The Potential of Online Technologies and Social Media in 21st Century Teacher Professional Development and Practice: A Mixed Methods Study Exploring Teachers' Personal, Professional Development and/ or Classroom Use of Online Technologies in Ireland and the United States of America

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This work is dedicated to my parents Rose and James Hagan (in loving memory of my father) who ignited the fire of curiosity for learning, and supported and inspired me in incredible ways.

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Declaration

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of Doctorate in Education is entirely my own work, and that I have exercised reasonable care to ensure that the work is original, and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

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Table of Contents

Tables:

Figures

Appendices

Abbreviations

3-D	Three-Dimensional
AP	Advanced Placement
BYOD	Bring Your Own Device
BYOT	Bring Your Own Technology
BYOB	Bring Your Own Browser
CMC	Computer Mediated Communication
CCSS	Common Core State Standards
CoL	Community of Learning
CoI	Community of Interest
CoP	Community of Practice
CPD	Continuing Professional Development
DCU	Dublin City University
EFL	English as a Foreign Language
EU	European Union
F2F	Face-to-Face
HMH	Houghton Mifflin Harcourt
ICT	Information and Communications Technology
INTO	Irish National Teachers' Organisation
IP	Intellectual Property
ISTE	International Society for Technology in Education

IWB	Interactive Whiteboard
K-12	Kindergarten to 12th Grade Education
LMS	Learning Management System
Mbps	Megabits per second
MMOC	Massively Multiplayer Online Communities
NETS	National Educational Technology Standards
NWP	National Writing Project
OCL	Online Collaborative Learning
OECD	The Organisation for Economic Co-operation and Development
OT	Online Technologies
OTA	Online Technologies and Activities
PD	Professional Development
PLC	Professional Learning Community
PLN	Professional Learning Network
PreK-12	Pre-Kindergarten to 12th Grade Education
RSS	Rich Site Summary or Really Simple Syndication
SEN	Special Educational Needs
SME	Subject Matter Expert
SPSS	Software for Statistical Analysis
SNS	Social Networking Site
T&L	Teaching and Learning
UGC	User Generated Content
USA	Unites States of America
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VLC	Virtual Learning Community

VLE	Virtual Learning Environment
Web 2.0	Web 2.0 Technologies
Wi-Fi	Wireless Local Area Network (WLAN)
WWW	World-Wide Web

Abstract

This research study employed a mixed methods approach to explore connections between teachers' use of online technologies in their personal lives, for professional development and/ or within classroom practice in Ireland and the USA. In phase 1 of this study, over 80 Irish primary school teachers' experiences of online Continuing Professional Development (CPD) were examined, through the deployment of interviews, focus groups and an online survey. Almost half of the Irish teachers felt that engagement in online CPD impacted positively on classroom practice, and reported having integrated information and communication technologies in their teaching as a direct result of engagement in the online course. Phase 2 of the study examined online technologies usage in the personal lives, professional development and classroom practice of K-12 educators in the USA, through the deployment of an online survey (with 632 respondents) and follow-up interviews. The results revealed low levels of integration of social media in classroom practice, although there were strong correlations between US teachers' use of online technologies and/ or social media in their personal lives, for professional development and within classroom practice. Recommendations that emerged from this study include the need for policies to support (rather than restrict) the use of social media in schools and the need for teacher training on how to effectively infuse online technologies and/ or social media in teaching and learning.

Chapter 1 Introduction

1.1 Introduction

This research study explored connections between teachers' use of online technologies in their personal lives, for professional development and/ or within classroom practice in Ireland and the USA. This first chapter outlines the rationale and intellectual foundations of the thesis. An overview of the research is provided, followed by a summary of the key contributions of this thesis to the field of research. The researcher's personal and professional interest in the chosen field of study is discussed in the genesis section. Finally, the key concepts of Web 2.0 and social media are explained, and the chapter ends with an overview of the seven chapters of this research study.

1.2 Rationale for this Study

The use of online technologies in education has been facilitated by the permeation of the World Wide Web (WWW) and Internet technologies in all aspects of everyday life. These technologies allow for social collaboration "in the cloud", facilitating forums where one can chat, view and post messages and/ or send multiple forms of information and ultimately connect and collaborate with others. The widespread availability of broadband and Wi-Fi, mobile devices including iPads, and the latest iPods, videos, weblogs and podcasts, is influencing the expectations of users, particularly learners in the primary and post-primary sectors. *Digital natives*, or the *Net generation* have grown up immersed in technology, and according to the U.S. Department of Education, (2004) understand the opportunities of the Internet and social media, often better than the teachers who did not grow up with the these technologies.

Anecdotal evidence suggests that teachers and students are adopting social media technologies as a means of communication, collaboration and sharing resources at a phenomenal rate outside school contexts. The permeation of these technologies within educational settings is expected to increase rapidly in the coming years. However, there is little empirical evidence on teachers' perspectives and usage of social media and other online technologies to support their continuing professional development or their classroom practice. Therefore, this research study set out to address this gap by exploring teachers' perceptions, attitudes, and experience of the integration of online technologies, in particular social media, in their personal lives, for professional development, and within classroom practice.

