to foreground, otherwise hidden issues; to present multiple perspectives for consideration and to look at the evolution of relationships over time.

This chapter has reviewed the current empirical research that addresses digital literacy. What has become apparent is that a nuanced approach to the issue of digital literacy is required to yield the depth and detail needed to understand this complex subject. The literature review has explored the problematic issue of a definition of digital literacy: definitions making reference to specific technology soon become obsolete; definitions focussing solely on skills and or competencies can result in the promotion of a technological determinism agenda, and overlook the importance of critiquing texts from a socio-cultural and historical perspective.

In one sense it is reasonable to argue that in some aspects, students can be akin to a digital native; being digitally literate in social media and gaming skills; yet, there is evidence that they are lacking in other digital literacy skills, for example, the ability to critique information, in whatever form, found on the internet. From the existing empirical evidence and the definitions of digital literacy, it becomes apparent young people may not be all round 'digital natives'. Research is still needed to investigate this claim and the experiences of students and teachers. The current research seeks to contribute to new knowledge in this area and the next chapter will set out the methodology used to achieve this.

Chapter Three - Methodology

In this chapter, the research strategy will be discussed and the rationale for choosing it as the best fit for this research will be offered. The data collection methods, data analysis framework, as well as ethical considerations and limitations will be detailed.

3.1 Research Paradigm

Action research is, according to O'Hanlon (2003, p.34) about changing something in the immediate environment and the researcher being a catalyst for bringing about that change. I wanted to effect a change in my environment: the class room, the college; so that the students would benefit. Working collaboratively was an important part of that process too so I could share and discuss my findings with other teachers, including the team of learning technologists. As the researcher, the cycles with their reflective element and opportunity for collaboration, mean innovations have credibility and are 'based on a rigorous evidential trail of data and research' (Cohen et al., 2013, p.344).

Action research is a philosophy, as well as a methodology, belonging to the interpretivist paradigm, which 'is informed by a concern to understand…the fundamental nature of the social world at the subjective level of experience' (Burrell & Morgan, 1979, p.28). Being able to understand the student experience and the teacher experience in this study was crucial for identifying a relevant intervention at classroom and college level. According to Cohen et al. (2013, p.18), researchers in this paradigm 'begin with individuals, and set out to understand their interpretations of the world around them'. As the teacher in the classroom I wanted to explore the issue of digital literacy starting from the students' perspective. Being aware of my own epistemological approach meant I understood why I was drawn to a research paradigm and strategy that would enable me to consider multiple perspectives. The research question was similarly influenced by my ontological

and epistemological approach, even though it might appear to the observer that the question was solely chosen due to classroom or workplace issues. This is true in as much as all researchers are likely to be more drawn to one choice over another as a result of their personal ontology and epistemological approach, which the diagram below (Fig.3.1) illustrates.

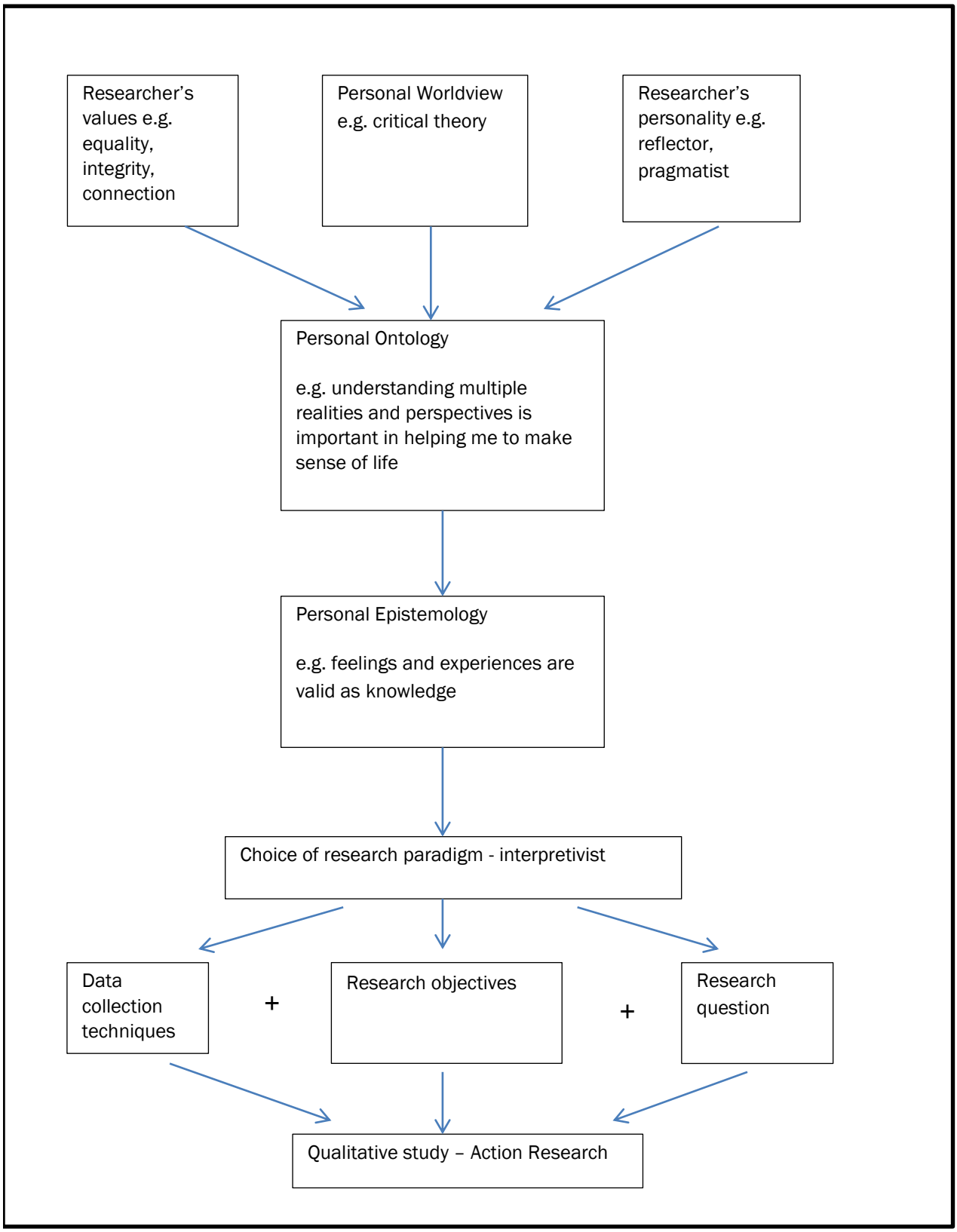


FIGURE 3.1 Researcher's influence on the research design adapted from Prescott (2009, p.26)

3.2 Research Strategy

The ontological and epistemological influences on the research paradigm have been briefly touched on above and go part of the way to explaining why action research was chosen as the research strategy. Additionally, action research, as 'a powerful tool for change and improvement at the local level' (Cohen et al., 2013, p.344) meant there was an opportunity to carry out research that would have change built within the cycles of it and not just as an end result or research recommendation. Action research has gained traction in education as a valid means for 'teachers to investigate those aspects of their practice that they want to improve and develop' (Altrichter et al., 1993, p.5).

In my current role I work as part of a team of advanced practitioners who regularly collaborate on joint projects, investigating learning technologies and teaching. For the current research, I was keen to continue this collaboration for the extra viewpoints my colleagues would bring, 'a form of collective self-reflective inquiry undertaken by participants in social situations (Kemmis & McTaggart, 1988, p.5). For the researcher; having colleagues to offer insights and critical feedback, is invaluable as a phase in this process of critical examination that Kemmis and McTaggart (1988) refer to. According to Cohen et al. (2013, p.349) there are different schools of thought regarding action research. Those who view it as a reflective practice, for example, Stenhouse (1975, p.142) who argued 'curriculum research and development ought to belong to the teacher'. Or those who see it as a political, participatory and emancipatory practice, where it has evolved from disadvantaged and marginalised groups, in the tradition of Freire (2000). O'Hanlon's (2003, p.27) argument that 'every classroom issue has a political dimension', forms a bridge between these different schools of thought.

Action research has the potential to bring about changes in an organisation; which is a serious consideration for the researcher that needs to be taken into account when selecting a research strategy. O'Hanlon (2003, p.25) lucidly states the case for why

action research can be a political activity whereby it ‘problematizes the values of the institution by challenging and questioning its practices in the institutional context, which can pose a threat to them’. Whilst this is an important consideration, the desire to deal with a problem of significance to a teacher in the classroom, with a wider organisational significance, is what determined action research as the most suitable approach and the best fit for this study.

The research inquiry with its focus on wanting to find out what student and teacher understandings of digital literacy are, required a strategy and methodology that would provide maximum flexibility in data collection methods, allow for the learning to be incorporated into subsequent cycles and permit collaboration with teaching colleagues. Action research offered the best method for blending action and reflection, with the hope interventions would lead to a positive change in my classroom and the college (and perhaps across the other colleges too). Therefore, cross college collaboration with other teaching colleagues who would be able to give their critical friend feedback at different cycles in the process was built into the design.

There are distinct phases in action research which form part of a cycle and the iterative nature of the research means that more than one cycle of the research is likely to be carried out, as can be seen in the diagram below (Figure 3.2) of the three cycles of action research that were carried out in this study.

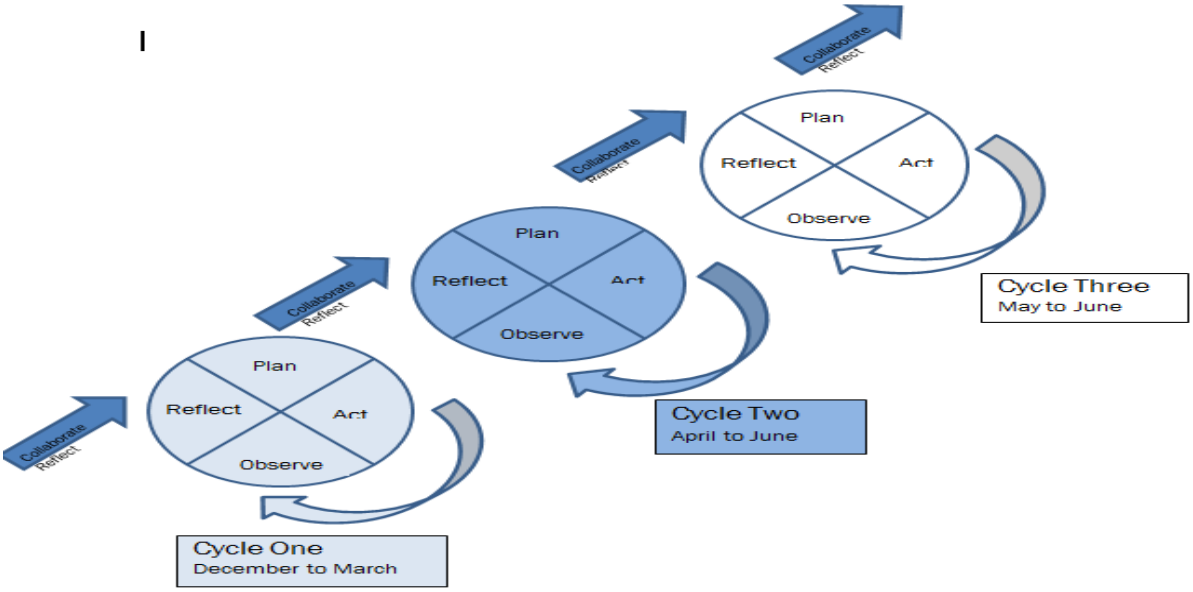


Figure 3.2 Action Research Cycles (adapted from Costello, 2003, p.7)

Action research cycles lead to change and within the research, from one cycle to the next this can influence the research questions. This study initially considered three research questions:

1. How do students define digital literacy?
2. How do teachers define digital literacy?
3. Where are the gaps in support for students and teachers?

However, the questions developed and changed as the research progressed and the topic became clearer, so that after the first cycle the questions became:

1. How do students conceptualise digital literacy
2. What do students think teachers should know about digital literacy?
3. How can teachers help students with their digital literacy?
4. What are the gaps in support for students and teachers?

This change in questions aided the study in meeting the aim of the research and the data collection.

3.3 Data Collection

This study had three cycles during which data was collected and the table below (Table 3.1) provides details of the timeline and data collection method for each cycle.

Table 3.1 Data Collection Schedule

Research Question	Timeline	Action Research Cycle	Data Collection Method	No. of participants
How do students define digital literacy?	December to March	Cycle One: students defining their understanding of digital literacy by providing examples of how they use it; rating their digital literacy skills and abilities using an online quiz	Three Learning Journals (online via student created website) Online quiz	(Group 1)13 students
How do students conceptualise digital literacy? Where are the gaps in support for students and teachers? What do teachers need to know about digital literacy? How can teachers help students with their digital literacy?	April to June	Cycle Two: Students using other students' definitions of digital literacy and examples, to write talk about what they think they need to know about digital literacy. Students identifying what teachers need to know about digital literacy and how they can help students to improve their digital literacy	Two Learning Journals, plus two augmented reality posters using Aurasma app.	(Group 2) 11 students
Where are the gaps in support for students and teachers?	May to June	Cycle Three: Teacher skills audit to identify which technology teachers feel confident using in the college. Teachers asked in survey to identify where they would like more training.	Online survey Feedback	36 teachers 9 teachers

		Focus group of teachers giving feedback on student comments	sheet	

Another important consideration in this research was the different methods needed for collecting the data that took into account the various access issues involved with participants who worked part time and across different geographical locations. Action research offers flexibility in how and what type of data is gathered, both qualitative and quantitative.

3.3.1 Cycle One December to March

This research set out to identify and map the digital literacy skills of students and teachers at the college. This was the problem/issue requiring an intervention. The first cycle dealt with the initial research question: How do students define digital literacy? In December, at a teachers' conference, a group of teaching colleagues met with me to discuss the issue of getting students to define the term digital literacy initially. It was seen as being potentially problematic. The average teenager is not likely to be familiar with the term, as is true, for a significant proportion of the adult population. Therefore, the starting point itself proved problematic, especially as the international students at the college sometimes come from backgrounds were there can be limited access to digital technology. Additionally, they were being asked to articulate their thoughts about a concept which they needed to understand in English, even though they may not have come across the term in their first language.

As a result of the teacher discussion, an alternative approach was considered and decided upon: to provide a short definition of digital literacy and then to ask students some structured questions designed to help them understand the term and to articulate their conceptualisation of what it is by asking them to provide examples of how they

demonstrate it in their everyday lives. They were asked to do this by completing a learning journal for each brief and the first group of students completed three learning journals (see Appendix C). Altrichter et al. (1993, p.6) suggest that 'methods are tailored to what is achievable without overly disrupting practice' and I decided to use online learning journals. I had used online learning journals with students in Part 2 of the MLT and had found that this worked well as a method of engaging students. This supports Hsu and Wang's (2010, p.71) assertion 'With greater flexibility, blogging tools offer a richer learning environment than traditional course-management systems'. Anecdotally, from my time as a CIT teacher, I have found that the majority of students struggle with the concept of reflection and they need support to understand this concept and practice it. I have found digital learning journals to be an effective tool in helping students to articulate their thoughts and get them to practice being reflective through helping them with Socratic questioning. The students come to the college to prepare for university and part of that preparation includes developing their evaluative, analytical and reflective skills. The learning journals are one way to scaffold student learning (Hughes, 2011), to move from what Masterman and Shuyska (2011, p.338) refer to as 'surface learning' to 'deep learning (abstracting meaning in order to improve one's understanding of the real world)'.

The students were asked to complete three online learning journals, which were hosted on the website they had created in the lesson. Erstad (2012, p.25) suggests 'digital media provide new spaces…for communication…and networking' and I wanted students to feel encouraged to make the most of this space to communicate and network for learning. Hence, they used a drag and drop website editor (Weebly) to create a website of three pages, one of which was created using the blog feature. All the websites were set up using teacher generated student accounts which meant that they were password protected. Nevertheless, students were asked to be mindful of e-safety issues, for example, not putting mobile telephone numbers or addresses on their website. The

intervention would be judged as successful if students were able to understand and complete each task with minimal teacher support and were able to answer all the questions in each brief. See Appendix C for examples of the learning journal briefs. The students were shown the learning journal briefs in the lesson via the interactive white board and the Moodle based VLE, where I had created a course for the class. The students were given a week to complete each learning journal task, after which I provided written feedback for them on the VLE course before they commenced the next learning journal.

Before the deadline of the first learning journal, there were three students who emailed to say that they were having problems understanding what they had to do. One student had technical difficulties publishing their learning journal. For the second learning journal task, six students asked for more information about what visual evidence to provide. At this point I decided to use examples from the other students in the class to demonstrate the type of visual evidence needed. With the third learning journal students were asked to complete an online digital quiz created by the University of Exeter (2015). The online quiz on digital scholarship was not used predominantly as a statistical analysis tool but as another data source to add to the 'rich rigor' Tracy (2010, p.841) argues is vital for qualitative research.

The students as a group were able to complete the tasks with help but some students needed a lot of support and possibly part of this could be attributed to the subject matter not being presented in the most easily understandable form. Altrichter et al. (1993, p.7) acknowledge 'it is not expected that new action strategies will solve a problem immediately' and that held true for this initial intervention, which did not fully answer the question: how do students conceptualise digital literacy completely but it did generate useful visual material and self-assessments that were then used successfully in the second action research cycle.

3.3.2 Cycle Two: April to June

The second action research cycle was designed using the student generated images from cycle one as a resource for the next group of students. Empirical research argues that visual forms can provide 'uniquely relevant tools for engaging contemporary youth and for enabling them to share their points of view' (Marquez-Zenkov et al., 2007, p.404). These students were asked to look at student generated images of the different ways in which they used their digital literacy skills and to read two student examples of how they rated their own digital literacy skills. Students were then asked to answer the question: what do I need to know or do to be digitally literate? Then they had to write a learning journal entry, film themselves talking about the topic and create an augmented reality poster with the footage, using the Aurasma app. They were given a chance to practice and problem-shoot using the app in class, to create a practise poster. Two students had technical difficulties selecting a trigger image that was complex enough to work with the overlay on their poster.

Next the students were asked to complete a second learning journal. For this task they were required to interview other students to ask them two questions: what do teachers need to know about digital literacy? How can teachers help students to improve their digital literacy? The students had to film at least one student answering these questions and then turn that footage into an augmented reality poster. They also had to produce a written learning journal entry with their own thoughts on these two questions. They had to upload their augmented reality poster to their learning journal page on their website, with their Aurasma user name. Matthews and Sunderland (2013) attest to the power of digital methods in helping individual's voices to be heard and the positive effect on digital literacy in the classroom. (See Appendix D for examples of augmented reality posters produced).