1.3 Intellectual Foundations

The intellectual foundations of this thesis are rooted in the work of George Siemens, particularly: 1) Siemens' (2004) Theory of Connectivism that posits knowledge as being networked and distributed, and that learning is about creating and navigating these networks; and 2) Siemens' Learning Ecology model (2003), that recognises that online environments provide opportunities for promoting and sustaining the creation of learning communities.

Siemens (2008) believes that systemic changes are needed to leverage the transformative potential of connective knowledge and networked learning. Constructivism, social constructivism, and connectivism learning theories herald a theoretical shift from instructor or institution-controlled teaching to learner-centred and learner-controlled education. Online technologies can enable educational institutions and educators to facilitate learning ecosystems, where students can shape their own meaning and connect more meaningfully in the process of content creation and collaboration, and, ultimately, to foster learner-generated knowledge. As a result of this, Siemens (2006, p. 39) contends that there is a need to reflect on how learning has changed and what this means with regard to educators' design of "*the spaces and structures of learning today",* in a world where the physical walls of educational institutions are dissolving and

knowledge is distributed between experts, teachers, learners and the 'Internet of Things' (for example: databases, archives).

The penetration of online technologies in education thus calls for new models of professional development that prepare teachers not only to be subject specialists and curriculum developers, but also to be capable of moderating and motivating learners within distributed online learning environments. Furthermore, future models of learning need to accept and value the range of learning situations where cognitive and social development happens beyond traditional classrooms. Learning can occur anytime, anywhere, at the point of need, through communities of practice and personal learning networks, and also, according to Siemens (2008), through the many informal learning opportunities arising from reading, volunteering, and hobbies. Therefore, the skills required of learners demand more focus on critical and creative literacies; the nature of learning needs to move more towards Mezirow's (2003) concept of transformative learning (challenging frames of mind through dialogue with multiple perspectives); and professional development programmes must focus on the development of critically reflective practitioners, capable of facilitating learning within a distributed, online, learning environment.

1.4 Overview of the Research

This study investigates teachers' usage of online technologies in their personal lives, to support continuing professional development (CPD) and/ or in their classroom practice in Ireland and the United States. A multiphase mixed methods design forms the overarching research design for this research, which was conducted in two phases between 2008 and 2013. Phase 1 (2008-2009) of the research explored Irish primary school teachers' perceptions of online CPD, specifically relating to the immersed online CPD summer programmes initially offered in Ireland in 2007, and their impact on the integration of technology in classroom practice. Phase 2 (2011-2013) of the research examined US K-12 (Kindergarten to 12th Grade) teachers' use of online technologies in their personal lives, for continuing professional development, and in their classroom practice in the US. Please refer to Table 1.1 for an explanation of the different

levels of the US educational system compared to approximate levels in the Irish context. Table 1.2 provides an explanation of US school types (Public, Private, Charter). The study also examined US teachers' attitudes, opinions, confidence and concerns regarding the integration of these new technologies in education. Interviews, a focus group and online surveys comprised the data collection tools. Data analysis included the statistical analysis of quantitative data, and thematic coding of qualitative data, at various stages in the research process.

Table 1.1 Comparative School Levels, Grades and Student Ages of the US and Irish Systems of Education.

US Educational System		Irish Educational System	
Pre-School	Pre-Kindergarten (3-5 years)	***Pre-School***	**Pre-school Year** (3-5 years)
Elementary School	Kindergarten (5-6 years)	***Primary School***	Junior Infants (5-6 years) Senior Infants
	1st Grade (6-7 years)		1st Class (6-7 years)
	2nd Grade (7-8 years)		2nd Class (7-8 years)
	3rd Grade (8-9 years)		3rd Class (8-9 years)
	4th Grade (9-10 years)		4th Class (9-10 years)
	5th Grade (10-11 years)		5th Class (10-11 years)
	6th Grade (11-12 years)		6th Class (11-12 years)
Middle School	7th Grade (12-13 years)	***Second Level School***	1st Year (12-13 years)
	8th Grade (13-14 years)		2nd Year
	9th Grade (14-15 years)		3rd Year (14-15 years) (Junior Certificate)
High School	10th Grade (15-16 years)		4th Year (15-16 years) (Transition Year Option)
	11th Grade (16-17 years)		5th Year (16-17 years)
	12th Grade (17-18 years)		6th Year (17-18 years) (Leaving Certificate)

~~***Pre-school***~~	~~Pre-Kindergarten (3-5 years)~~	~~***Pre-school***~~	~~Pre-school Year(3-5 years)~~
~~***Elementary School***~~	~~Kindergarten (5-6 years)~~	~~***Primary School***~~	~~Junior Infants (5-6 years)~~ ~~Senior Infants~~
	~~1st Grade (6-7 years)~~		~~1st Class (6-7 years)~~
	~~2nd Grade (7-8 years)~~		~~2nd Class (7-8 years)~~
	~~3rd Grade (8-9 years)~~		~~3rd Class (8-9 years)~~
	~~4th Grade (9-10 years)~~		~~4th Class (9-10 years)~~
	~~5th Grade (10-11 years)~~		~~5th Class (10-11 years)~~
	~~6th Grade (11-12 years)~~		~~6th Class (11-12 years)~~
~~***Middle School***~~	~~7th Grade (12-13 years)~~	~~***Second Level School***~~	~~1st Year (12-13 years)~~
	~~8th Grade (13-14 years)~~		~~2nd Year~~
	~~9th Grade (14-15 years)~~		~~3rd Year(14-15 years)~~ ~~(Junior Certificate)~~
~~***High School***~~	~~10th Grade (15-16 years)~~		~~4th Year (15-16 years)~~ ~~(Transition Year Option)~~
	~~11th Grade (16-17 years)~~		~~5th Year (16-17 years)~~
	~~12th Grade (17-18 years)~~		~~6th Year(17-18 years)~~ ~~(Leaving Certificate)~~

Table 1.2 US School Types: Public, Private, Charter.

School Type	Description
US Public Schools	Are funded for by the state through tax revenues.
US Private Schools	Operate independently of the state and fund their expenses by charging parents tuition fees.
US Charter Schools	Receive funding from the State as well as private donations. They are subject to some of the rules and regulations pertaining to public schools, but have more flexibility than traditional public schools in terms of their *charter*. They are expected to produce certain results, set forth in each school's charter. Parents send their children to charter

schools by choice.

1.5 Contributions of this Thesis

This is the first large scale study which focuses on the analysis of online technologies usage within teachers' personal lives, professional development and/ or classroom practice across the K-12 sector. This study provides a general overview of the diversity and frequency of online technologies and social media usage across the three domains of educators' personal lives, professional development and classroom practice. This study further contributes to the body of research on teachers' usage of online technologies within professional development and classroom practice, by offering new information about the teachers' use of online and social media technologies in K-12 education, specifically related to Internet access, gender, age and years of teaching experience, attitudes, confidence and teaching styles. Furthermore, this is examined through the lens of school level (elementary, middle and high school); type of school (public, private, charter) and school designation (disadvantaged, special educational needs, *Title 1*). *Title 1* schools focus on improving academic achievement of disadvantaged students.

1.6 Researcher Context and Genesis of Thesis

Having graduated from St Patrick's College of Education, I taught at all levels of primary school over a period of ten years (both mainstream and special educational needs schools). Over that time, I pursued a Masters in Educational Leadership at University College Dublin. I also worked in educational publishing companies at Vivendi Universal and Riverdeep. My current role is Digital Publisher at Houghton Mifflin Harcourt (HMH) where I am responsible for HMH's Digital product design and development including the areas of learning design, creative and interactive design, user experience, software development and quality assurance, working with a global partner network of thought leaders and subject matter experts (SMEs), to create leading edge, pedagogically sound, innovative and engaging educational products for 21st Century teaching and learning. I believe that the potential of digital learning is infinite and it's inherently motivating to be involved in shaping the next

generation of teachers' and students' educational experiences. I chose the Doctorate in Education program, as it constituted the perfect fit for me based on my education and professional practice.

My research interests have focussed on educational technology for students and teachers in K-12 education, combating the digital divide, online continuing professional development (CPD) for teachers, and online collaboration and learning environments for K-12 teachers and students. To begin with, I was interested in the implications of the new wave of technologies, particularly Web 2.0 and social media, for teachers' professional development and classroom practice. Then, I became particularly interested in exploring and examining if teachers' personal and professional use of social media was associated with integration of Web 2.0 and social media in educators' classroom practice. This ultimately culminated in the design and implementation of the research study undertaken for my doctoral thesis.

1.7 Key Concepts Associated with Social Media and Web 2.0

Throughout this thesis, the terms '*social media*' and '*Web 2.0*' appear frequently, and thus, a critical review of these concepts is undertaken here. Levin (2013, p. 11) perhaps offers one of the most useful distinctions between these two concepts, when he refers to social media as a '*cultural phenomenon, enhancing interpersonal communication and changing the nature of relationship between the individual and a society'*, and Web 2.0 as the '*technological basis of social media'*.

Web 2.0 technologies have advanced from Web 1.0, essentially a broadcast medium, by enabling users to not only read web content but also to connect, share and collaborate with others through a range of online tools. Web 2.0 according to Wu Song (2010) can be seen as facilitating interactivity and enabling user-generated content (UGC) and comments. This concept of Web 2.0 users as co-creators of content such as blogs, wikis, and SNSs denotes the '*democratic*' nature of these technologies. Blank and Reisdorf (2012) attest that Web 2.0 has moved the web from a place where users viewed content to a place

where they are empowered to contribute content via blogs, customer reviews, etc. and become producers of content alongside the organisations (newspapers, book publishers, music labels, film studios, radio, and television networks) who held this space previously. According to Blank and Reisdorf (2012), this change to individuals producing and distributing underpins the significance of Web 2.0. Hicks and Graber (2010) point to five main characteristics of Web 2.0: collaboration, creativity, conversation, community and control. They claim that the participatory, democratic and open nature of Web 2.0 enables users to collaborate, and to creatively use and reuse content in new ways. Web 2.0 changes users from passive recipients of information to active consumers and producers with the power to direct the future of learning.