3.3.3 Cycle Three: May to June

A Survey Monkey questionnaire was created in collaboration with the Learning Technology Manager. An online survey method was chosen because it was more accessible for gathering data from part time teachers. Online surveys have grown in popularity (Wolfe et al., 2014) due to the accessibility they offer, with Survey Monkey being a convenient software that is low cost and collates easily downloaded data (Bruce & Core, 2011; Harrison et al., 2010). Several drafts of the survey were trialled using volunteer teachers to assess how relevant the questions were. All the teachers at the college (40 teachers) were sent the questionnaire called a Teacher Skills Audit (Appendix J) and asked to self-assess. They were asked to identify any training that they wanted/needed. The final number completing the audit was 34, which was a good response rate.

A selection of anonymised student comments from the final student learning journal was shown to a focus group of teachers. They were asked to give their feedback on a form (Appendix I). Focus groups have been widely used in research as an effective way of gathering rich, qualitative data, from a group of individuals with a particular interest (Morgan 1996; Nelson et al., 2013; Norris et al., 2012). In the current study the focus group helped to add a valuable extra source of data, as a method of triangulation, providing what Tracey (2010, p.841) refers to as '…a rich complexity of abundance'.

3.3.4 Research Participants

Sixty nine participants took part in the study: twenty four students and forty five teachers. The students were from the college where I work. The teachers who took part in the Teacher Skills Audit were from the college where I worked and the teachers who took part in the focus group came from colleges and study centres across the wider organisation.

A combination of convenience and purposeful sampling (Creswell, 2007) was employed to justify the selection for using students from my classes in two terms Spring Term (January to March) and Summer Term (April to June). They were the right age to be considered 'digital natives'; they came from a wide range of countries, had different levels of English language ability and exposure to digital devices: all of which made them an ideal sample for the research. The demographic profile of the students included one group of 11 students who were Singaporean (4 males and 7 females), and one group of 13 students (4 females and 9 males) who came from Malaysia, Vietnam, China, Pakistan. The ages of the students ranged from 18 years to 23 years of age. Teachers in this study came from: UK, Europe, Indian sub-continent, China, East Asia and were aged from 25 years upwards. The 36 teachers who took part in the skills audit were from the college where I work (21 Female and 15 Male). The 9 teachers (5 female and 4 male) for the focus group were from other colleges and study centres in the organisation and they had volunteered as a result of attending a presentation on this research that I had delivered to a group of teachers and managers in June.

3.4 Data Analysis Framework

The data analysis framework suggested by Stringer (2007, p.101) of 'categorizing and coding' and 'identifying themes' was used with the student data. In keeping with Stringer's (2007, pp.106-107) recommendation of 'enriching the analysis' with the aim to produce a 'holistic analysis that incorporates all factors likely to have an impact on achieving an effective solution to the problem investigated', the teacher data was similarly analysed and incorporated. Furthermore, Stringer (2007, p.107) suggests that 'frameworks of analysis' help those who have a stake in the research to 'delve beneath the surface of events'. The data analysis framework and strategy that was used in the

Part 2 MLT action research project was adapted and employed here and is shown below in figure 3.3.

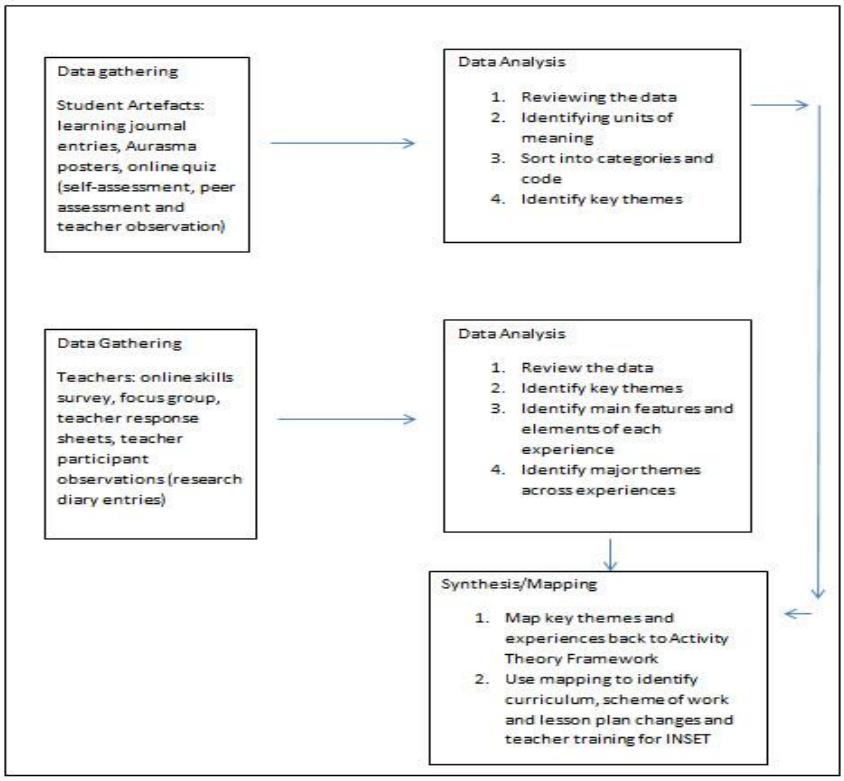


Figure 3.3 Data Analysis Framework. Adapted from MLT Part 2 Pilot Project

3.5 Reflexivity

The researcher needs to be reflexive and understand why their personal values and perspectives would influence their decision to choose this strategy. Cohen et al. (2013, p.359) point to a need for the researcher to have '…a self-conscious awareness of the effects that the participants-as-practitioners-and-researchers are having on the research process'. Part of the researcher's efforts to ensure reflexivity involve being transparent (Tracy, 2010) and in the current research this was done by using a research journal/reflective diary and peer review groups, where I was asked questions about my

decisions and choices with regard to different cycles in the research. I agree with Willig (2009, p.20) that ethical issues do not start and finish at the proposal stage but are more likely to 'surface throughout the research process'. By the researcher taking responsibility for being open about their thought processes, reflexivity can help to ensure that ethical issues are kept at the forefront. Equally, the power issues between the researcher and the research respondents can have ethical implications that peer review can throw a spotlight on. Etherington (2004, p.37) argues that 'reflexivity adds validity and rigour in research by providing information about the contexts in which data are located'. My research supervisor was a valuable sounding board in this research and through her Socratic questioning, I was able to arrive at key decisions, reject ideas that were too ambitious and formulate new questions.

In this research it is relevant to be reflexive about the roles I occupy in my workplace. as a teacher of ICT and Politics, a programme manager for pre-university access courses and during the lifespan of this research project, I was an acting Academic Director for the Business and Law programmes; a student at university and an Advanced Practitioner, training and mentoring teachers to use learning technologies in the college. These different roles bring with them a range of tensions but also the advantage of being able to reflect from very different perspectives. Yet, I am mindful of the caution made by Selwyn (2012, p.82) to academic researchers of 'disconnecting any analysis of young people, education and digital technologies from their own personal experience of digital technology'.

As a researcher and teacher working with international students, I think it is important to acknowledge I have a Euro-centric, Western perspective which will have had an influence in this research. The terminology of the digital age is dominated by the globalisation of the English language and as has been shown in the literature review, the intertextuality (Fairclough, 1992) of language means that it is not neutral.

3.6 Validity

The term ‘member reflections’ is used by Tracy (2010, p.844) to capture the variety of ways that participants, and in this study, the colleagues who I collaborated with, provide checking, validity and verification of the data. The chance to ‘enhance the credibility of the emerging analysis’ (Tracy, 2010, p.844) through input from colleagues was incorporated into each cycle (Teachers’ conference in December, Poster conference in June, e-learning meeting in June). McKay and Marshall (2001, p.49) highlight criticisms of action research, including: the difficulty in attributing evidence to the success of the intervention; lack of scientific rigour, lack of validity and generalisability of findings. The issues of scientific rigour, validity and generalisability are criticisms not exclusive to action research but are part of the quantitative versus qualitative debate that was highly topical at the time McKay and Marshall were writing and part of the ongoing scrutiny of all qualitative research. Cohen et al. (2013, p.179), in addressing the issue of reliability in all types of research, respond thus ‘Threats to validity and reliability can never be erased completely: rather the effects of these threats can be attenuated by attention to validity and reliability throughout a piece of research’. Using a reflective diary/research journal as extra methods of providing some of the rich data that can help to increase reflexivity and help increase validity and are part of what Tracey (2010, p.844) refers to as ‘crystallization…to open up a more complex and in depth…understanding of the issue’. These strategies demonstrated how I questioned my assumptions and how I arrived at various decisions in the research process.

3.7 Collaboration

Collaborating with a team of learning technologists and teachers played a key role in the methodology of this research. The teachers provided peer review: an extra method whereby the researcher is asked ‘hard questions about methods, meanings and

interpretations' (Creswell, 2007, p.208). In the initial stages of designing the research proposal, I had an ongoing dialogue with the Learning Technologies Manager about which aspects of learning technologies a teacher skills audit should focus on. We designed together, the Survey Monkey questionnaire that formed the skills audit, evaluating and assessing how each question might or might not elicit the information needed as a whole to give the overview needed of teacher skills. I worked on developing augmented reality posters with two learning technologists. We spent a day together, firstly creating posters, then brain storming how they could be used in our lessons, in the college and across the organisation. The idea to use it in this research with the students was one of my action points from that day. Having shown students how it could be created, they then developed their own posters (see Appendix D). I was able to present my initial research to the whole learning technology team and a group of senior managers in the organisation and in turn, they were able to give me critical feedback, insights and suggestions.

3.8 Ethical Issues

Cohen et al. (2013, p.373) warn that the virtual world has its own particular issues the researcher needs to consider to ensure that participants are not exploited or harmed, for example, 'vulnerability, individual risk and informed consent'. The University of Oxford has strict ethical guidelines that researchers have to adhere to and therefore this research was required to undergo rigorous process before any data was gathered. An outline of the research proposal was required to be submitted to the University's ethical research committee (CUREC – See Appendix A). The outline included confirmation of having read another set of professional guidelines such as BERA (British Educational Research Association) and AOIR (Association of Internet Research). A letter asking for consent to carry out the research was first sent to CUREC for approval before being sent

to the principal of the college (See Appendix B). The research participants were informed of the research and of their right to not participate and to withdraw at any time; that their information would be held securely, in line with the Data Protection Act (Legislation.Gov.UK, 2015); and their anonymity would be guaranteed.

There can be ethical issues with regard to access in research (Creswell, 2007; Stringer, 2007; Altrichter et al., 1993), especially where the researcher is part of the research process, as this could lead to a conflict of interest. Cohen et al. (2013, p.172) suggest educational research by its very nature can be sensitive on several levels: vulnerability of students; research respondents wanting to talk off the record; unexpected disclosures that may pose a dilemma for the researcher. One learning journal brief required students to give their opinions on teachers and I considered it appropriate to ask students to not include the names of any teachers in the text and videos that they produced.

3.9 Limitations of Research Design

Action research is not without its critics, who point to its limitations, in particular that it is not methodologically rigorous and makes claims to bring about empowerment and transformation that are unrealistic (McTaggart, 1994, p.326). Equally, Cohen et al. (2013, p.361) ask if action research is 'an optimistic way of ensuring that research impacts on practice for improvement, or whether it is a recessive hybrid'? As McTaggart (1994, p.325) contends, to talk of empowerment is likely to be an exaggeration that should be avoided but action research can rightly claim to 'enhance practice, confidence, knowledgeability and influence in [the]…workplace'. In the current research, using Activity Theory as an additional analytical lens helped to 'identify findings that encapsulate the entirety of the observed data and can avoid isolating it from the real-world context to which it was observed' (Yamagat-Lynch, 2010, p.30). This has the

advantage of aiding the researcher to observe different perspectives and consider the complexity of relationships within the activity triangle, so providing multiple sources of data: what Tracy (2010, p.841) refers to as a 'rich complexity of abundance'. This method of providing different data collection methods and sources is known as triangulation: which Cohen et al. (2013, p.197) argue 'does not necessarily increase validity, reduce bias or bring objectivity to the research'. However, every research has its limitations and a critical awareness of them, I believe, helps the researcher to reduce bias. Equally, the issue of validity has been addressed above.

In the teacher focus group, a dilemma arose regarding whether to collect teacher feedback electronically, record then transcribe, or to collect hard copy responses. In the end because this study and the topic of digital literacy were deemed by the meeting to have such timely significance on the day, time ran out to ask the teachers to fill out the sheets and they were asked to do this electronically and return by email. Fortuitously, this resulted in rich data being generated because it allowed time for reflection (see Appendix I).

In addition, the different English language abilities of students in the study meant some of the activities had to be altered in order to present the concepts more simply. Some of the students in Group 1, had lower English levels than in Group 2: the lowest IELTS (International English Language Testing System) score in Group 1, was 5.5, compared with the highest score in the Group 2, of 8.5. One consequence for the study was students in Group 2 generated more data and were able to articulate thoughts more clearly. This was an issue to deal with in the data analysis: making sure all voices were represented. In Group 1, where the English language level was lower, there were multiple instances in the first cycle of plagiarism and students were encouraged and given help to develop their own voice. These issues reflect the reality of the college and many other educational settings and are therefore valuable when thinking about digital literacy.

In this chapter the importance of reflexivity on the whole research process has been highlighted: from initial conceptualisation, through the formulating of the research questions, the choice of research strategy, methodology, to data collection and analysis because the researcher's values, conscious or unconscious bias, are influential at every stage. As McLeod (2001, pp.54-55) avows 'To produce good work, qualitative researchers need to reflect on *how* they see and understand, to reflect on the process of knowing itself' [italics in original].

Chapter Four - Findings and Discussion: Students and Digital Literacy

In aiming to identify the digital literacy skills of students and teachers in an international college, this first chapter of the findings and discussion deals exclusively with the first research question

1. How do students conceptualise digital literacy?

The data is drawn from cycles one and two because two different groups of students were involved in eliciting understandings of this complex term. The first group produced a set of visual resources that the second group then used as a starting point to help prompt their thinking about digital literacy. Table 4.1, below, identifies which students were in each group:

Table 4.1: Student Groups (names changed to protect anonymity)

Group 1 – Cycle One	**Group 2 – Cycle Two**
Sylva, Ruby, Nicole, Nicholas, Joseph, Amos, Feng, Eric, Justin, Alicia, Andre, Cai, Jay	Michelle, Yi Ling, Kimberly, Alexis, Swami, Mu, Lee, Lex, Amelia, Zeth, Wan

The quotes from students that appear in this study are ones that best reflect the analysis of the data and the key themes that emerged will be presented in the following order

1. Digital Natives
2. Knowledge and Skills
3. E-safety
4. Metaphors of digital life

4.1 Digital Natives

There are quotes from two students, representing polarised opinions, which offer a fascinating insight into how digital literacy is being conceptualised. The first student, Mu,

remarks “As digital natives, we are able to grasp the concepts of digital media, the technical skills required, and social networking functions almost intuitively.” Mu describes himself as a ‘digital native’ based on his technical skills and ability to use ‘intuitively’ social networks. The use of the word ‘intuitive’ is significant, as the student uses this adverb to convey the impression that digital literacy does not require any effort or consciousness. “All in all, while the term “being digitally literate” may sound daunting, it is in actual fact very intuitive.”(Mu) This student’s comments reflect the views of Prensky (2001), policy makers (European Commission, 2015; OECD, 2013) and Sam (2012, p.83) ‘Most students and young teachers are digital natives – those fluent and comfortable with the digital technology of computers and the internet’. Whilst all the students in this study gave examples of the way in which they were ‘fluent’ in different aspects of digital life, this does not necessarily extrapolate to them being digitally literate in all aspects. As Crook (2012, p.65) surmises, ‘it is unsatisfactory to simply declare that ‘the digital natives are not *that* native’ [italics in original]. Yet, if the notion of being a digital native is part of being digitally literate, then there is empirical evidence to suggest that it may not be completely unsatisfactory (Helsper & Eynon, 2010). This is a good point at which to consider the second student quote, from Swami and the reasons that he gives for why he thinks people’s claims to be digitally literate or digital natives; are not based in fact:

> I do not subscribe to the idea of the majority of people being digitally literate. People simply know how to interact with the digital interface, yet most of them have almost no understanding of the interface itself, much less on how to process it and reproduce it. (Swami)

Swami, with three programming languages, is likely to be more digitally literate and equipped with above average technical skills than most young people and yet he says he does not believe he is digitally literate because he only understands a small part of what the digital world comprises and has “no means or methods to comprehend it”. The agentic relationship between this student and the digital world seems unequal and appears to echo Facer’s (2012, p.98) assertion that young people’s voices are ‘invisible

in the dominant contemporary discourses that link education with debates about future socio-technical change'. There would appear to be a space here for the curriculum to address this issue at local level to help young people to develop their voice and help them to identify and critique the dominant discourses (Facer, 2012; Fairclough, 1999). Alongside this, an awareness of the discourse that makes teachers solely responsible for fixing all the inequalities associated with digital technology (Voithofer & Foley, 2007) would seem apt too.

From the data provided in the online quiz (Appendix H) it became apparent that on occasion there was a difference between what students said in their conceptualisation of digital literacy and how they rated themselves when using pre-defined terms. This could be due to comprehension but equally, it could indicate an avenue for further exploration. One such student, Nicholas, had a low self-rating on 'information junkie' and 'life planner', which raised the issue of whether this indicated an area for development that the teacher, personal tutor or the curriculum could support through an individual learning plan. Three students (Eric, Sylva and Nicole) gave themselves a low self-rating in 'learner networker' category. This could be explored further in the classroom where the teacher could incorporate activities for student collaboration online (perhaps using VLE, or social media for increased student-engaging) giving students a chance to practice, discuss positives, dislikes/fears, evaluate and analyse experience collectively. This links to Moll and Greenberg's (1990, p.344) suggestion that educational establishments need to explore how 'funds of knowledge ' can be used in the classroom, thereby 'developing social networks that connect classrooms to outside resources by mobilizing funds of knowledge'.

4.2 Knowledge and Skills

4.2.1 Knowledge

This particular theme encompasses student thoughts about information, critical thinking, as well as creativity. There is much debate about what knowledge young people will need, to be able 'to cope with the demands of today's knowledge society' (Pow & Fu, 2012, p.288), therefore it is insightful to be able to examine how students experience this discourse through their reflections on the issue of digital literacy.

> My quote is 'Practice makes perfect'; the more knowledge you study, the more benefits and achievements you get. (Jay)
>
> Myself and other youth included, must always seek to better ourselves and be the masters of the digital domain. (Lee)

These two quotes above typify the attitude towards knowledge from the two groups of students. In the quote from Jay, knowledge is seen as a commodity, the more of which is consumed, the more advantages will be accrued on the learner. It is not clear here, what type of benefits and achievements that the student is referring to – whether they might be material or non-material. Young (2009, p.15) argues that schools (and colleges) are places where young people can be exposed to a form of knowledge that they might not be likely to encounter at home 'context-independent…powerful knowledge'. The vital issue with this type of knowledge is students most likely cannot learn this type of knowledge outside of an educational setting, although, one could argue that with the advent of MOOCS (Massive Open Online Courses) and the like, specialist knowledge is available to all. Nevertheless, 'powerful knowledge' not only provides 'reliable explanations or new ways of thinking about the world' but if we accept that 'it is those with more power in society who have access to certain kinds of knowledge' (Young, 2009, pp.13-14), then through acquiring it, students are better positioned to access social and economic opportunities. Moreover, by being able to access this type of specialist knowledge they are more likely to be able to understand the discourses

associated with this type of knowledge, be better informed and feel more confident to contribute as digital citizens.

These two students appear to be expressing their acknowledgement of the importance of cultural capital and social capital, which Bourdieu (1986) theorised were passed on from parents to children and the possession of which, because they are not universal in nature, gives anyone who has it, an advantage. I offer this argument about the students and connect it to Bourdieu's theory because the vast majority of the students at the college come from affluent backgrounds and have parents who occupy high status jobs and elite positions in their society. Erel (2010, p.643) describes cultural capital, as formal education and 'informal education, transmitted through the family, political parties, cultural groups…'. Whilst it is not my intention to suggest homogeneity of cultural capital here by talking about human or ethnic capital (Erel, 2010), I do contend that students at the college tend to arrive at the college with a keen understanding of how specialist knowledge and education can convey economic, social and cultural advantages. It is one of the reasons that they choose to be educated in the UK educational system. Part of their achievement in gaining powerful knowledge is to be seen as smarter than those who do not possess it. Hatt (2012, p.439) describes 'smartness' as a 'social positioning tool…utilized by some not only to determine the social identities of other but to make sense of their own identity'. Smartness in this context is a form of cultural capital and there is an advantage to the group or groups who define it, suggests Hatt (2012, pp.455-456) 'Defining smartness is a tool for maintaining power and limiting who has access to power'. When students refer to being 'masters of the digital domain' (Lee) and are keen to 'practice', they understand that in the digital world and the knowledge economy, these are important determining factors between who has power and who does not. The students bring with them from their own families, communities and cultures, their own 'funds of knowledge' that Moll and Greenberg (1990, p.323) define as 'specific knowledge of strategic importance' that are 'manifested through events or activities'

(p.326). Their own 'funds of knowledge' are likely to have a mediating influence on how they access learning in the classroom and this extends to what they select as important when considering the issue of digital literacy and their future.

4.2.2 Skills

Several students connected digital literacy with their economic future and it is apposite to look at the wider context when studying their comments:

> In simple terms, being digitally literate makes one highly relevant in the job market. Employers often look out for potential employees who are digitally literate, and thus may be able to contribute to the company positively. (Mu)
>
> …competency in basic programs such as Microsoft Word, Microsoft PowerPoint and Microsoft Excel, all of which tend to be relevant in one's career, either as a student or as a professional. (Kimberly)
>
> …the importance of digital literacy in our current modern era will only be increasing and eventually, there might even be a possibility that it will be regarded as a pre-requisite of any occupation. (Alexis)
>
> …digital literacy has become increasingly important no matter what age group you are and no matter what you are doing especially since it increases your employability. (Lex)

The European Commission's 2020 Digital Agenda (2015) asserts that 90% of jobs in the not too distant future will entail digital skills of some kind. Likewise, an OECD report (Reynolds & Stryszowski, 2014, p.5) insists that those '…people, as well as governments, who prepare and position themselves with the right skills, will be at an advantage in the global economy'. The comments from students in the study reflect their awareness of this issue, whether it is as a repetition of rhetoric, as the response from Alexi appears to be ("regarded as a pre-requisite of any occupation"); or a verbalisation of cultural capital and conformity, from Mu ("contribute to the company positively"). The issue of agency arises when examining the students' responses. It leads one to wonder if these students feel a genuine sense of agency with regard to what they want for themselves in their future lives or if their comments ("relevant in one's career" Kimberly, "increases your employability" Lex), are verbal manifestations of enculturation and

conformity to the discourse of technological determinism (Livingstone, 2012; Facer, 2012).

When Hatt (2012, p.455) talks of 'limited agency', it is this sense of students' desires and voices being subsumed. Being digitally literate can be viewed in the same way as 'smartness' was viewed in the classroom that Hatt (2012, p.452) observed; not as an 'innocent, benign concept…but a concept used to teach them their status', whether this be in college, at university, in the workplace and beyond. At this level of analysis, digital literacy can be a tool for the diffusion of cultural values, ideology and dominant discourses and one that the teacher needs to be aware of (Alexander, 2008, p.92). Therefore, the findings from this study illustrate that there is a need for teachers to model reflexivity for students, alongside helping them develop their own voice and sense of agency.

4.3 E-safety

It was notable that eleven of the students taking part in the research specifically talked about e-safety related issues. In one group, eight out of eleven students in the group, mentioned e-safety when talking about digital literacy. Behaving appropriately online was raised by three students, who directly linked it to definitions of digital literacy.

> Adhering to behavioural etiquette. (Joseph)
>
> …an ability to engage in online communities and social networks while adhering to behavioral protocols. (Nicole)
>
> A digital literate person will also acknowledge ethical online behavior. Plagiarism and misappropriate use of the Internet to disseminate abusive content is not what 'tech-savvy' users will do. (Yi Ling)

Students who referred to behaviour online did so in the context of self-regulation. This is in contrast to the assertion from Camacho et al. (2012, p.3177) that the online world offers young people the opportunity to create identities 'without being constrained by the norms and behaviours that are desirable in the society to which they belong'. The

students in the current research, appear to be conforming to the same norms about behaviour in their offline and online worlds, which in contrast with Camacho et al., more closely aligns with the position from Zhao et al. (2008, p.1817) that 'the online world was not monolithic'. However, even though Zhao et al. (2008) argue that 'the association of conformity with the offline world and deviance with the online world is invalid', from their research there is evidence that online users construct their identity and moderate their behaviour according to whether they are in anonymous mode online or what they term as a 'nonymous environment' (p.1831). One student, Lex, associated being aware of the dangers online with 'creativity and imagination':

> I think that the most important thing to know about digital literacy would be that of e-safety…Cyber-bullying has also become a new problem that organisations on different platforms have to deal with. Once people have learnt about the dangers of using technology, creativity and imagination can then freely flow. (Lex)

In drawing attention to the issues of creativity, cyberbullying and e-safety, Lex appears to demonstrate a high level of awareness and agency in his online environment. However, some of the language that Lex uses, 'dangers in using technology', even when balanced with the talk of 'creativity' and 'imagination', suggest that he may have been influenced by the technological determinist discourse (Selwyn, 2012, p.85). Cyberbullying is an issue that has caused an increase of 87% in young people contacting ChildLine (2013) in 2012-2013 alone. There are potential implications for school and college leaders in failing to address this issue even if there is not yet a body of case law as there is in the USA (Hvidston et al., 2013). Helping students to understand the issues and having a clear policy for dealing with this behaviour are preventative measures that the college in this study has promoted but there is room for more provision within the curriculum. In particular, the need to maintain an ongoing dialogue with students about what constitutes cyberbullying (Patchin & Hinduja, 2015).

It is notable that Yi Ling was the only student to explicitly mention plagiarism and link it with ethical behaviour. Sharples et al. (2009, p.13) found in their research that

plagiarism was a significant issue in some schools. Students in the current research (from Group 1) were found to have plagiarised material in their learning journals. The college has an academic impropriety policy and the students were given a zero mark and a chance to re-do the work in the first instance. I think that plagiarism is an issue that the college needs to do more to address and this is in line with the findings of Sharples et al. (2009). I have previously written (Prescott, 2012) about the issue of plagiarism as I think scaffolding students to develop their authentic voice is part of a range of strategies needed for reducing instances of plagiarism and developing digital literacy.

For Wan, the appropriate online behaviour means taking responsibility for being courteous and tactful 'I believe digital literacy also includes having the proper behavior online'.(Wan). The issue of protecting oneself and personal information online by using the privacy settings was mentioned specifically by Wan. Acquisiti and Gross (2006, p.2) highlight the 'unprecedented phenomenon of information revelation' whereby online users disclose too much personal information and do not take enough precautions to protect their personal data, with the result that they can end up with their 'digital identity scattered all over cyberspace' (Camacho et al., 2012, p.3177). Lee raises the issue of personal information through the issue of sexting:

> Perhaps more worryingly, is the lack of adequate safeguards that youth undertake to protect ourselves whilst using such apps. For example, whilst selfies are fun to take, what if the photo was of a more sexual nature? Such content could easily find it's way onto social media, spreading before the unwitting victim is even aware. (Lee)

Notably, Lee does not use the term 'sexting'. Ringrose et al. (2012, p.6) contend that this may be indicative of 'a gap between adult discourse and young people's experiences'

In the college where I work, all students have to attend an e-safety workshop as part of their induction, in which the issue of sexting is covered and students are made aware of

the laws in the UK. In particular their attention is drawn to the potential consequences of having images with a sexual content on their mobile phones or other digital devices, of people under 18 years of age. One of the recommendations from Ringrose et al. (2012, p.55) is to use video to get the message across to young people rather than advice sheets or lists. In the college, the e-safety workshop uses videos which do seem to engage the students. The fact that only eleven out of twenty four students taking part in this research mentioned e-safety as part of digital literacy is a possible indication that more awareness-raising is needed throughout the year to keep this issue current in students' minds.

Several of the students mentioned the need to establish if a source of information on the internet is valid. One student, Alexis, referred to internet scams and internet fraud, whilst Yi Ling talked more specifically about critical evaluation and analysis and how it would help them in their academic work:

> When completing a school project, a digital literate student will recognize that Wikipedia is not a reliable source compared to academic journals. (Yi Ling)

In particular, this student addresses the issue of not using Wikipedia as a reliable source. The fact that Yi Ling is able to differentiate academic journals as being a valid source of information is significant. 85% of international students at university in Rushton and Lahlafi's (2013) study did not know what a peer reviewed journal is. The following quote from Joseph, is more typical of the response students give about Wikipedia or Google, according to the empirical research (Asher & Duke, 2011; Rushton & Lahlafi, 2013; Fawley & Krysak, 2012): 'I use wikipedia a lot and it's actually very informative. It is like an online library on everything and anything' (Joseph).

4.4 Metaphors of digital life – networking and communication

All twenty four students taking part in the research, talked about their online life and examining the language used by students to describe their thoughts and experiences in

the digital world offers an additional perspective of how they conceptualise digital literacy. Viewing language as 'semiotic mediators' (Hatt, 2012, p.447) and examining the metaphors, idioms and phrasal verbs that appear in the students' written accounts reveal not only how they are constructing language and meaning but how they are configuring their identity in the online world and being influenced by the online world.

> Technologies are not felt as separate or an adjunct to 'real life',
> but rather are intimately entangled in the making and unmaking
> of young people's everyday lives and relationships.(Ringrose et al., 2012, p.26)

The metaphors and descriptive language that the students use to describe their experience online are shown in the table (Table 4.2) below:

Table 4.2 Student metaphors

Technology as an aide	Comfort, , creativity, save time effort and money, from the comfort of our homes, everything done instantaneously, extremely fortunate, easy access, at our fingertips, convenience, always advancing and improving, space age devices, creativity, content creation, new, modern, quick access, better, myriad of resources, speed up
Connection	Everybody is connected, constantly on SNS, ephemeral, make friends, stay in touch, communicate efficiently, interacting, keeping informed, blogging, retweeting, updating my status, social networking, online communities
Ubiquitous technology	Seamless, everyday use, day to day, anywhere and everywhere, hard to avoid, unavoidable, part of day to day life, it is all around us, part of daily routine, virtual second home, indispensable, limitless
Technology as a danger	Beneath the surface, double edged sword, addicted, lose sight of reality, harmful side effects, over reliance, lack of privacy, get trapped, the dark side, cause problems, lack of communication, using too much, cyberbullying, internet fights, can be false, ambiguous, unreliable, use with caution, judge its credibility, use it safely, taking precautionary measures, digest and compare, misappropriate, mismanage, protecting identity, sieve out, form your own opinions, conduct oneself appropriately
Impact of technology	Massively relevant, highly relevant, profound effect, important part of my life, inevitable, requires contact, necessary, fast pace of society, extremely relevant,

	definitely important, great increases, transcend geographical borders
Relationship with technology	Fishes to water, digital natives, always using, no difficulty in understanding, dream about technology, able to learn quickly, use any digital device easily, enjoy, can't imagine life without, cannot imagine the world without, intuitive, not interested, more of a need to use not want to use, unavoidable, no difficulty in understanding, not very keen, more than competent, harnessing its benefits, masters of the digital domain, seek to better ourselves, interact with every day, very connected to it, contribute positively

The metaphors and analysis of the language students use to describe their experience refer to a close, almost symbiotic relationship, in which students are being shaped by the tools of the digital world and are in turn helping to shape their environment, their digital world: "I cannot imagine someone being digitally illiterate as technology is massively relevant in our daily lives." (Amelia)

In order to identify the digital literacy skills of students in the college, this chapter has explored student conceptualisations of digital literacy, drawing on data generated from the first two cycles of action research. Through the themes that emerged from the data analysis, what has become apparent is how influential the digital world is in the lives of these students.

Although students report on the benefits of the digital world, this research has found evidence that not all the students are enthusiastic about having to interact with technology continuously. For some students, traditional ways of learning still have their appeal:

> Becauce I prefer the traditional way of studying as I liked to writing the essay by hand rather than type it into computer and I like to reading a book printed by paper (Andre)

For other students digital literacy includes being aware of the 'dark side' (Lee) of the digital world, behaving appropriately and to appraise the information that they encounter.

Analysis of student conceptualisations of digital literacy reveals the 'dialectic interactions between people and the ways technologies shape and are shaped by human activity' (Crawford & Hasan, 2006, p.51).

The value of using Activity Theory as another analytical lens is that it can help to contextualise issues and foreground hidden ones. The following diagram (Figure 4.2) illustrates this by showing in the coloured boxes (Tools and Community) what students tend to focus on, for example, mobile phones, social media and networking. What becomes apparent from the findings is that, although students have awareness of other issues such as e-safety, they do not as a group tend to have an overview of the full range of issues that need to be considered when conceptualising digital literacy. This is where the curriculum and teachers can play a key role in helping them, to develop their understanding of the complex and multi-disciplinary nature of digital literacy and how, in order to be in a position to contribute to current and future debates about how it should evolve to benefit their lives and others, they need to be fully cognizant of what the term encompasses.

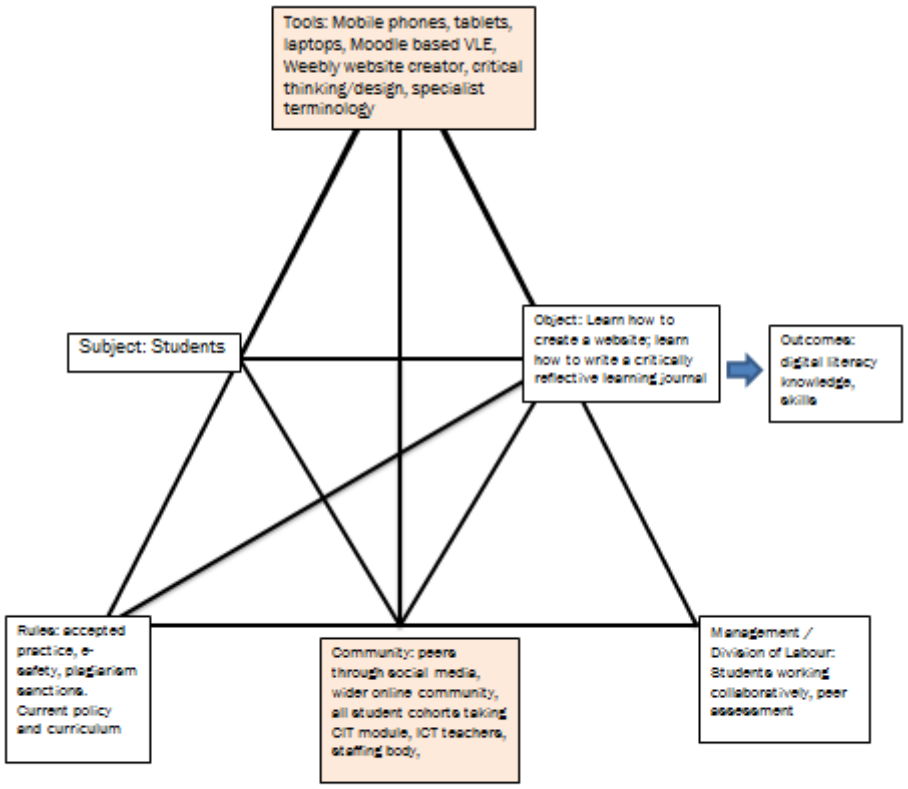


Figure 4.1: Activity System with a student focus adapted from Engestrom, 1994

In this chapter the research has identified areas in which the curriculum can support students further: helping to develop their understanding of the spectrum of digital literacy knowledge and skills needed for full inclusion in digital life; opportunities for supported online collaborative learning activities; ongoing e-safety discussions through PSHE lessons in small group discussions. In the next chapter, the findings and discussion will present both student and teacher generated data from cycles two and three that address the remaining research questions.

Chapter Five - Findings and Discussion: Teachers, Students and Digital Literacy

This chapter will examine the findings from the second and third cycles of the study which addressed the last three research questions:

- What do students think teachers should know about digital literacy?
- How can teachers help students with their digital literacy?
- What are the gaps in support for students and teachers?

This will be done by first analysing the results of the teacher skills audit then second, by proceeding to discuss the findings from both student and teacher generated data which will be presented in three tables. The data from students and teachers, gathered in cycles two and three, was drawn from:

1) Teacher Skills Audit
2) Student Learning Journal (Group 2): What do teachers need to know about digital literacy?
3) Student Learning Journal (Group 2): How can teachers help students with their digital literacy?
4) Teacher Focus Group: feedback on student comments on the above questions

5.1 Teacher Skills Audit

The teachers in this research were asked questions that related to specific areas of digital literacy in the college: the focus being on the learning technologies available to them in the classroom. Thirty six teachers responded and from the results (see Appendix J) it is apparent that the majority of teachers are confident and able to carry out basic functions on the IWBs (interactive white boards), such as turning it on and off (97% of respondents), using the IWB pens (86%) and basic file management to find, save and open lesson slides (81%). When asked if they could use the Smart Notebook lesson activity toolkit, which can be used on the IWB, only 33% of respondents indicated

they felt comfortable doing so. This suggests that this particular aspect of learning technology is being used in a fairly limited way in the classrooms and the more interactive functions that could be used with students are not being fully utilised.