According to Kaplan and Haenlein (2010, p. 61), social media *"is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content."* Social media consists of a number of distinct but common technologies. These include social networking sites, wikis and blogs, among others. Kaplan and Haenlein describe six classifications of social media: 1) collaborative projects such as wikis and social bookmarking tools which facilitate user generated content (UGC), for example, *delicious*; 2) blogs comprising personal web pages allowing for interaction and comments from others, for example, *Twitter*; 3) content communities which facilitate the sharing of media among users, for example photos via *Flickr*, videos via *YouTube*, and presentations via *Slideshare*; 4) social networking sites that allow users to connect by creating personal profiles, inviting "*friends*" to access these profiles, and send e-mails and instant messages to each other, for example, *Facebook*; 5) virtual game worlds – 3-D (three-dimensional) environments where users through their personalised avatars interact with each other as in real life, for example, *World of Warcraft* and; 6) virtual social worlds, for example *Second Life* which allow users to live a virtual life and choose their behavior more freely. Kaplan and Haenlein (2010) further discuss the social processes of *self-presentation* and *self-disclosure* in their classification of social media. They also discuss three levels of *social presence* as low (blogs), medium (content

communities and SNS, such as *Facebook*) and high (virtual social worlds and game worlds).

Boyd and Ellison (2007) define social networking sites as web-based services that allow individuals to: 1) construct a public or semi-public profile within a bounded system; 2) articulate a list of other users with whom they share a connection, and; 3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site. Social networking sites such as *Facebook* and *LinkedIn*, allow for social discussion, collaboration and annotation through the provision of forums and tools that facilitate chatting, posting, rating, sharing and other forms of individual and collective interaction. A Weblog or blog is an online journal where users can discuss a particular topic or focus. Blogs allow users to post personal content, to comment on and connect to other media sites, and to make observations about other users' posts. (Du and Wagner 2006) Twitter can be considered as a micro blogging service, that limits posts to 160 characters. According to Java *et al.* (2007), the average blogger may update every few days whereas the average micro blogger will update several times a day. Wikis allow for collaborative editing and sharing of information; for example, *Wikipedia* (for further definition and listing of specific social media technologies, please refer to Appendix A).

In conclusion, Moran, Seaman, and Tinti-Kane (2011, p. 4) accept that social media is a 'hazy' term encompassing "*user created, user controlled, flexible, democratic, and both very transparent and very not*". It is also evident from this examination of the literature that the terms 'social media' and 'Web 2.0' are used separately, together and interchangeably within research studies (Gruzd, Staves and Wilk, 2012; Hemmi, Bayne and Land, 2009; Kaplan and Haenline, 2010). For the purposes of clarity in this research, the term 'social media' refers to common social media applications (social networking sites, wikis, and blogs, etc.). The term 'Web 2.0' is considered to be the technologies underpinning and enabling social media, and the term 'online technologies' is considered to be inclusive of all online technologies, including Web 2.0 enabled

technologies, social media, and other media (e-mail) or online learning management platforms (such as *Moodle*).

1.8 Overview of Chapters

This section outlines the structure of the thesis and describes in summary the content and organisation of each of the chapters.

1.8.1 Chapter 1

This chapter provides the reader with an introduction and background to the study, an overview of the research, its contributions to the broader research body, the genesis of the thesis and some background information on the researcher, as well as an explanation of the key concepts of Web 2.0 and social media.

1.8.2 Chapter 2

This literature review presents and critiques the existing research on online technologies usage in the personal lives, professional development activities and classroom practice of primary and second level teachers. The three landscapes of online technologies usage, namely, teachers' personal lives, professional development and classroom practice, are discussed along with the eight themes of: 1) access to and infrastructure in online technologies integration; 2) trends in types of online technologies being used; 3) trends in models of online technologies integration; 4) key influences on teachers' integration of online technologies; 5) the key tensions that impact on teachers integration of online technologies; 6) key barriers to teachers' integration of online technologies; 7) claims regarding the potential or need for integration of online technologies, and finally; 8) standards in online technologies integration are discussed based on the available research studies and literature.

1.8.3 Chapter 3

This research design chapter begins with an examination of the post-positivist philosophical underpinnings of the research. It describes and justifies the multiphase mixed methods approach used, which took place between 2008 and

2013. Data collection tools (interviews, focus group and online survey) are detailed. The data analysis process including statistical analysis of quantitative data, and thematic coding of qualitative data, is presented.

1.8.4 Chapter 4

Chapter 4 presents the first phase of the research, an exploratory sequential mixed methods research design, exploring online continuing professional development (CPD) programmes on offer to Irish primary school teachers since 2007, and using interviews, a focus group and online survey data collection instruments. Findings for this phase are presented in terms of the research questions under the following themes: key factors influencing teachers' engagement in online CPD, barriers to teachers' engagement in online CPD, influence of online CPD on teachers' classroom practice and the subsequent integration of ICTs in curriculum delivery, and the perceived positive and negative implication of online CPD. Key outcomes are discussed in relation to policy formation; teachers' skills; and structural issues for online course providers and online course design issues for courser providers.

1.8.5 Chapter 5

Chapter 5 presents the findings of phase 2, an explanatory sequential mixed methods research design conducted with K-12 US teachers. This phase examined teachers' use of online technologies in their personal lives, their use of social media for professional development and classroom practice, using an online survey and follow up interviews as the data collection instruments. The findings are presented under the following themes: access to online technologies in US schools and classrooms; educators' online technologies/ activities use in their personal lives, for professional development and classroom practice; educators' teaching and learning style; educators' beliefs on the potential of social media in education; educators' confidence in using these technologies; and barriers to the use of online technologies in K-12 education.