From the skills audit, it becomes apparent that the college's VLE (Virtual Learning Environment) StudySmart is another learning technology that is being under-utilised by teachers. 50% of teachers can carry out basic functions such as updating their profile or uploading materials. Yet, less than a third of teachers feel comfortable to add an image (28%) and 44% of teachers were not able to embed a video or create a link to a website (42%). This indicates that the features of the VLE that could create an engaging and participatory environment are not being used effectively, leading to the VLE being employed largely as a 'resource bank' (Crook, p.70, 2012).

The plagiarism detection software (Turnitin) at the college was purchased as a resource to help students to prepare for university and to help them develop their own voice: an issue of particular pertinence to international students (Prescott, 2012). Nevertheless, only 31% of teachers responded that they felt comfortable to create a Turnitin assignment, or access (36%) and interpret (39%) the originality reports that show where material has been used from other sources without referencing. It should be acknowledged that this software is more useful in some subjects than others and could therefore account for part of the reason why more than 50% of the respondents did not know how to use Turnitin. On the other hand, the fact that only a small percentage of teachers are using the software ties in with access issues for students. In a previous study in this college , students identified that they wanted more opportunities to use Turnitin (Prescott, 2012) and in the classrooms where it was widely used, students valued the opportunity it gave them to become familiar with the software before they progressed to university.

Access opportunities such as these help students to build their cultural and social capital (Bourdieu, 1986) and their 'funds of knowledge' (Moll and Greenberg, 1990). Yet, students are less likely to be given access to different learning technologies in the classroom if the teacher is not confident about using them, which is what the findings of this study are suggesting is the case. Stockman and Truyen (2011, p.812) argue confidence and competence of teachers are two of the inner factors that will determine how effectively educational technology is embraced. From the responses of teachers in the current research, this would appear to be similarly influential in this educational setting too. Consideration of all other factors, allows the issues affecting teachers to be contextualised more effectively than a reductionist argument focussing solely on the skills gap affords. Hence, the existing empirical research can help to illustrate why a more refined argument is warranted. By way of example, Laurillard (2002, p.141) when focusing on the adoption of learning technologies in universities, conjects that these institutions are failing to engage with the full potential of learning technologies because academics are unable to move on from the model of transmission teaching. Furthermore, even though one teacher taking part in Hughes (2011, p.60) research described themselves as a 'Luddite': a sentiment that again could be used to draw attention to the skills gap, it is important not to isolate one factor, at the expense of ignoring the myriad of others. Stockman and Truyen (2011, p.812) considered some of these other factors, such as time, the technology itself, the community or network of support teachers can access, and the beliefs teachers have. The current study supports the view that it is important for a range of issues to be considered within the college when exploring how to support teachers to further develop their digital literacy. Activity Theory can help to keep the different factors in perspective as well as reveal the different tensions that arise within the activity system. In figure 5.1 the activity triangle is used where the issue of the 'skills gap' for teachers is problematized, as a way of illustrating the complexity of issues that senior management need to consider. The green lines

highlight three lines of particular tension that have particular relevance to this research, although there are others.

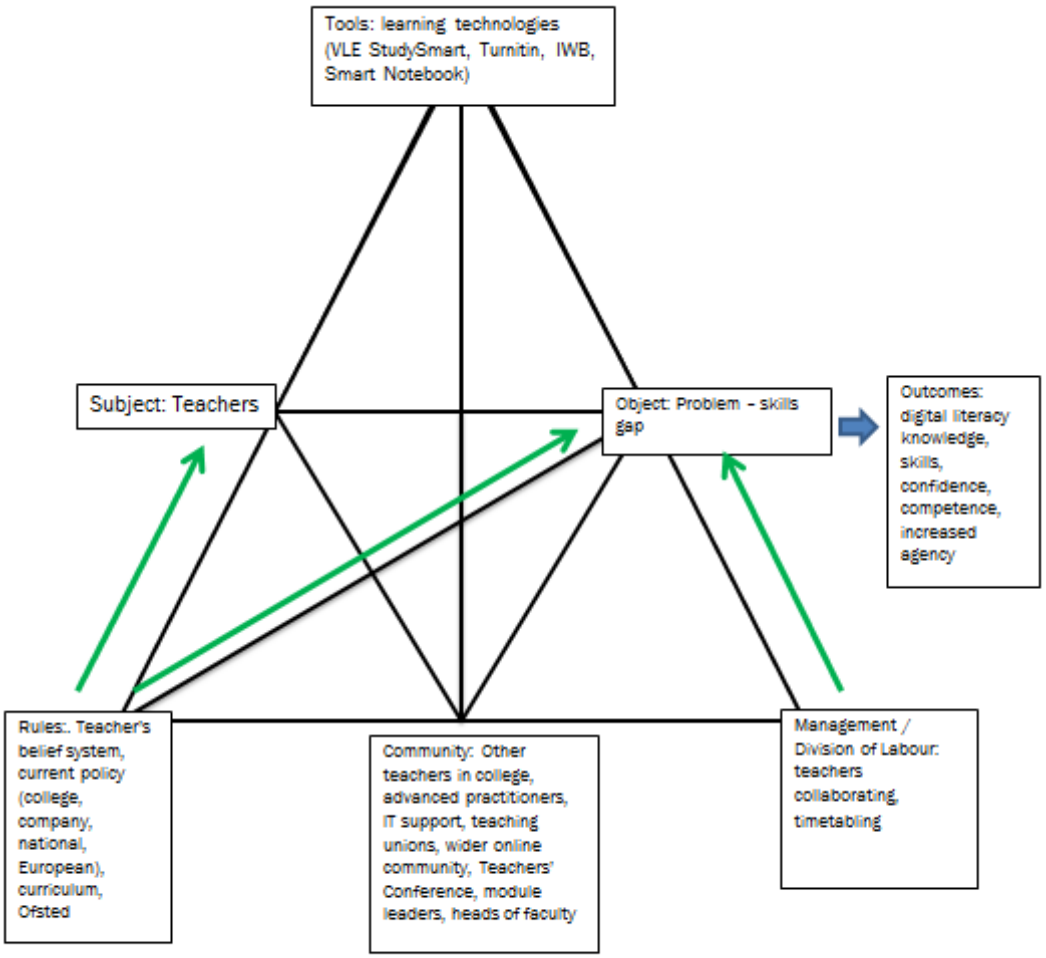


Figure 5.1: Teacher Activity System (adapted from Engestrom, 1994)

5.2 Teacher and Student Feedback

This chapter has examined the results of the Teacher Skills Audit and mapped the key issues on to the Activity Theory triangle; by doing so the tensions that arise in certain parts of the activity system have been highlighted. In the next part of this chapter, the

data analysis and discussion will look at the common themes that arose from three data sources:

1. Asking students: What do students think teachers should know about digital literacy?
2. Asking students: How can teachers help students with their digital literacy?
3. Asking teachers to comment on selected quotes from students on the two questions.

The main themes and key data from each source are presented in the tables below:

Table 5.1: What do students think teachers should know about digital literacy?

Theme	**Key Data**
E-safety	Differentiate sources, critically examine websites, know the dangers of plagiarism, respect copyright
Collaboration	Establish digital exchanges with colleagues, communicate with students using technology, share digital techniques with parents, learn new digital techniques with students
Experts	Effectively answer student queries (navigation or evaluation), advise students, pass on expertise
Teaching	Discover the best way for students to learn, make lessons more fun and enjoyable, incorporate technology, encourage not encroach, integrate videos and podcasts into lessons, do not only rely on slideshows during lessons, keeping it 'old school' is perfectly fine, continuously improve teaching skills, well versed in creative aspect, experiment

Theme	Key Data
Competency	Know how to use educational software Study Smart, Turnitin, WriteCheck, a wide knowledge of basic programmes, understanding internet speak, translate important information, prepare and provide online notes and revision; read, comprehend and manoeuvre around multiple platforms
Knowledge	Well versed in essential elements of digital literacy, duty to have knowledge about digital literacy, be digitally literate in every aspect, use ISTE standards to assess level of digital literacy, know as much about digital literacy as possible
Digital immigrants	Stay up to date, be better than students at using it, be 'IT savvy', navigate well in digital world, immerse themselves, be more pro-active, narrow the generation gap

Table 5.2: How can teachers help students with their digital literacy?

Theme	Key Data
Access	Incorporating technology into lessons to expose students more, help students by embracing technology, ask students to create and present, giving students the opportunity to experiment and try new programmes, get students to do more presentations, help them to gain a wider knowledge of digital world, help students unravel the intricacies of the digital realm, have oversight of children from less fortunate backgrounds
Collaboration	Exploring new programmes with students

Theme	Key Data
E-safety	Teach digital citizenship and internet etiquette, teach students to produce their version of information, how to evaluate the credibility of their sources, plagiarism and what is considered plagiarism, get students used to using academic plagiarism detectors, help students stay safe online, recommend safety programmes to students' parents
Teaching	More awareness of digital literacy, use and encourage use of online portal (StudySmart), use social media to encourage students to read more news, a more interactive method of teaching, engage students with the use of digital devices, use videos to capture students' attention and less boring (lessons), explore non-traditional methods of teaching
Modelling	Act as a guide to virtual platforms, teachers being digitally literate themselves,
Skills	Use computer programmes and fully utilize their (student) own devices, teaching students how to do it ('cruise through the virtual flux of information seamlessly') on their own, teaching students tips and tricks

Table 5.3: Data Analysis Grid for Teacher Comments on Student Feedback

Theme	Key Data
Access	Students NEED us and our academic skills to help them navigate these spaces; guide students through acquiring their own independent study skills, including being digitally literate; digital literacy skills are necessary for the future and should be incorporated into all subject areas; do we exclude teachers who won't or don't learn digital skills from the profession?
Collaboration	Teachers need to be alongside young people as they use technology, not leave them on their own too much; interpersonal connectivity in the classroom; sometimes students can guide teachers – collaborative learning
E-safety	Students are quite naïve about the media; e-safety is safeguarding – a matter for home and school in partnership; create a safe and encouraging environment for students to explore, make mistakes and learn from them
Ethical Issues	Young people need digital literacy skills in order to partake in knowledge economy
Traditional Study Skills	Balance is needed, is it necessary to leave behind traditional methods entirely? Pass on to students thinking and investigating skills so that they can continue to learn as digital resources change; learn value and integrity of traditional research methods; teachers modelling critical thinking is crucial but coupled with digital skills; students need to develop their reflective practice
Definitions	What constitutes digital literacy? Difficult to meet expectations if these are never clearly defined.

Theme	Key Data
Digital Experts	The 'generation gap' or 'digital immigrants' is a myth; The teacher can't be the magic 'knower of all software'; teachers should be digitally literate, however there is still room for those who are not
Teaching	More flipped learning and less didactic teaching

From the three data tables, a strong thread emerges of important issues for both students and teachers. The literature review in chapter 2 explored the definitions of digital literacy and the key issues in the empirical literature. It is not the intention to recap all those themes in the remaining part of this chapter. Instead, this chapter will focus on the key issues and challenges that need to be debated and addressed further in the college: access; digital expertise; teaching; and e-safety.

5.2.1 Access

This is a hidden issue that has revealed itself to be of vital significance for students, teachers and therefore for senior management and policy makers within the organisation. What emerges clearly from the data is that students are not getting the access that they need to learning technologies and a range of digital literacy opportunities. The repeated comments from students asking for more opportunities to practise with the technology in the class are a testament to this '…consider letting students do more presentations so that we can be better equipped and improve our digital literacy skills' (Mu). Indeed, students view lessons as one of the key ways that they can be introduced to new ideas and keenly understand how it can improve their social and cultural capital (Bourdieu, 1986; Ere,l 2010).

Equally, it is clear from the teacher generated data that teachers acknowledge the access opportunities they can support students with in terms of helping them develop their digital literacy skills. 'Student's NEED us and our academic skills to help them navigate these spaces' [original emphasis] (Teacher George). Some teachers in this study argue that access to digital literacy is an ethical issue, with an impact on student lives, that reaches far beyond the boundaries of the college and wider organisation: 'Young people need digital literacy skills in order to partake in the knowledge economy' (Teacher Devlin). Activity Theory reveals the complex range of issues that conspire to limit student access and these are a salient reminder not to place sole responsibility for improving student digital literacy on the shoulders of teachers (Voithofer and Foley, 2007). As teacher Sandra asserts 'The teacher can't be the magic "knower of all software"'. The curriculum needs to have the depth and breadth to support and provide access to learning technologies and a range of other digital literacy skills, competencies and knowledge that students need to be digital citizens who are fully equipped for their future. Additionally, senior leadership in the school has a role to play in helping teachers to get the training and time needed to support development of their digital literacy, 'there should be greater consistency in the approach to training teachers to be able to use learning technologies' (Teacher Helen).

5.2.2 Digital Experts

The findings from both student and teachers, confirm that the debate about students being digital natives is a generalisation and one that unhelpfully directs focus away from the additional support students need. Students want teachers to 'help students unravel the intricacies of the digital realm' (Lee). One teacher in this study notes

> The "generation gap" or "digital immigrants" is a myth…many of my students who are 20 years younger than me, have digital skills lagging behind those of myself and my peers (Teacher Ricardo).

Additionally, it is clear from the study that students have many expectations about the digital expertise of teachers and teachers need to be able to manage student expectations. A number of students in this study had an expectation that teachers should be 'as up to date as students' (Wan) and 'be digitally literate in every aspect' (Michelle). Although the majority of teachers commenting on student feedback agreed teachers should be digitally literate, one teacher likened the student demand that all teachers be digital experts, to asking a Biology teacher to be fluent in French. This teacher felt a working knowledge was more reasonable and realistic 'enough to communicate but cannot be expected to be fluent if there is no need' (Teacher Christa). The findings highlight the importance of managing student expectations in this area, especially as the marketing material for the college emphasises the leading technology used in every classroom. As the customer, students a have a right to be vocal about their experience and as student recommendations are vital to enrolment figures, senior leaders are pivotal in helping to manage student/market expectations too.

The findings revealed an insightful spectrum of views amongst teachers, including: a view that staying up to date with digital skills is a professional responsibility for teachers (Teacher Hugh); to a view that teachers may be excluded if they do not have adequate skills '…do we exclude teachers who won't or don't learn digital skills from the profession?' (Teacher Samantha) Plus a very clear statement:

> What message does it send a student when their teacher (who is trying to motivate them to learn) is not motivated enough themselves to embrace digital technologies? (Teacher George)

5.2.3 Teaching

Whilst responsibility for developing student digital literacy should not rest solely with teachers, it is essential to acknowledge that teachers do have a significant role to play in how digital literacy is embedded in lessons for their subject area. Students in this study have raised the issue of teachers using different aspects of learning technology to

engage the students and to make lessons ‘less boring’ (Mu), whilst some teachers have called for 'less didactic teaching' (Teacher Samantha). A clear message emerges from the findings: teachers need to incorporate more exciting and creative methods into their teaching and learning technologies offer one opportunity of doing this. Students also want more collaboration with teachers, to have more hands on chances to use the technology available because they feel this will ‘allow a more interactive and engaging session for everyone’ (Amelia). This is in line with the findings of Beckman et al.(2014, p.8) whose investigation found that, ‘tasks in which students interact, create and publish using technologies were rare’. There are teachers who support collaboration ‘sometimes students can guide teachers instead of the other way around’ (Teacher Hilary).

I agree with Jenkins et al. (2009, p.viii) that ‘schools as institutions have been slow to react to this participatory culture…Participatory culture shifts the focus of literacy from individual expression to community involvement’. Teachers have an important role to play in helping students to be able to learn and practice these collaborative participatory skills in the classroom but it is disingenuous to lay sole responsibility for making this happen with teachers. As Voithofer and Foley (2007) insist, it is vital to be aware of the discourse that makes teachers responsible alone, for its impact on teacher agency and its ability to distract attention from policy and curriculum issues that govern classrooms.

5.2.4 E-safety

The findings show that several students in all phases of the study had concerns about e-safety. The range of issues that they raised demonstrates the broad spectrum of issues that e-safety embraces, from scams, cyberbullying, sexting, plagiarism, digital etiquette, to critical analysis and evaluation of information. Coupled with this, teachers in this study expressed concerns about students’ ability to critically engage with information

they are exposed to in the digital world. Ringrose et al. (2012, p.59) wisely caution ‘not [to] overestimate young people’s digital literacy and safety skills’. Offering the classroom as a place to 'create a safe and encouraging environment for students to explore, make mistakes and learn from them' (Teacher Helen) is one way in which students can be supported to develop these vital skills and knowledge.

Having considered these four key issues that have emerged from the findings, the final activity system triangle is presented below (Fig. 5.2), in which the key issue of access is problematized. By making access the focus, it is hoped that a more nuanced approach to dealing with the issue may result and it may prompt a more in depth discussion about digital literacy amongst stakeholders within the college and beyond. These ideas are expanded upon in the next chapter along with the recommendations for the college and for future research.

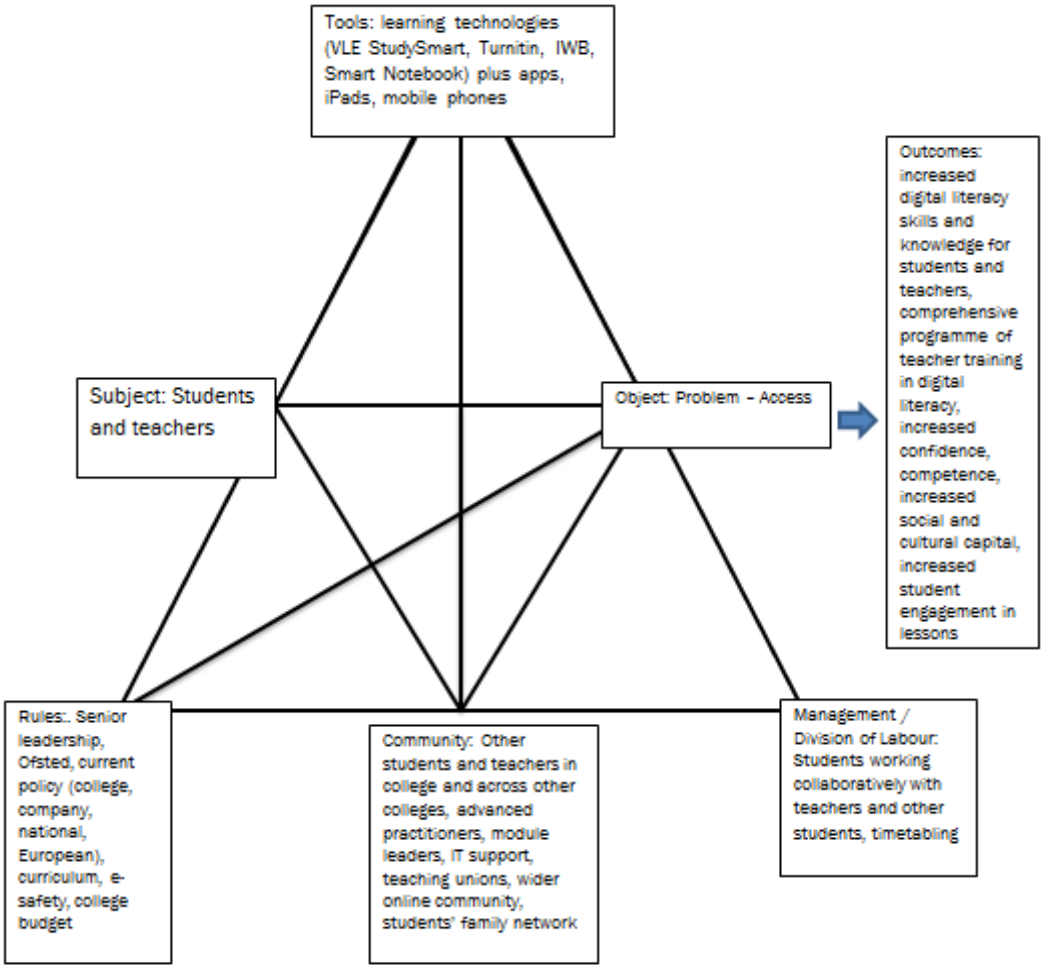


Figure 5.2: Access as a key issue in the Activity System (adapted from Engestrom, 1994)

Chapter Six - Conclusion

One of the strengths of the learning technologist team is our ability to collaborate and this study has again proved this. Having a team of colleagues who can help give critical feedback, open up new perspectives and provide support and encouragement has been invaluable in this research. When the initial findings were presented to a meeting of the team and several senior managers in the organisation, there was agreement that digital literacy is a topic of vital significance to the organisation and one which must be acted upon. This has been a validation of our work as a team. This research has been instrumental in raising the issue of digital literacy across the four colleges, with one other college committing to carrying out a teacher skills audit, as a result.

This research study set out to investigate the digital literacy skills of students and teachers in the international college where I work. Activity Theory revealed hidden issues in the activity system and the influencing factors of the wider context in which students learn, both in the virtual and real world because: 'education never takes place in a social or cultural vacuum' (Mercer, 1995, p.96). In this study, students asked for more chances to access learning technologies in the classroom; to be invited to participate more in lessons and have increased opportunities to collaborate with teachers in the real and the virtual world. This supports the findings of Helsper and Eynon (2010, p.515) who draw attention to the influence of 'immersion in a digital environment' and 'breadth of use' upon an individual's propensity to use digital technology. Equally, Pedder and Ruddick (2006, p.145) remind us that 'However good pupils' ideas might be, it is the teachers' responsiveness to them that is ultimately important'. The students in this study are no exception to this and teachers need to increase student engagement through the use of learning technologies in the classroom and work collaboratively with students to do so.

This research found little evidence to support the generalisation that young people are digital natives (Prensky, 2001). Although students recognise that they can adopt and

learn how to use many new digital devices with ease, they still want teachers to teachers to help:

> I feel that teachers need to recognise that students … are not naturally digitally literate, and would benefit greatly with some help in becoming digitally literate (Kimberly)

Especially with regard to e-safety, students want teachers to teach ways to stay safe online and to make recommendations to their parents too, plus give them opportunities to use plagiarism detection software. There is work to be done in this area in the college and even though the students' parents/guardians are not as accessible as UK based parents, there is potential for developing the partnership between college and parents further, to the advantage of the students, whether it be in the area of e-safety or more generally.

The student teacher relationship is one vital conduit through which students can develop their cultural and social capital and 'funds of knowledge' (Moll & Greenberg, 1990; Bourdieu, 1986) in conjunction with their peer and online networks and the majority of the students in this study were cognizant of this. Whilst the discourse on education (Reynolds & Stryszowski, 2014; Commission, 2015) tends towards a deterministic and economic agenda, focussing on the skills deficit of students and teachers, this study has shown and is supported by empirical research, that a focus solely on competencies and skills is not sufficient and is flawed as a way to prepare students comprehensively for their future. Furthermore, this study has found that both students and teachers are concerned with the need for creativity and collaborative exploration (Furlong & Davies, 2012; Jenkins et al., 2009). Teachers have a significant role to play in developing the digital literacy of students, including a strategic role in deciphering for students the dominant discourses which are shaping policy decisions. Additionally, the curriculum needs to have the breadth and depth to thoroughly prepare students for life in a global economy and a digital age and the findings from this study suggest that there are areas

for development that need to be addressed urgently for this to be achieved: in particular, access issues.

There is room for a debate in college about how to manage the expectation from students that ‘teachers should therefore be digitally literate in every aspect’ (Michelle). Senior leaders need to consider how such expectations can impact on the perception in the market of what this educational organisation offers.

In this study, the skills audit identified where immediate training is needed. A baseline of minimum digital literacy skills for teachers, could establish how effectively the college and wider organisation was dealing with the issue of upskilling teachers in various aspects of digital literacy. Alongside this a commitment to providing time within teacher timetables for regular training is also needed.

This study has provided clear evidence that a holistic approach towards developing the digital literacy for both students and teachers is needed: each group has strengths to share, as well as skills and knowledge development needs. The college and the wider organisation now have an ideal chance to address these issues by developing a strategic vision and policy that gives digital literacy the prominence it deserves.

Chapter Seven - References

Acquisiti, A., & Gross, R. (2006). Imagined communities: awareness, information sharing, and privacy on the Facebook. In P. Golle & G. Danezis (Eds.), *Proceedings of the 6th Workshop on Privacy Enhancing Technologies* (pp. 1–16). Cambridge, UK: Robinsons College.

Alexander, R. (2008). Talking, teaching, learning. In *Essays on Pedagogy* (pp. 92–120). Abingdon: Routledge.

Altrichter, H., Posch, P., & Somekh, B. (1993). *Teachers investigate their work: Introduction to the methods of action research*. London: Routledge.

Asher, A., & Duke, L. (2011). Searching for answers: student search behaviour at Illinois Wesleyan University. In A. Asher & L. Duke (Eds.), *College Libraries and Student Culture* (Vol. 4, pp. 71–85). Chicago: Americal Library Association. doi:10.2307/20635972

Avis, J. (2009). Transformation or transformism: Engeström's version of activity theory? *Educational Review*, *61*(2), 151–165. doi:10.1080/00131910902844754

Ba, H., Tally, W., & Tsikalas, K. (2002). Investigating Children ' s Emerging Digital Literacies. *Journal of Technology, Learning and Assessment*, *1*(4).

Beckman, K., Bennett, S., & Lockyer, L. (2014). Understanding students' use and value of technology for learning. *Learning, Media and Technology*, *0*(0), 1–22. doi:10.1080/17439884.2013.878353

Bennett, S., Maton, K., & Kervin, L. (2008). The "digital natives" debate: A critical review of the evidence. *British Journal of Educational Technology*, *39*(5), 775–786. doi:10.1111/j.1467-8535.2007.00793.x

Beqiri, E. (2010). Ict and E-Learning Literacy As an Important Component for the New Competency- Based Curriculum Framework in Kosovo. *Journal of Research in Educational Sciences*, *1*(1), 7–21.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241–258). New York: Greenwood Press.

Brandtzaeg, P., Heim, J., & Karahasanovic, A. (2011). Understanding the new digital divide - a typology of Internet users in Europe. *International Journal of Human-Computer Studies*, *69*, 123–138.

Bruce, B. M. D., & Core, C. (2011). Workplace Violence : and Response. *Public Personnel Management*, *40*(4), 293–309.

Bulger, M. E., Mayer, R. E., & Metzger, M. J. (2014). Knowledge and processes that predict proficiency in digital literacy. *Reading and Writing*, 1567–1583. doi:10.1007/s11145-014-9507-2

Burrell, G., & Morgan, G. (1979). *Sociological Paradigms and Organisational Analysis*. London: Heinemann Educational Books Ltd.

Camacho, M., Minelli, J., & Grosseck, G. (2012). Self and Identity: Raising Undergraduate Students' Awareness on Their Digital Footprints. *Procedia - Social and Behavioral Sciences*, *46*, 3176–3181. doi:10.1016/j.sbspro.2012.06.032

Childline. (2013). Can I tell you something? What's affecting children in 2013. Retrieved February 18, 2014, from http://www.nspcc.org.uk/news-and-views/latest-news/2014/childline-report/can-i-tell-you-something_wda100359.html

Cohen, L., Manion, L., & Morrison, K. (2013). *Research Methods in Education* (7th ed.). Hoboken: Taylor and Francis.

Crawford, K., & Hasan, H. (2006). Demonstrations of the Activity Theory Framework for Research in Information Systems. *Australian Journal of Information Systems*, *13*(2), 49–68.

Creswell, J. (2007). *Qualitative Inquiry and Research Design: choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage Publications Ltd.

Crook, C. (2012). The "digital native" in context: tensions associated with importing Web 2.0 practices into the school setting. *Oxford Review of Education*, *38*(1), 63–80. doi:10.1080/03054985.2011.577946

Dawkins, R. (1976). *The Selfish Gene*. Oxford, UK: Oxford University Press.

De Lange, T. (2011). Formal and non-formal digital practices: institutionalizing transactional learning spaces in a media classroom. *Learning, Media and Technology*, *36*(3), 251–275. doi:10.1080/17439884.2011.549827

Dornisch, M. (2013). The Digital Divide in Classrooms: Teacher Technology Comfort and Evaluations. *Computers in the Schools*, *30*(3), 210–228. doi:10.1080/07380569.2012.734432

Engestrom, Y. (1994). Teachers as collaborative thinkers: activity-theoretical study of an innovative teacher team. In I. Carlgren, G. Handal, & S. Vaage (Eds.), *Research on Teachers ' Thinking and Practice Teachers ' Minds and Actions :* (pp. 43–61). London: The Falmer Press.

Erel, U. (2010). Migrating cultural capital: Bourdieu in migration studies. *Sociology*, *44*(4), 642–660. doi:10.1177/0038038510369363

Erstad, O. (2012). The learning lives of digital youth—beyond the formal and informal. *Oxford Review of Education*, *38*(1), 25–43. doi:10.1080/03054985.2011.577940

Etherington, K. (2004). *Becoming a reflexive researcher: using ourselves in research*. London: Jessica Kingsley Publishers.

European Commission, E. (2015). The Digital Agenda. *Europe 2020 Stragegy*. Retrieved June 24, 2015, from http://ec.europa.eu/digital-agenda/en/our-goals

Eynon, R. (2009). Mapping the digital divide in Britain: implications for learning and education. *Learning, Media and Technology*, *34*(4), 277–290. doi:10.1080/17439880903345874

Eynon, R., & Malmberg, L.-E. (2011). A typology of young people's Internet use: Implications for education. *Computers & Education*, *56*(3), 585–595. doi:10.1016/j.compedu.2010.09.020

Facer, K. (2012). Taking the 21st century seriously: young people, education and socio-technical futures. *Oxford Review of Education*, *38*(1), 97–113. doi:10.1080/03054985.2011.577951

Fairclough, N. (1992). Intertextuality in critical discourse analysis. *Linguistics and Education*, *4*, 269–293. doi:10.1016/0898-5898(92)90004-G

Fairclough, N. (1999). Critical discourse analysis and the marketization of public discourse: the universities. *Discourse and Society*, *4*(2), 133–168. doi:0803973233

Fawley, N., & Krysak, N. (2012). Information Literacy Opportunities within the Discovery Tool Environment. *College & Undergraduate Libraries*, *19*(2-4), 207–214. doi:10.1080/10691316.2012.693439

Ferro, E., Helbig, N. C., & Gil-Garcia, J. R. (2011). The role of IT literacy in defining digital divide policy needs. *Government Information Quarterly*, *28*(1), 3–10. doi:10.1016/j.giq.2010.05.007

Freire, P. (2000). *Pedagogy of the Oppressed* (30th ed.). New York: Continuum.

Furlong, J., & Davies, C. (2012). Young people, new technologies and learning at home: taking context seriously. *Oxford Review of Education*, *38*(1), 45–62. doi:10.1080/03054985.2011.577944

Gilster, P. (1997). *Digital Literacy*. New York: Wiley.

Goodfellow, R. (2011). Literacy, literacies and the digital in higher education. *Teaching in Higher Education*, *16*(1), 131–144. doi:10.1080/13562517.2011.544125

Hague, C., & Payton, S. (2010). *Digital literacy across the curriculum: a Futurelab handbook*. Bristol, UK: Future Lab.

Harrison, Y. D., Kostic, K., Toton, S. C., & Zurek, J. (2010). Globalizing social justice education: The case of the Global Solidarity Network Study e-Broad Program. *Internet and Higher Education*, *13*(3), 115–126. doi:10.1016/j.iheduc.2009.12.005

Hatlevik, O. E., & Christophersen, K. A. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers and Education*, *63*, 240–247. doi:10.1016/j.compedu.2012.11.015

Hatt, B. (2012). Smartness as a cultural practice in schools. *American Educational Research Journal*, *49*(3), 438–460.

Helsper, E. J., & Eynon, R. (2010). Digital natives: where is the evidence? *British Educational Research Journal*, *36*(3), 503–520. doi:10.1080/01411920902989227

Hsu, H.-Y., & Wang, S. (2010). The Impact of Using Blogs on College Students' Reading Comprehension and Learning Motivation. *Literacy Research and Instruction*, *50*(1), 68–88. doi:10.1080/19388070903509177

Hughes, J. (2011). "It"s quite liberating turning up to a classroom without a pile of papers and equipment.' Pedagogic bungee jumping: a strategy to rethink teaching in a technology-rich age? *Management in Education*, *26*(2), 58–63. doi:10.1177/0892020611

Hvidston, D. J., Hvidston, B. A., Range, B. G., & Harbour, C. P. (2013). Cyberbullying: Implications for Principal Leadership. *NASSP Bulletin*, *97*(4), 297–313. doi:10.1177/0192636513504452

Jenkins, H. (2013). Rethinking "Rethinking Convergence/Culture." *Cultural Studies*, *28*(2), 267–297. doi:10.1080/09502386.2013.801579

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. J. (2009). *Confronting the Challenges of Participatory Culture*. Massachusetts.

JISC. (2011). Developing Digital Literacies : Briefing Paper in support of JISC Grant Funding 4 / 11. Retrieved January 3, 2015, from http://www.jisc.ac.uk/fundingopportunities/funding_calls/2011/204/grant411.aspx

JISC. (2014). Developing digital literacies. Retrieved December 1, 2014, from https://www.jisc.ac.uk/guides/developing-digital-literacies

Kemmis, S., & McTaggart, R. (1988). *The Action Research Planner*. (S. Kemmis & R. McTaggart, Eds.) (1st ed.). Geelong, Victoria: Deakin University Press.

Kuiper, E., Volman, M., & Terwel, J. (2009). Developing Web literacy in collaborative inquiry activities. *Computers and Education*, *52*(3), 668–680. doi:10.1016/j.compedu.2008.11.010

Laurillard, D. (2002). Knowledge Society. *EDUCASE Review*, *37*(1), 16–25. doi:10.1080/0305792022000007463

Lea, M. (2013). Reclaiming literacies: competing textual practices in a digital higher education. *Teaching in Higher Education*, *18*(1), 106–118. doi:10.1080/13562517.2012.756465

Lea, M., & Jones, S. (2011). Digital literacies in higher education: exploring textual and technological practice. *Studies in Higher Education*, *36*(4), 377–393. doi:10.1080/03075071003664021

Lea, M. R., & Street, B. V. (2006). The "Academic Literacies" Model: Theory and Applications. *Theory Into Practice*, *45*(4), 368–377. doi:10.1207/s15430421tip4504

Legislation.Gov.UK. (2015). Data Protection Act 1988. Retrieved January 20, 2015, from https://www.gov.uk/data-protection/the-data-protection-act

Leont'ev, A. (1981). *Problems of the development of the mind*. Moscow: Progress.

Livingstone, S. (2012). Critical reflections on the benefits of ICT in education. *Oxford Review of Education*, *38*(1), 9–24. doi:10.1080/03054985.2011.577938

Marquez-Zenkov, K., Harmon, J., van Lier, P., & Marquez-Zenkov, M. (2007). If they'll listen to us about life, we'll listen to them about school: seeing city students' ideas about "quality" teachers. *Educational Action Research*, *15*(3), 403–415. doi:10.1080/09650790701514457

Martin, A., & Grudziecki, J. (2007). DigEuLit : Concepts and Tools for Digital Literacy Development. *Italics*, *5*(4).

Martin, D., & Peim, N. (2009). Critical perspectives on activity theory. *Educational Review*, *61*(2), 131–138. doi:10.1080/00131910902844689

Masterman, E., & Shuyska, J. A. (2011). Digitally mastered? Technology and transition in the experience of taught postgraduate students. *Learning, Media and Technology*, *37*(4), 335–354. doi:10.1080/17439884.2011.608361

Matthews, N., & Sunderland, N. (2013). Digital Life-Story Narratives as Data for Policy Makers and Practitioners: Thinking Through Methodologies for Large-Scale Multimedia Qualitative Datasets. *Journal of Broadcasting & Electronic Media*, *57*(1), 97–114. doi:10.1080/08838151.2012.761703

McKay, J., & Marshall, P. (2001). The dual imperatives of action research. *Information Technology & People*, *14*(1), 46–59. doi:10.1108/09593840110384771

McLeod, J. (2001). *Qualitative Research in Counselling and Psychotherapy*. London: Sage Publications Ltd.

McTaggart, R. (1994). Participatory Action Research: issues in theory and practice. *Educational Action Research*, *2*(3), 313–337. doi:10.1080/0965079940020302

Mercer, N. (1995). *The Guided Construction of Knowledge: talk amongst teachers and learners*. Clevedon: Multilingual Matters Ltd.

Moll, L., & Greenberg, J. (1990). Creating zones of possibilities: combining social contexts for instruction. In L. Moll (Ed.), *Vygotsky and education: instructional implications and applications of sociohistorical psychology* (pp. 319–348). Cambridge: Cambridge University Press.

Montgomery, S. E. (2014). Critical Democracy Through Digital Media Production in a Third-Grade Classroom. *Theory & Research in Social Education*, *42*(2), 197–227. doi:10.1080/00933104.2014.908755

Morgan, D. (1996). Focus groups. *Annual Review of Sociology*, *22*, 129–152.

Nelson, K., Joseph, G. W., & Courier, M. (2010). Teaching Tip An Investigation of Digital Literacy Needs of Students. *Journal of Information Systems Education*, *22*(2), 95–110.

Nelson, P., Cox, H., Furze, G., Lewin, R., Morton, V., Norris, H., … Carty, R. (2013). Participants' experiences of care during a randomized controlled trial comparing a lay-facilitated angina management programme with usual care: A qualitative study

using focus groups. *Journal of Advanced Nursing*, *69*(4), 840–850. doi:10.1111/j.1365-2648.2012.06069.x

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers and Education*, *59*(3), 1065–1078. doi:10.1016/j.compedu.2012.04.016

Norris, A. E., Aroian, K. J., Warren, S., & Wirth, J. (2012). Interactive performance and focus groups with adolescents: The power of play. *Research in Nursing and Health*, *35*(6), 671–679. doi:10.1002/nur.21509

O'Hanlon, C. (2003). Action Research for Inclusive Practices. In *Educational Inclusion as an interpretive discourse*. Maidenhead: Open University Press.