1.8.6 Chapter 6

This chapter provides the analysis of the quantitative data (*N*=632) for phase 2 of this research project. It begins by explaining how the various scales were isolated, and the correlations and other tests undertaken to identify relationships between dependent and independent variables arising. These included: educator use of online technologies/ activities in their personal lives, professional development and classroom practice; gender, age, years of teaching experience, attitudes to the use of social media for educational purposes, school level (elementary, middle and high school), school type (public private, charter), school designation (disadvantaged, special educational needs, *Title 1)* and teaching styles of educators in relation to social media use. The discussion ends with an overview of the findings from the micro study carried out on the minority of educators who reported that social media was not blocked in their schools (110 schools or 17% of the total sample) to determine if there were significant differences between the dependent and independent variables examined in the full sample.

1.8.7 Chapter 7

This chapter presents the conclusions and recommendation of the study.

Chapter 2 Literature Review

2.1 Introduction

This mixed methods study set out to explore primary and second level teachers'online technologies usage in their personal lives, for their professional development and in their classroom practice. It also explores teachers' perceptions of, attitudes to, and concerns around integrating social media in educational practice. Therefore, the literature review focuses on examining online technologies usage at primary and second levels of education across the

United States and Europe with specific reference to research that examines how teachers engage with social media for personal use, for continuing professional development, and to support teaching and learning processes. The discussion opens with an explanation of the literature review methodology, followed by a critical review of the literature.

2.2 Literature Review Methodology

The literature review was conducted over a period of three years, systematically searching the extensive and expansive databases of journals and articles, available through Dublin City University (DCU) library resources, including; Academic Search Complete, Cambridge Journals Online, Emerald Management, ERIC International, ESRI Report, OECD Library, Professional Development Collection, Sage Publications, Science Direct, JSTOR, Wiley and Wilson Omnifile. Relevant theses and dissertations were also reviewed from Oscail, DCU and other libraries. Government policy and initiatives in the United States, and Europe were examined, through a review of governmental websites and publications from organisations, such as the Organisation for Economic Co-operation and Development (OECD), the International organisation helping governments tackle economic, social and governance challenges of a globalised economy (www.oecd.org), the United Nations, and the European Commission. In addition, publications from networks such as the International Society for Technology in Education (ISTE) were examined. Google Scholar searches were also performed. Search words and phrases used included 'online technologies', 'online learning in K-12', 'online learning in Higher Education', 'social media', 'social media in education', 'Web 2.0', 'social networking', 'social networking sites in education', etc. The ''*snowball*'' method of using the most recent works to find relevant articles cited in them provided additional direction on studies, theories or approaches in social media usage that were perhaps of more relevance.

On initial examination of the literature, it was evident that there were many (mainly small-scale) studies exploring the impact of specific Web 2.0 and social media tools integration in classrooms and on student learning. Other

studies focused on examining pre-service training and the continuing professional development initiatives aimed at supporting the integration of these and later technologies in classroom practice. It was therefore necessary to develop a thematic framework to support the review and analysis of the diversity of research projects and associated contexts emerging from the literature. The thematic framework that emerged consisted of eight key themes to be explored during the literature review process, as illustrated in the *Figure 2.1*.

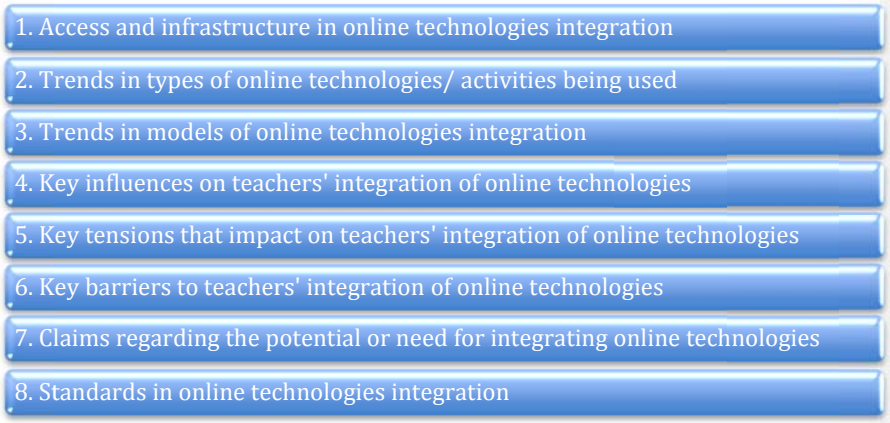


Figure 2.1: Themes Examined for the Literature Review

Some of these themes were identified at the outset through an analysis and a breakdown of the overarching research question. However, overall these themes evolved and were articulated through a cyclical and dialectical process of examining what was emerging from the literature, and further refining these themes as the process continued.

These eight themes were examined within three contexts, namely, teachers' use of online technologies (such as social media) in their personal life, in professional development and in classroom practice, as illustrated in *Figure 2.2*.