OECD. (2013). Programme for International Student Assessment (PISA). Retrieved January 11, 2014, from http://www.oecd.org/pisa/aboutpisa/pisafaq.htm

Patchin, J. W., & Hinduja, S. (2015). Measuring cyberbullying: Implications for research. *Aggression and Violent Behavior*. doi:10.1016/j.avb.2015.05.013

Pedder, D., & McIntyre, D. (2006). Pupil consultation: the importance of social capital. *Educational Review*, *58*(2), 145–157.

Pow, J., & Fu, J. (2012). Developing Digital Literacy through Collaborative Inquiry Learning in the Web 2 . 0 Environment – An Exploration of Implementing Strategy Findings of a Case Study. *Journal of Information Technology Education: Research*, *11*, 287–299.

Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, *9*(5), 1–6. doi:10.1108/10748120110424816

Prescott, T. (2009). *What is the coach's experience of helping the client progress?* M.A. Dissertation. Oxford Brookes University.

Prescott, T. (2012). How does using Turnitin in a formative way change student attitudes towards plagiarism ? In *5th International Plagiarism Conference*. Gateshead.

Reynolds, T., & Stryszowski, P. (2014). *Skills and jobs in the Internet economy*. *OECD Digital Economy Papers*. OECD Publishing. doi:10.1787/5jxvbrjm9bns-en

Ringrose, J., Gill, R., Livingstone, S., & Harvey, L. (2012). *A qualitative study of children , young people and ' sexting ': a report prepared for the NSPCC*. London.

Roth, W.-M., & Lee, Y.-J. (2007). "Vygotsky's Neglected Legacy": Cultural-Historical Activity Theory. *Review of Educational Research*, *77*(2), 186–232. doi:10.3102/0034654306298273

Rushton, D., & Lahlafi, A. (2013). Development, Implementation and Impact of Active and Reflective Learning Initiatives to Improve Web Searching Skills of International Business Students at Sheffield Hallam University, UK. *Procedia - Social and Behavioral Sciences*, *93*(0), 885–894. doi:http://dx.doi.org/10.1016/j.sbspro.2013.09.298

Sam, C. (2012). Activity Theory and Qualitative Research in Digital Domains. *Theory Into Practice*, *51*(2), 83–90. doi:10.1080/00405841.2012.662856

Selwyn, N. (2012). Making sense of young people, education and digital technology: the role of sociological theory. *Oxford Review of Education*, *38*(1), 81–96. doi:10.1080/03054985.2011.577949

Sharples, M., Graber, R., Harrison, C., & Logan, K. (2009). E-safety and Web 2.0 for children aged 11-16. *Journal of Computer Assisted Learning*, *25*(1), 70–84.

Simsek, E., & Simsek, A. (2013). New Literacies for Digital Citizenship. *Contemporary Educational Technology*, *4*, 126–137.

Slekar, T., & Haefner, L. (2010). Syntactic Knowledge in History and Science Education : Teacher Education and Neglect in the Academy. *Journal of Thought*, *4*(12), 7–16.

Stenhouse, L. (1975). *An Introduction to Curriculum Research and Development*. London: Heinemann.

Stevenson, I. (2008). Tool, tutor, environment or resource: Exploring metaphors for digital technology and pedagogy using activity theory. *Computers & Education*, *51*(2), 836–853. doi:10.1016/j.compedu.2007.09.001

Stockman, C., & Truyen, F. (2011). The Danger of the Downward Spiral : Teachers and Digital Literacy. In *10th European Conference on e-learning* (pp. 811–819). Brighton: Academic Publishing Limited.

Stringer, R. (2007). *Action Research* (3rd ed.). Thousand Oaks, CA: Sage Publications Ltd.

The.University.of.Exeter. (2015). What sort of digital scholar are you? Retrieved January 20, 2014, from http://as.exeter.ac.uk/cascade/digital-scholars/researcher-resources/quiz/

Tracy, S. J. (2010). Qualitative Quality: Eight “Big-Tent” Criteria for Excellent Qualitative Research. *Qualitative Inquiry*, *16*(10), 837–851. doi:10.1177/1077800410383121

Van Der Veer, R. (2007). *Lev Vygotsky*. London: Continuum International Publishing Group.

Voithofer, R., & Foley, A. (2007). Digital Dissonances: Structuring Absences in National Discourses on Equity and Educational Technologies. *Equity & Excellence in Education*, *40*(1), 14–25. doi:10.1080/10665680601088515

Vygotsky, L. (1978). *Mind in Society: the development of higher psychological processes*. Cambridge: Harvard University Press.

Willig, C. (2009). *Introducing qualitative research in psychology* (2nd ed.). Maidenhead: Open University Press.

Wills, M. (1999). Bridging the Digital Divide. *Adults Learning*, (December), 10–11.

Wolfe, K. L., Phillips, W. J., & Asperin, A. (2014). Examining Social Networking Sites as a Survey Distribution Channel for Hospitality and Tourism Research. *Journal of Quality Assurance in Hospitality & Tourism*, *15*(2), 134–148. doi:10.1080/1528008X.2014.889519

Yamagat-Lynch, L. (2010). *Activity Systems Analysis Methods: Understanding Complex Learning Environments*. New York: Springer.

Young, M. (2009). What are schools for? In H. Daniels, H. Lauder, & S. Hartshorn (Eds.), *Knowledge , Values and Educational Policy A critical perspective* (pp. 10–18). London: Routledge.

Zhao, S., Grasmuck, S., & Martin, J. (2008). Identity construction on Facebook: Digital empowerment in anchored relationships. *Computers in Human Behavior*, *24*(5), 1816–1836. doi:10.1016/j.chb.2008.02.012

Zhong, Z.-J. (2011). From access to usage: The divide of self-reported digital skills among adolescents. *Computers & Education*, *56*(3), 736–746. doi:10.1016/j.compedu.2010.10.016

Appendix A: CUREC Form (extract)

University of Oxford

CENTRAL UNIVERSITY RESEARCH ETHICS COMMITTEE (CUREC)

CUREC/1A Checklist for the Social Sciences and Humanities

SECTION A	**Yes**	**No**
1) Are you using research methodologies commonly used in biomedical or behavioural laboratory sciences?		x
2) Is there a significant risk that the research will induce anxiety, stress or other harmful psychological states in participants that might persist beyond the duration of any test or interview in which they are participating?		x
3) Will the research involve human participants recruited by means of their status as present or past NHS patients or their relatives or carers?		x
4) Does the research involve *human participants aged 16 and over who do not have *capacity to consent for themselves? See the Mental Capacity Act 2005		x
5) Is the study to be funded by the US National Institutes of Health or another US federal funding agency?		x

Appendix B: CUREC Approved Letter to Principal

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Director Professor Ernesto Macaro
18 December 2014

[redacted]
Interim Principal
[redacted] Oxford

Dear [redacted]

I am writing to enquire about conducting research in college this academic year and ask for your consent. I am studying for the Master's in Learning and teaching at Oxford University, supervised by Dr Rebecca Eynon. In my final research project, 'Where are the digital natives? Identifying and mapping digital literacy skills of students and teachers in an international college.' I will explore the current level of digital literacy amongst students and teachers at the college.

The research will take place with [redacted] students, as well as teachers based at the centres in [redacted] and [redacted], through the Advanced Practitioner team, who have agreed to collaborate with me on this. I am aiming to use the opinions generated by students through their written work and an online survey, to generate a discussion with teachers on digital literacy amongst students. The research will also be to identify the current digital literacy skills of teachers and any training needed, through answers to a series of questions using an online survey, followed by a focus group with teachers.

By participating in the research, the college would be contributing to a project that will deepen the college's understanding of digital literacy amongst international students and so contribute towards developing training for teachers that will better support students to navigate the digital world more effectively. It will also contribute to wider discussions on digital literacy and student understandings of it.

I hope to conduct this research between January 2015 and June 2015. I would photocopy some of the students' written work, use an online survey for gathering student opinions and ask teachers engaged in a focus group discussion for written feedback.

Oxford University has strict ethical procedures on conducting ethical research with teachers and young people, consistent with current British Educational Research Association guidelines. As practitioner research however, the University recognises that schools have the highest ethical standards in any event. Therefore only your consent is necessary, and not that of parents. Throughout the research, students and other teachers will be able to refuse to participate in any research activities at any time.

All participants, including students, teacher and the school, would be made anonymous in all research reports. The data collected would be kept strictly confidential, available only to my supervisor and me and not used other than specified without further consent.

If you would like more information about what is involved, please contact me.

I look forward to hearing from you.

Yours sincerely
Tanya Prescott

Research Questions:

How do students define digital literacy?
How do teachers define digital literacy?
Where are the gaps in support for students and teachers?

Appendix C: Learning Journals (from Group 1 and Group 2)

Group 1: Learning Journal 1

Read the following definition of digital literacy from Casey and Bruce (2010):

Answer the following questions:

1. What does digital literacy mean to you? Think about the ways in which you are digitally literate and list as many of them as possible using a combination of words, pictures and video clips, where relevant.
2. Is digital literacy relevant to you?
3. If yes, why or how is it relevant to you?
4. If no, why do you think it is not relevant to you?
5. How digitally literate do you think you are? Rate yourself out of 10 (1 = not very digitally literate, 10 = highly digitally literate). Explain fully why you gave yourself this mark.

Group 1: Learning Journal 2

Use the examples below to think of the different ways in which you are digitally literate. Your task this week is to provide visual evidence of this. Use a range of images, video clips, graphics etc. The emphasis is on using visual material you have created yourself**. Upload/paste these**

images into your Learning Journal page on your Weebly website.

Examples of Digital Literacy

- Understanding how to use web browsers, search engines, email, text, wiki, blogs, Photoshop, PowerPoint, video creation/editing software , etc. to showcase learning.
- Evaluating online resources for accuracy/trustworthiness of information.
- Using online classes to enhance learning in the classroom.
- Choosing appropriate media to showcase learning - understand what platforms will best illustrate your message and learning to peers and educators.
- Using an interactive whiteboard in the classroom for lessons and allowing students to use the interactive whiteboard on a daily basis.
- Encouraging students to use technology to showcase their learning e.g. Mahara portfolio, Weebly website
- Using the web (web sites video, music) to enhance the learning of your students.
- Students and teachers creating online content to be utilized both in and out of the classroom.

(Reference: http://purposefultechnology.weebly.com/creating-digital-citizens---what-is-digital-literacy.html)

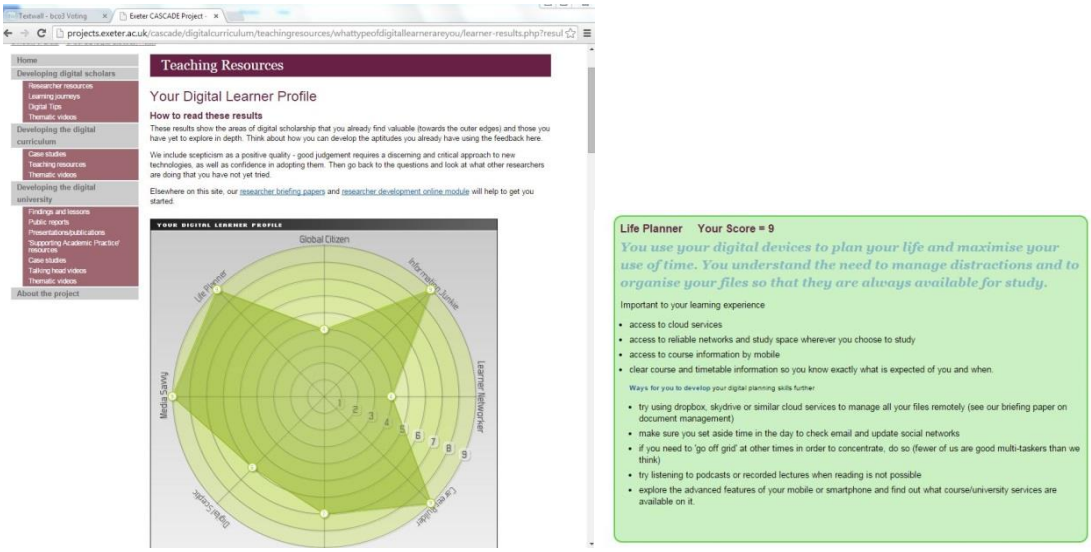
Group 1: Learning Journal 3

This week your task is to complete the digital literacy quiz on this website:

http://projects.exeter.ac.uk/cascade/digitalcurriculum/teachingresources/whattypeofdigitallearnerareyou/digitallearnerquiz.php#.VQGMofmsVVI

1. Once you have completed the quiz, you will need to take a screen shot of the analysis that it provides. It will look something like this and will include at least nine (9) different scores.

2. You must include all of the scores and comments in your screenshot.
3. Your screenshots should be pasted onto a Word document and then sent to your teacher (remember to put your name on your work):



Group 2: Learning Journal 1

‘What do I think I need to know or do to be digitally literate?’

Your first learning journal task will involve you reading what other students have written about digital literacy, writing a short learning journal entry about what you think you should know about digital literacy, filming yourself talking and finally using that film clip to create an augmented reality poster. Here are the steps:

Step 1
Use the links to look at what other students have written about digital literacy. The password is
[redacted]my-learning-journal
[redacted]/my-learning-journal
[redacted]/my-learning-journal/digital-literacy#comments
[redacted]my-learning-journal

Step 2
Next, create a new learning journal entry on your ‘My Learning Journal’ page on Weebly. Write in it what you think you need to know in order to be digitally literate (minimum 200 words). Think about your technical skills, online social networking skills, your ability to create new content, your ability to critically engage with what you are reading and using online etc.
TIP 1: Always answer all the questions in your learning journal brief. Otherwise, if you do not, you will get a lower grade.
TIP 2: Try to write using your own words. If you use text and images from another source, you will need to provide a reference. If you do not reference your work, you will get a zero mark for plagiarism.

Step 3

Then, you will use what you have written to help you speak for approximately 1 minute whilst you film yourself (or get another student to film you) talking about what you think you need to know in order to be digitally literate.

Step 4

Finally, use the short video clip you have made, to create an augmented reality poster, using the Aurasma app. Your teacher will have shown you how to do this in class and you will have downloaded the free app and set up your own account. Test out that your poster works. Upload a screenshot of your poster to your learning journal page.

Remember:

To include your Aurasma account name so that other people can follow you and see your aura.

To click ‘publish live’ and ‘publish’ on your website or your teacher will not be able to see your work.

Group 2: Learning Journal 2

What do teachers need to know about digital literacy?
How can teachers help students with their digital literacy?

These are the two questions that you will need to answer in this learning journal entry and you will be asking other students to answer these questions too. Here are the steps you will need to follow:

Step 1
Create a new learning journal entry on your 'My Learning Journal' page on Weebly. Write your answers to the two questions in your learning journal (minimum 200 words).

TIP 1: Always answer all the questions in your learning journal brief. Otherwise, if you do not, you will get a lower grade.
TIP 2: Try to write using your own words. If you use text and images from another source, you will need to provide a reference. If you do not reference your work, you will get a zero mark for plagiarism.

Step 2
You will need to ask 5 other students in the college for their answers to these questions. Make sure that you do not ask the same five students that anyone else in your CIT class is speaking to. In order for your five students to answer this question, you may need to explain to them what digital literacy is first. Film their answers or write them down (you will need at least one video clip of one student answer). Upload the video clips and /or write their answers in your learning journal. Remember not to use any real names. Use a code for each student e.g. STU1, STU2.

Step 3
You will now need to use one video clip (the best one, hopefully) of a student answering your questions, to create an augmented reality poster. Remember to make your aura 'public' so that it can be seen by other students in the class and your teacher.

Step 4
Upload a screenshot of your new poster to your learning journal page.
Remember:
To include your Aurasma account name so that other people can follow you and see your aura.
To click ‘publish live’ and ‘publish’ on your website or your teacher will not be able to see your work.

Appendix D: Student Generated Augmented Reality Poster (Group 2)

Digital Literacy and the Student Experience

The following augmented reality posters were created by students using the Aurasma app, as part of an action research project.

Aurasma Name: [redacted]93

http://socialadvocacy.weebly.com/my-learning-journal

Student generated video of student's definition of digital literacy and answering the question:

1. What do I think I need to know or do to be digitally literate?

Aurasma Name: wanz
http://[redacted].weebly.com/my-learning-journal
Student interview on digital literacy. The student interviewer is asking two questions:

1. What do teachers need to know about digital literacy?
2. How can teachers help students with their digital literacy?

Appendix E: Examples of Student Online Quiz Results (Group 1)

(from the University of Exeter http://as.exeter.ac.uk/cascade/digital-scholars/researcher-resources/quiz/)

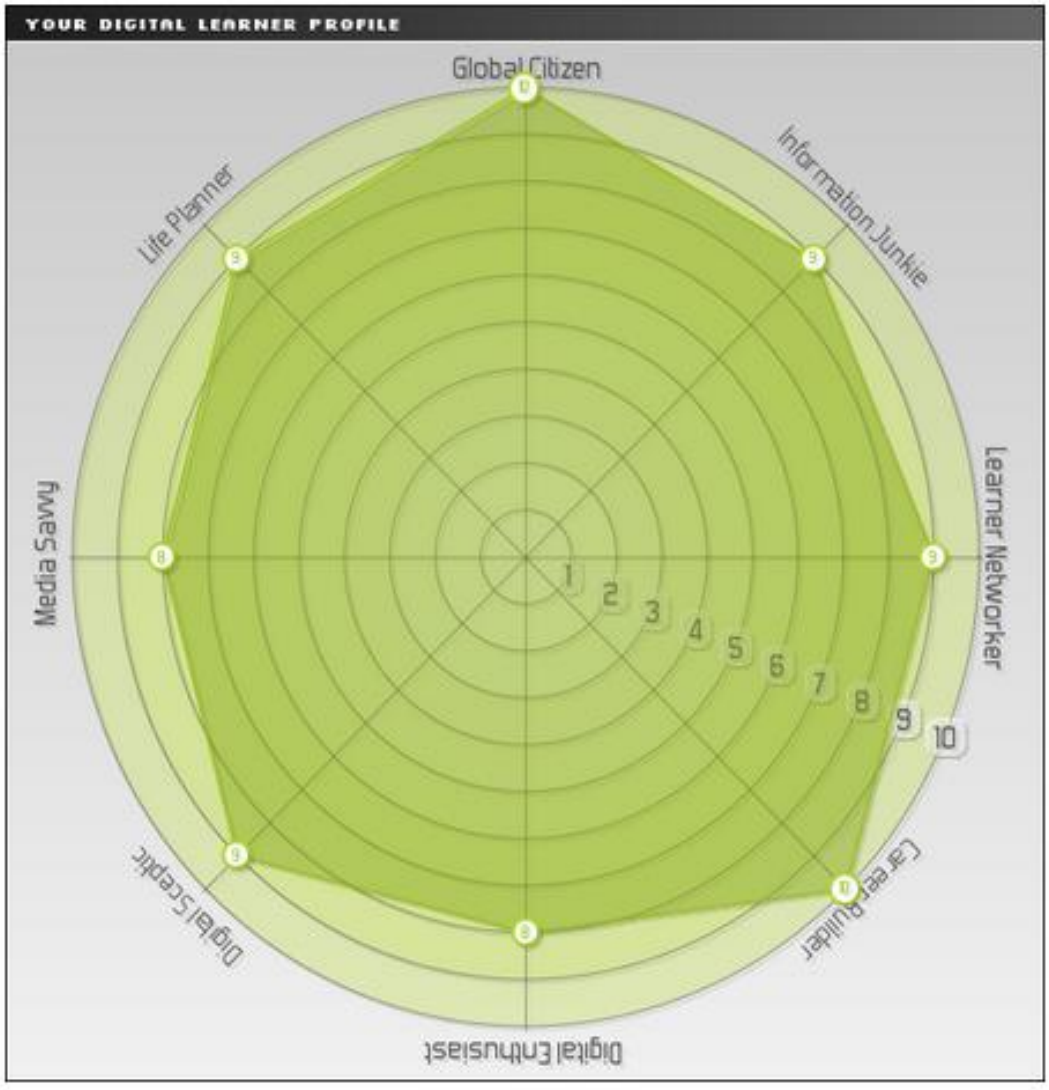
Your Digital Learner Profile

How to read these results

These results show the areas of digital scholarship that you already find valuable (towards the outer edges) and those you have yet to explore in depth. Think about how you can develop the aptitudes you already have using the feedback here.