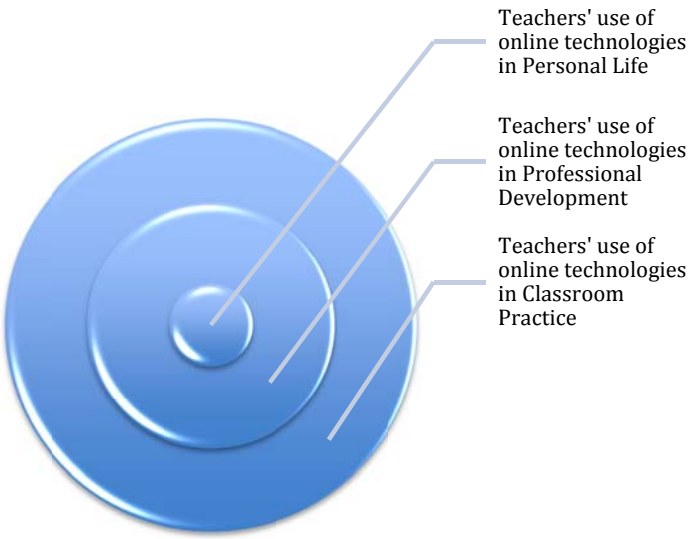


Figure 2.2: Contexts Examined for the Literature Review

The presentation and critique of the literature begins by elaborating on the landscapes underpinning the three aforementioned contexts. It then ensues with a critical review of the literature structured according to the eight themes highlighted in *Figure 2.1*, with detail on each of the three contexts discussed within each section, where applicable.

2.3 Exploring the Landscapes: Technology Usage in Teachers' Personal Lives, Professional Development and Classroom Practice

This section focuses on exploring the broader context of technology integration within the three areas under examination in this literature review, namely, teachers' personal lives, professional development and classroom practice. The intention here is to provide a general sense of the landscapes within which online technologies have been, or are expected to be infused.

2.3.1 Landscape 1: Teachers' Use of Online Technologies in Personal Lives

According to Redecker, Ala-Mutka, and Punie (2010, p. 3), the Internet is affecting the personal and professional lives of EU citizens by '*offering them an increasing range of opportunities for accessing information, gaining and exchanging knowledge and realizing their personal learning goals*'. Within the Digital Agenda for Europe, the European Commission set itself the goal of achieving a number of ICT targets by 2020, for example, 75% of EU citizens being regular Internet users by 2015. (European Commission 2013b) According to the results of the Eurostat survey on *Information Society Statistics* in EU-27 households, Internet usage is increasing across the European Union; 73% of citizens had access to, and use the Internet; this figure demonstrates a 24% increase since the 2006 Eurostat survey. Internet usage has also penetrated everyday life according to Seybery (2012), 56% of individuals in the 2011 Eurostat survey used the Internet every day or almost every day, while 68% used the Internet at least once a week.

The ability to use ICTs (particularly, the World Wide Web) efficiently and effectively is perceived as improving competitiveness in an increasingly globalised market (Tinio 2003), and providing access to information and opportunities that lead to better quality of life. In the Eurostat (2011) survey, younger people aged 16-24 years were shown to be regular Internet users (91%) in comparison to 40% at the 55-74 years age group; a nod towards possible divisions along the lines of digital natives (those who have grown up with online technologies) and digital immigrants (those who are late adopters of online technologies). Furthermore, twice as many individuals with high formal education used the Internet than those with a low level of education; suggesting a need for more training among those with lower levels of education. The differences between men and women were relatively small with 70% of men and 65% of women using the Internet regularly. Finally, Internet access among EU member states was shown to vary considerably, ranging from over 90% in the Netherlands, Luxembourg, Sweden, and Denmark; to below 50% in Bulgaria, Romania and Greece; this presents issues for the integration and use of Internet within those countries with low levels of Internet access. (Seabury 2012)

The Eurostat 2011 survey also revealed that nearly 80% of Internet users accessed the Internet to search for information about goods and services. More than half read online news (56%), 54% used services related to travel, or looked for health related information (54%). Interestingly, a significant share of Internet users (40%) searched for information about education and training. Regarding social networks, more than half of Internet users (53%) participated in social networks. The proportion of Internet users who participated in professional networks was at a much lower level, namely, 10%. A significant share of Internet users made use of new learning opportunities: More than half (54%) consulted wikis on subjects of interest. One in five Internet users stated that they read and posted opinions on civic or political issues, while one in ten Internet users took part in online consultations or voting.

And what of teachers' use of technologies in their personal lives? Purcell, Heaps, Buchanan and Friedrich (2013) in their study of US Advanced Placement (AP) and National Writing Project (NWP) teachers found that US teachers outpace the general adult population in almost all measures of personal technology use. [The comparative US adult statistics for social media use are referenced in Pew (2012) *What Internet Users Do Online*.] A total of 2,462 middle and high school teachers in the U.S., Puerto Rico and the U.S. Virgin Islands, participated in the Purcell *et al.* (2013) survey. More teachers own a cell phone (94%), slightly higher than the national figure of 88% for all US adults□□Of these teachers, 58% have a smartphone, compared with 45% of all adults□ Teachers owning a laptop computer accounted for 93% versus 61% of all adults□ Tablet owners comprised 39% versus 24% of all adults□□ Forty seven percent own an e-book reader versus 19% of all adults, 78% use social networking sites such as *Facebook*, *LinkedIn* or *Google+*, compared with 69% of adult Internet users and 59% of all adults□ Over a quarter (26%) use *Twitter* versus 16% of adult Internet users and 14% of all adults. This study demonstrates that US teachers are higher than average technology users in their personal lives. No comparative figures are available within the literature for EU teachers' use of technology in their personal lives.