We include scepticism as a positive quality - good judgement requires a discerning and critical approach to new technologies, as well as confidence in adopting them. Then go back to the questions and look at what other researchers are doing that you have not yet tried.

Elsewhere on this site, our researcher briefing papers and researcher development online module will help to get you started.



Global Citizen Your Score = 10

You use digital technology to connect with like-minded people who you may never meet face to face. You have an international orientation

- ***perhaps you see yourself working for a global company or in an overseas location. You are confident using technology to express your point of view and to organise activities/events.***

Important to your learning experience

- access to reliable high speed networks for skype/video conferencing
- access to ideas and resources from other cultures
- the chance to express your political, national/local or cultural point of view in your learning.

Ways for you to develop your global networking skills further

- consider how your networks can support your studies e.g. connecting with students beyond your course who share your interests, connecting with potential mentors
- contribute to your course as e.g. a course rep, or by working with other students to set up revision groups or address issues you'd like to see changed.

Career Builder Your Score = 10

You expect university to equip you with skills for a digital economy and ICT-literate job market. You take up training wherever it is offered and you probably already have a profile on a professional network, or an online CV.

Important to your learning experience

- opportunities to showcase what you can do with digital technology, such as an e-portfolio or technology-based assessments
- learning activities that demand professional standards of presentation.

Ways for you to develop your digital employability further

- capture evidence of your learning achievements digitally e.g. photos, video and make sure your digital profile reflects these
- hone your job searching skills by registering for jobsearch sites and attending a CV clinic
- ask someone you know for a recommendation or testimonial on your digital profile

Important to your learning experience

- the quality of the University's digital resources, subscriptions to online journals etc
- research-like learning activities that stretch your capacity to find and use relevant information.

Ways for you to develop your information literacy further

- ask subject librarians how you can refine your search strategies
- experiment with different search tools including specialist and advanced google searches
- find your way around the electronic journal databases in your subject area
- make each assignment stand out by including references that were not recommended/on the reading list
- access online tutorials and guidance such as the Virtual Training Suite
- learn how to manage your own information more effectively, for example using reference management software and document management approaches (see our briefing papers on these subjects).

Digital Sceptic Your Score = 9

You have a healthy degree of scepticism about digital technology, and you actively look for opportunities to study away from the computer. You worry about how dependent we have become on technology for our day-to-day life, and you may have concerns about how personal data is used by online systems.

Important to your learning experience

- learning activities that let you use your face-to-face and real-world skills such group discussion and field work
- face-to-face contact with a real human being if you have a problem or issue to discuss
- opportunities to bring your digital skills up to speed if you need to, without feeling left behind.

Ways for you to develop confidence around digital technology

- express your scepticism, but be open to using technology where it can really save time and effort
- work alongside people who are digitally confident and share your different skills
- recognise that no-one can keep up with everything digital, so identify which technologies are really important to your subject, career goals or personal interests
- once you know what you need, look for help – friends and online videos/tutorials are the best place to start but the university provides ICT support and training to everyone.

Media Savvy **Your Score = 8**

You love digital media, whether it's your music collection, photo gallery, videos and podcasts, or the latest apps. You capture photos, video and possibly even audio regularly on your smartphone or laptop, and you know how to share it socially. Design and presentation is important to you and you like your academic work to reflect that.

Important to your learning experience

- access to software for capturing, editing and presenting media
- access to wifi and support for using your personal devices and cloud services on campus
- opportunities to present your work in different formats.

Ways for you to develop your digital media know-how further

- use your creativity in presenting your work, in class and in assignments (make sure you consult with your tutor about this)
- look for training in the use of different media, which may not be directly related to your course
- share apps and videos you have found useful with other students
- look for co-curricular activities such as societies, clubs, volunteering, work placements that can use your interest in digital media
- keep a public portfolio or website of your work
- post a presentation on slideshare or scribd.

Digital Enthusiast **Your Score = 8**

You could not run your life without your smartphone and you are always up to date with the latest devices and apps. You positively enjoy the technical aspects of your course and other students tend to look to you for help with technical issues.

Important to your learning experience

- knowing that the tools and techniques you are taught are cutting edge
- respecting the digital know-how of teaching staff in your department
- being sure that your digital know-how is recognised and can help you to get a better grade.

Ways for you to develop your digital expertise further

- look for more advanced skills courses e.g. those offered to research students
- join online networks related to your subject area or an area of work that interests you and explore how others are using technology
- look for opportunities to mentor other students or even staff with their digital skills
- find ways of sharing expertise with others e.g. through forums, facebook groups or a twitter account.

Appendix F: Data Collection and Analysis Schedule for Three Cycles of Action Research

Research Question	**Cycle**	**No. of participants**
How do students define digital literacy?	One: students defining their understanding of digital literacy by synthesising their definition of digital literacy; providing examples of how they use it; completing a wheel of digital literacy skills and abilities using an online quiz	13
How do students conceptualise digital literacy? Where are the gaps in support for students and teachers?	Two: Students using other students' definitions of digital literacy and examples, to talk about what they think they need to know about digital literacy; students creating a video and augmented reality poster, plus a learning journal to communicate this. Students identifying what teachers need to know about digital literacy and how they can help students to improve their digital literacy.	11
Where are the gaps in support for students and teachers?	Three: Teacher skills audit to identify gaps with teachers asked in survey to identify where they would like more training. Focus group of teachers	36 9

	providing comments on student feedback	

Appendix G: Example Data Analysis Grid (Group 1)

Code	Codes from question: what does digital literacy mean to you	Self-rating
Sylva	Understanding, knowledge, usage of lots of multimedia	6
Feng	Plagiarism	Not done
Ruby	Basic comfort, knowledge, skills, keeping informed, new ideas, critical thinking, creativity, communicate	8
Nicole	interact with every day, very connected to it	5
Jay	Smartphone every day, information, news, hard to avoid, contact with every day, unavoidable, get information anywhere and everywhere	6
Cai	Literacy – ability to use or understand something	7
Amos	Knowledge, space age devices, communicating with friends, research, education related task	Not done
Justin	Writing papers, creating multimedia presentations, posting information about yourself and others online, part of your day to day life,	9
Andre	not really understanding the meaning of it Skills, knowledge, access information, research	5
Nicholas	Knowledge, skills, using in most effective and efficient way, truly understand concept, engage, use online communities and social networks	8
Alicia	search for information, use social network sites, knowledge, skills, broad range of digital devices, smartphone, tablet, desktop, increasingly important, daily lives.	
Eric	Evaluate sources, have basic knowledge, use web browsers, search engines, wikis	5
Joseph	Understanding, skill, network, utilize devices, use a tablet or a new laptop with ease, use a device in an instance, hands-on.	

Appendix H: Online Quiz Response Grid (Group 1)

Respondent Code	Global Citizen	Information Junkie	Learner Networker	Career Builder	Digital Enthusiast	Digital Sceptic	Media Savvy	Life Planner	Average Score
Sylva	4	4	3	5	2	4	5	4	4
Feng	7	7	7	6	8	7	Not provided	8	7
Ruby	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	
Nicole	6	8	2	5	6	9	7	4	6
Jay	6	6	8	7	6	8	5	7	7
Cai	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	
Amos	6	7	5	5	5	6	6	6	6
Justin	8	9	6	7	10	7	10	6	8
Andre	5	7	6	3	1	7	6	6	5
Nicholas	7	1	6	7	6	6	7	1	5
Alicia	8	6	9	9	8	7	10	7	8
Eric	4	4	2	4	7	5	4	7	5
Joseph	10	9	9	10	8	9	8	9	9

Appendix I: Teacher Feedback Sheet on Student Comments

Please read what students have said and then write down your comments on what you have read:

What do teachers need to know about digital literacy?	How can teachers help students with their digital literacy?
teachers should know as much about digital literacy as possible, as they should be as up-to-date as students	exploring new programmes with students, giving them the opportunity to experiment and try new programmes, that students would otherwise never have heard of, help them gain a wider knowledge of the digital world e-safety skills: warning students of cases of cybercrime and teaching them measures to protect themselves, help recommend safety programmes to student's parents a more interactive method in teaching their students
Your comments:	

Appendix J: Teacher Skills Audit Summary

Learning Technologies Training [redacted] 2015

Q1 Please tell us what you teach.

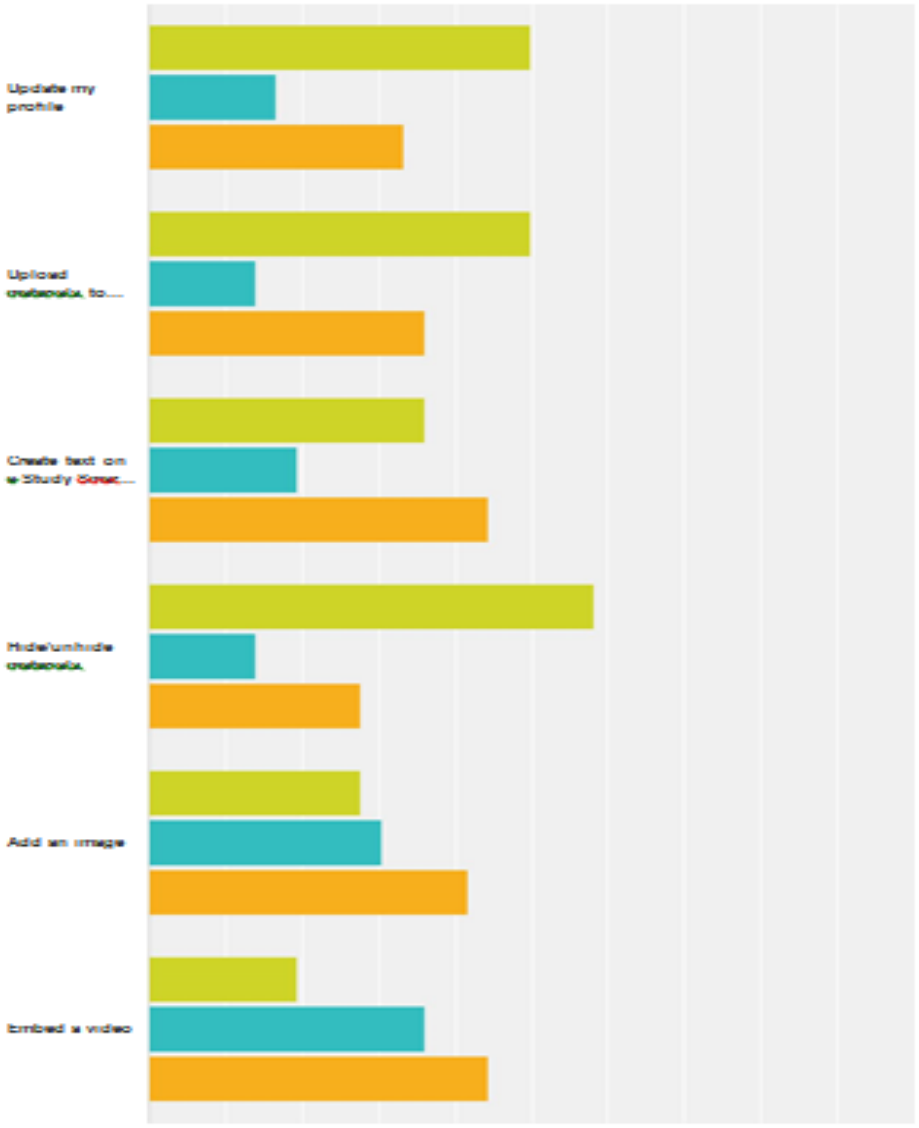
Answered: 36 Skipped: 0

Answer Choices	Responses	
Faculty	100.00%	36
Subjects taught	97.22%	35

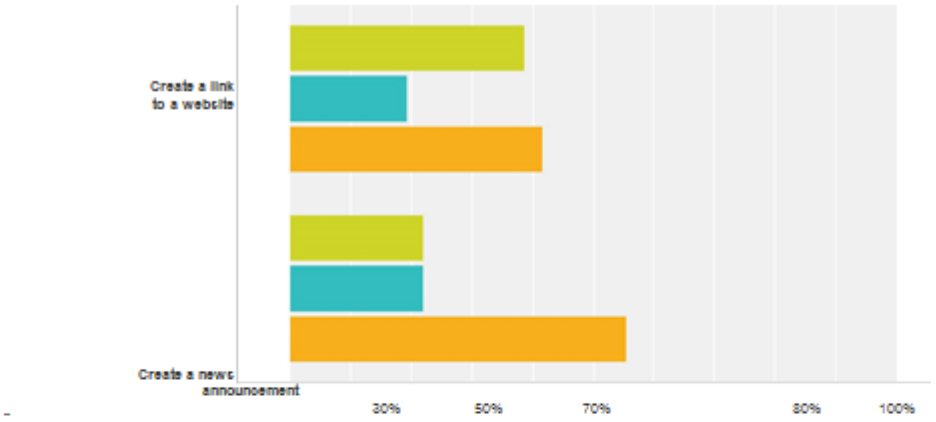
Learning Technologies Training [redacted] 2015

Q3 Study Smart Starter skillsPlease indicate how comfortable you feel about using the following features of Study Smart

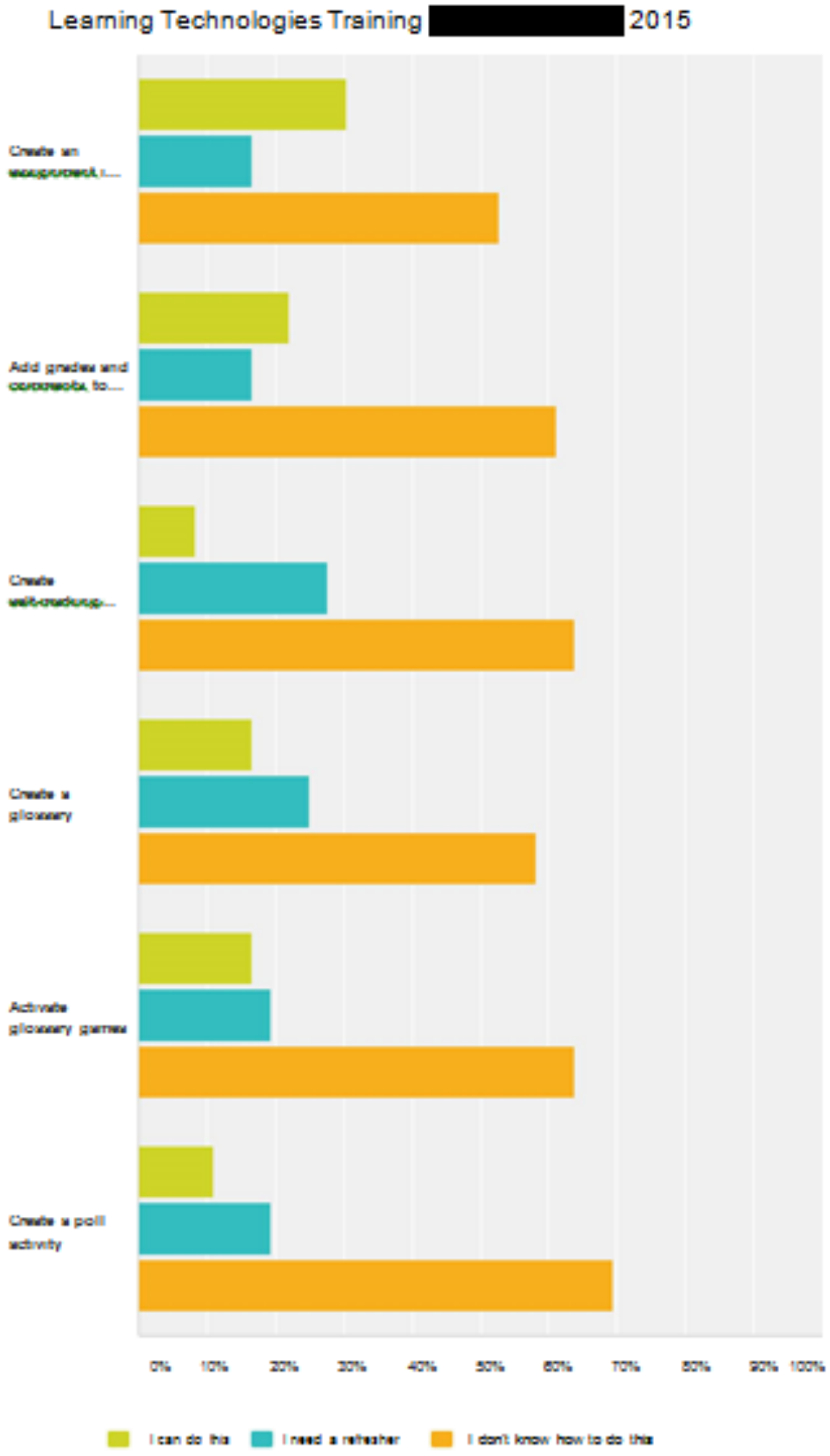
Answered: 38 Skipped: 0



Learning Technologies Training [redacted] 2015



	I can do this	[redacted]		I don't know how to do this	Total
Update my profile	60.00% 18	16.67% 6		33.33% 12	36
Upload materials to share with students (e.g. for review or homework)	50.00% 18	13.89% 5		36.11% 13	36
Create text on a Study Smart page (labels)	38.11% 13	19.44% 7		44.44% 16	36
Hide/unhide materials	58.33% 21	13.89% 5		27.78% 10	36
Add an image	27.78% 10	30.56% 11		41.67% 15	36
Embed a video	19.44% 7	36.11% 13		44.44% 16	36
Create a link to a website	38.89% 14	19.44% 7		41.67% 15	36
Create a news announcement	22.22% 8	22.22% 8		55.56% 20	36