2.3.2 Landscape 2: Teachers' Use of Online Technologies in Professional Development

The Irish Primary School Curriculum holds that it is '*the quality of teaching more than anything else that determines the success of the child's learning and development in school'*. (Government of Ireland 1999, p. 20) Professional development is the process by which teachers develop the skills, knowledge, and values-base to become effective in the classroom. According to BECTA (2004), the professional development of teachers should be on-going and enduring, in response to an ever-changing environment. Thus, the concept of Continuing Professional Development (CPD) is promoted, where teachers engage in lifelong learning and reflective practice, through exposure to "*a new set of experiences, skills, resources, and knowledge that will support them as they implement the ideas they have studied in the field."* (Holmes, Signer, and MacLeod 2010, p. 76) Life long learning and digital skills are fast becoming a requirement for most jobs in this information society. Teachers themselves need the requisite digital skills to support their students in this area. Ala-Muta *et al.* (2008a) suggest that digital skills need to be addressed not only as a separate subject area or discipline but also infused in teaching in all subjects. They further comment that '*Teachers need to be equipped with the digital competence themselves, in order to support this process*.' (Ala-Muta *et al*. 2008a, p.2)

One way of contributing to high quality teaching and learning in this information age is through online professional development of teachers. A 2013 report on *US Digital Marketing Trends in the Education Market* shows that nearly all teachers (97%) use one or more website types to research and access content for use in their classrooms, and furthermore that 74% of teachers have engaged in an online professional development course. (MDR 2013) In Purcell *et al.*'s 2013 report *How Teachers Are Using Technology at Home and in Their Classrooms*, US teachers were asked about the impact of the Internet and digital tools. They reported that the Internet has a "major impact" on their ability to: access content and resources for their teaching (92%); share ideas with other educators (69%); interact with parents (67%); enable interaction with their students (57%). (Purcell *et al*. 2013, p. 52) Therefore, exposure to, and training

on the integration of online technologies within teacher professional development is necessary.

Although online teaching and learning resources and teacher networks are widely available in Europe, they are a relatively new way for teachers to engage in professional development, and only a minority of these opportunities are used by schools. The European Commission's (2013a) *Survey of Schools: ICT in Education (Benchmarking Access, Use and Attitudes to Technology in Europe's Schools)* highlighted that 70% of EU students are taught by teachers who have engaged in learning about ICT in their own time. However, this report also revealed that teacher training in ICT for teaching and learning is rarely compulsory - only 25-30% of students are taught by teachers for whom ICT training is compulsory. Furthermore, the report stressed the need for investment in teacher professional development in order to nurture digitally confident and supportive students. Interestingly, this study also pointed to a causal link between teachers' personal confidence in the use of ICT, their participation in professional development and the integration of technology-based activities within classroom practice.

> The more teachers are confident in using ICT, the more they participate in professional development and spend time on such training, and the more they report frequent ICT-based activities during lessons across all grades. (European Commission 2013a, p.10)

Three common models for online course delivery are referenced by Picciano and Seaman (2011) in The Sloan Report. These models are applicable to CPD delivery: face-to-face CPD (courses organised at a particular location and with a defined time - offline), blended CPD (comprising face-to-face and blended learning) and online CPD (a course delivered purely via the Internet where no face-to-face contact is made). Face-to-face programmes limit access to those who can attend at a fixed place and time, while online or blended learning facilitates remote audiences. Singh (2003), a strong proponent of blended courses, stated that early online courses focussed on presenting classroom-based instructional content on the Internet, typically books-on-screen. The realisation that one mode of instructional design would not provide sufficient choices,

engagement, or the degree of social contact needed to facilitate successful learning led to the next generation of online learning programmes for teachers where course designers used a blended learning approach. King (2002) highlighted the potential of blended online courses for teacher education and found that technical difficulties experienced were compensated for by face-to-face communication and the inconvenience of travelling to classes was compensated for by anytime, anywhere online accessibility, and convenience.

The benefits of online CPD discussed in the literature include convenience, access to online learning communities, and 'any time, anywhere' access to facilitate teachers' schedules and preferences. Other advantages of online CPD include its capacity to overcome geographical issues (Sun, Lin and Yu 2007; Lauer, Stoutemyer and Van Buhler 2005; Yang and Liu 2004), issues associated with the digital divide in developing countries (Tinio 2003), reducing professional isolation, support for unlimited numbers of users, and more opportunities for collaboration. (Sherbon and Kish 2005) Roskos, Jarosewich, Lenhart and Collins, (2007) predicted that online CPD would become more prevalent and cost effective than face-to-face options.

Limitations of online or blended models of CPD included challenges for the teacher in following and facilitating both online and face-to-face sessions, and difficulties in sustaining and moderating online communities of learners. (Rovai 2007) Recommendations regarding online course design and delivery in teacher professional development provided in BECTA's 2004 research review included: online CPD that is tailored to subject-specific needs and pedagogical skills, provision of online and technical support, collaborative activities for teachers, access to computers for teachers, time provided for teachers to gain new skills and experiment with curriculum integration and finally, senior management support for the infusion of technology.