Learning Technologies Training [redacted] 2015
Create an assignment, i...
Add grades and comments to...
Create multi-medium p...
Create a glossary
Activate glossary games
Create a poll activity
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
I can do this
I need a refresher
I don't know how to do this

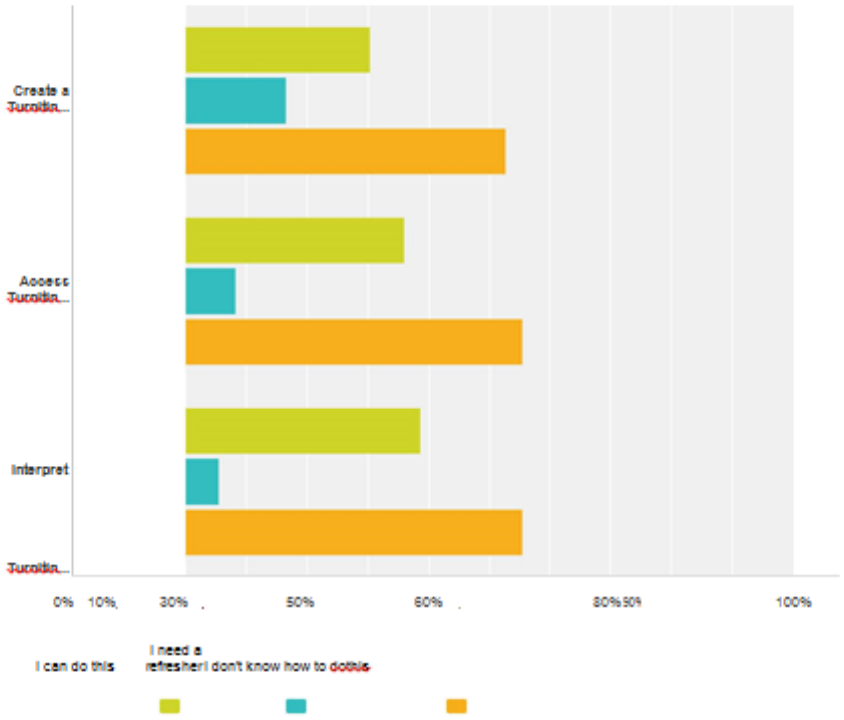
Learning Technologies Training [redacted] 2015

	I can do this	I need a refresher	I don't know how to do this	Total
Create an assignment in Study Smart	30.56% 11	16.67% 6	52.78% 19	36
Add grades and comments to Study Smart Gradebook	22.22% 8	16.67% 6	61.11% 22	36
Create self-marking quizzes	8.33% 3	27.78% 10	63.89% 23	36
Create a glossary	16.67% 6	25.00% 9	58.33% 21	36
Activate glossary games	16.67% 6	19.44% 7	63.89% 23	36
Create a poll activity	11.11% 4	19.44% 7	69.44% 25	36

Learning Technologies Training [redacted] 2015

Q5 TurnitinPlease indicate how comfortable you feel about using these Turnitin features in Study Smart

Answered: 36 Skipped: 0

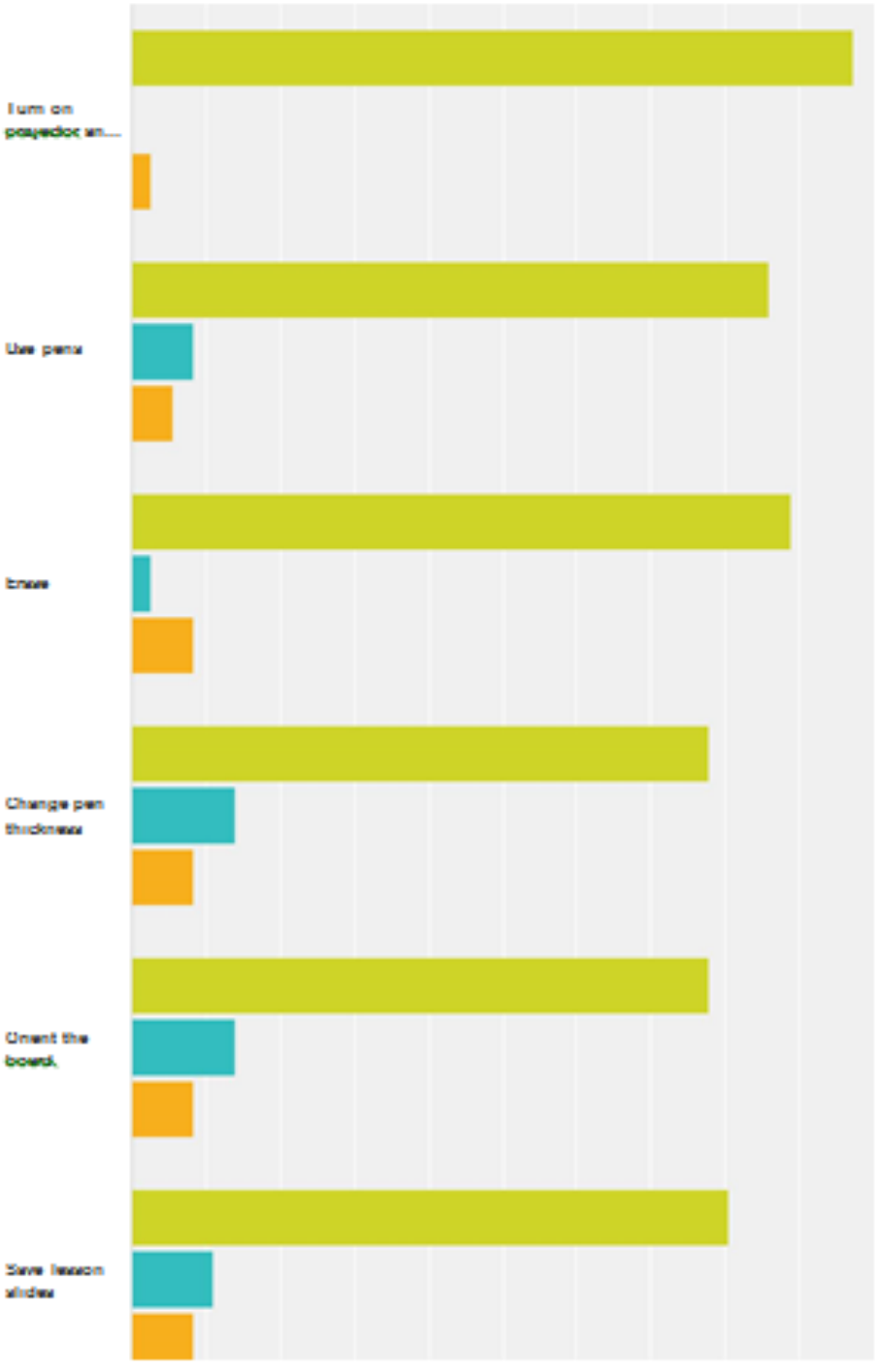


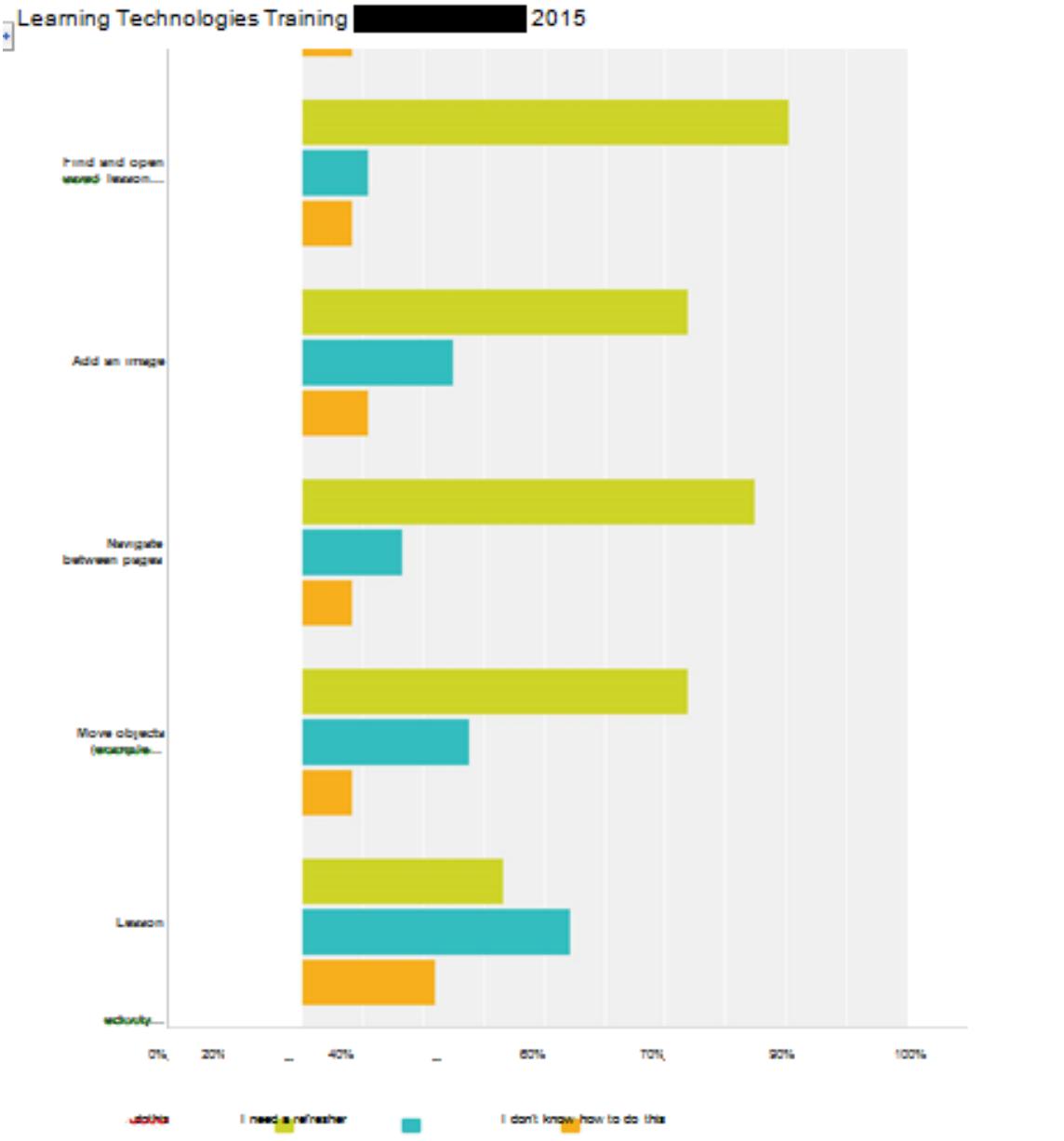
	I can do this	I need a refresher	I don't know how to do this	Total
Create a Turnitin assignment	30.56% 11	16.67% 6	52.78% 19	36
Access Turnitin Originality Reports	36.11% 13	8.33% 3	55.56% 20	36
Interpret Turnitin Originality Reports	38.89% 14	5.56% 2	55.56% 20	36

Learning Technologies Training [redacted] 2015

Q6 Smart Notebook (using the Interactive Whiteboards) Please indicate how comfortable you feel about using these features of IWBs.

Answered: 38 Skipped: 0





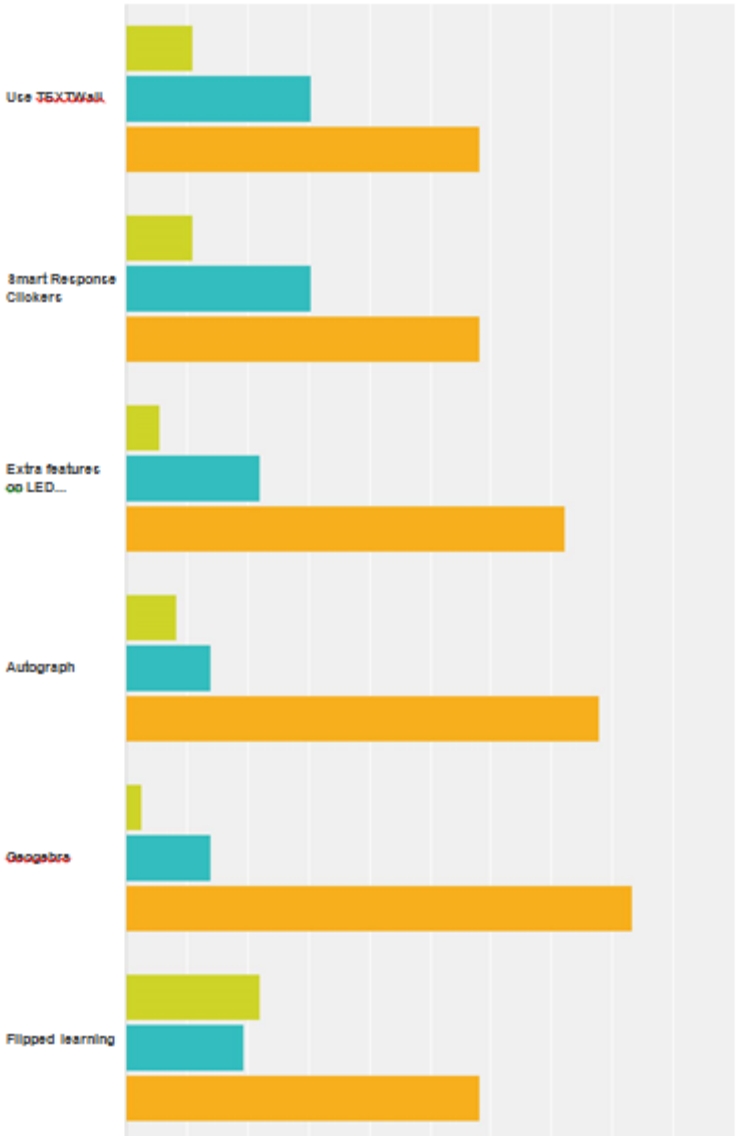
Turn on projector and board		97.22% 35		0.00% 0	2.78% 1	36
Use pens		88.11% 31		8.33% 3	5.56% 2	36

Learning Technologies Training [redacted] 2015

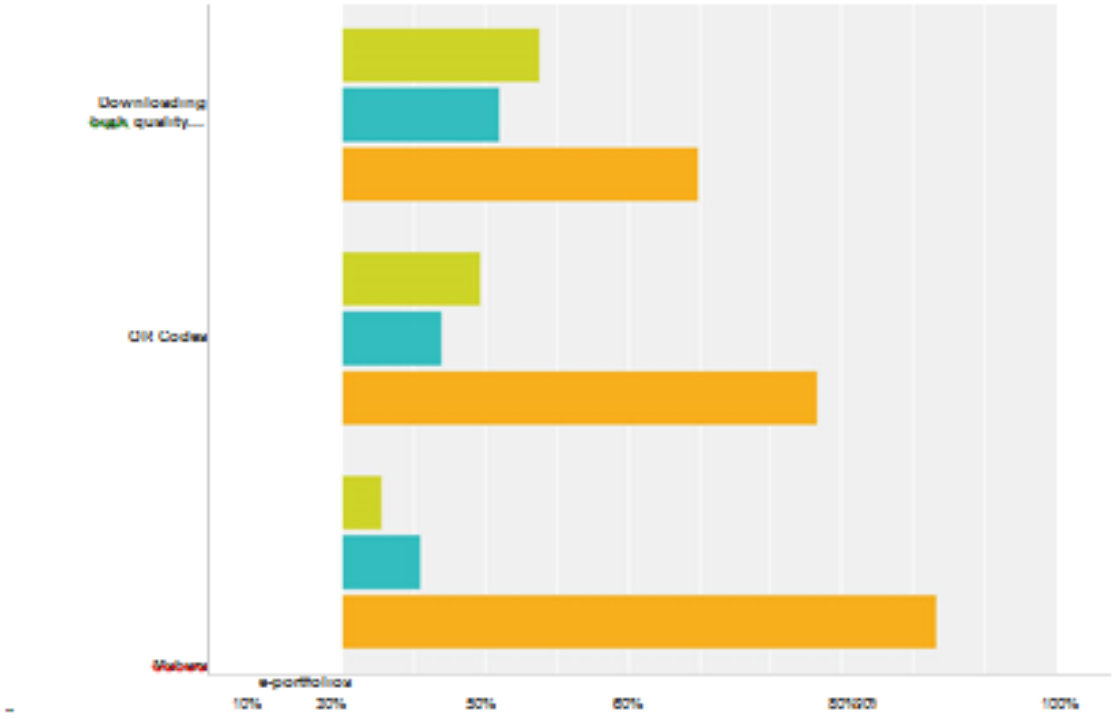
Erase	88.89% 32	2.78% 1	8.33% 3	36
Change pen thickness	77.78% 28	13.89% 5	8.33% 3	36
Orient the board	77.78% 28	13.89% 5	8.33% 3	36
Save lesson slides	80.56% 29	11.11% 4	8.33% 3	36
Find and open saved lesson slides	80.56% 29	11.11% 4	8.33% 3	36
Add an image	63.89% 23	25.00% 9	11.11% 4	36
Navigate between pages	75.00% 27	16.67% 6	8.33% 3	36
Move objects (example matching)	63.89% 23	27.78% 10	8.33% 3	36
Lesson activity toolkit (easy to create games)	33.33% 12	44.44% 16	22.22% 8	36

about using other learning technologies

Answered: 36 Skipped: 0



Learning Technologies Training [redacted] 2015



	I can do this	I need a refresher	I don't know how to do this	Total
Use [redacted]	11.11% 4	30.56% 11	58.33% 21	36
Smart Response Clickers	11.11% 4	30.56% 11	58.33% 21	36
Extra features on LEO Smartboards	5.56% 2	22.22% 8	72.22% 26	36
Autograph	8.33% 3	13.89% 5	77.78% 28	36
Geogebra	2.78% 1	13.89% 5	83.33% 30	36
Flipped learning	22.22% 8	19.44% 7	58.33% 21	36
Downloading high quality images	27.78% 10	22.22% 8	50.00% 18	36
QR Codes	19.44% 7	13.89% 5	66.67% 24	36
Malware e-portfolios	5.56% 2	11.11% 4	83.33% 30	36