2.3.3 Landscape 3: Teachers' Use of Online Technologies in Classroom Practice

Technological optimists claim '*the availability of technology in education will automatically change teaching processes, learning processes and learning*

outcomes'. (Joches, Van Merrienboer and Koper 2004, p. 1) ICT is recognised as a key enabler of innovation and creativity in education and training and learning in general. Using computers and mobile technologies for education and training is a rapidly growing trend in all sectors, largely because of the penetration of the Internet and World Wide Web. Picciano and Seaman's 2009 report *K-12 Online Learning: A Survey of U.S. School District Administrators* reported that the number of students enrolled in online courses increased by 47 percent (from 700,000 to 1,030,000) between 2005 and 2008. This trend indicates that online learning in K-12 education is set to grow significantly in the coming years. District administrators within this study reported that online learning is meeting the needs of students including those requiring extra help and students in credit recovery as well as those in rural areas where access to particular kinds of courses would otherwise be limited. In excess of 6.1 million US College students attended at least one online course in fall semester 2010. (Moran, Seaman, and Tinti-Kane 2011)

Lynde (2012) surveyed approximately 3,150 public school districts in an attempt to substantiate the growing anecdotal evidence that district-level online learning is increasing, 476 districts responded. Respondents (67%) reported that they coordinated or provided online learning options for their students. Therefore, online provision in the US currently appears to increase with school level. Districts reporting offering online options for elementary students amounted to 19%, 41% in the middle grades, 82% at high school level. (Lynde 2012) This demonstrates an increase in online learning provision from the U.S. Department of Education's National Center for Education Statistics (NCES) of the previous year where 55 percent of school districts had enrolled students in distance education courses. (Queen, Laurie and Coopersmith 2011)

So, what does this mean for teachers' use or integration of online technologies in the classroom? According to Ala-Mutka, Punie and Redecker (2008a), despite the uptake on technology in education, ICT has not had a transformative impact on teaching and learning. Kampylis, Bocconi, and Punie (2012) concur that the full potential of ICT has not been achieved. The impact of ICT on students' learning is very much dependent on teaching approaches.

Better skills result when student-centred guidance, group work, and inquiry projects are used. (Law *et al*. 2008, cited in Ala-Muta, Punie, and Redecker 2008b) In *Disrupting Class: How Innovation Will Change the Way the World Learns*, Christensen, Horn, and Johnson (2011) also call for the use of online technology to facilitate more student-centred and individualised instruction. The authors predict that in 2016, 25 percent of all US high school courses will be online, moving to 50 percent in 2019. Furthermore, the permeation of social media technologies within educational settings is expected to increase rapidly in the coming years, which, according to Morgan (2012), highlights the need for teachers to engage with students around the use of Web 2.0 tools beyond the classroom and to model effective use of these in class. Therefore, the meaningful integration of technology in the landscape of classroom practice will necessitate teacher professional development courses that enable teachers to promote technology-enabled, learner-centred, transformative learning opportunities and experiences.

2.4 Thematic Framework Emergent from the Literature

The following eight themes emerged from the review of the literature and are discussed in relation to the three contexts of use; teachers' personal use of online technologies, their engagement with online technologies within professional development and teachers' use of online technologies in their classroom practice.

The eight key themes are:

1. Access and infrastructure in online technologies integration
2. Trends in types of online technologies/ activities being used
3. Trends in models of online technologies integration
4. Key influences on teachers' integration of online technologies
5. Key tensions the impact on teacher's integration of online technologies
6. Key barriers to teachers' integration of online technologies
7. Claims regarding the potential or need for integrating online technologies
8. Standards in online technologies integration

2.4.1 Access and Infrastructure in Online Technologies Integration

The European Commission (2013a) study *Survey of Schools: ICT in Education* surveyed three groups: head teachers, class teachers and students in grade 4 (9.5 year olds), grade 8 (13.5 year olds) and grade 11 (16.5 year olds), on ICT access, use and impact in schools across the EU-27. Regarding infrastructure, the European Commission (2013a) found that more than nine out of ten students are in schools with broadband, with transfer speeds of between 2 and 30 Mbps (megabits per second, a measure of data transfer speed). A majority of schools are connected at a basic level, through a website, local area network (LAN) or virtual learning environment (VLE). On average, between 25 and 35% of students in grades 4 and 8, and around 50% of students in grade 11, attend highly equipped schools, for example, schools with a good range of technology equipment, high levels of broadband access (10 mbps or more) and high connectedness. This study also found that there are on average between three and seven students per computer. Laptops, tablets and net-books are growing in popularity, trending away from desktop computers towards more portable computers and personally owned devices including smart phones. Half of grade 8 and grade 11 students use a desktop or laptop at least weekly during lessons at school. This number has doubled since the 2006 report. However, 20% of students in the same grades never or almost never use a computer during lessons. Approximately 30% of students at grade 8 and 20% at grade 11 use an interactive whiteboard at least weekly. Interestingly, this study found that there was no link identified between high levels of infrastructure and teachers' and students' use, confidence or attitudes towards the integration of technology in learning. (European Commission 2013a) In terms of levels of access to online technologies within the US education system, PBS's *Digitally Inclined Teachers Increasingly Value Media and Technology* report outlined the degree of access to equipment and resources in US PreK-12 schools and classrooms in 2009. Almost all (93%) of US teachers reported that their schools had Internet access, while 81 percent reported computer Internet access in their classrooms, up from 77 percent in 2008. Only 36 percent of PreK-12 teachers had computers with Internet access in their classes. (Vockley Lang, 2009)

School policies can have a significant effect on the nature and extent of access and usage of online technologies. The European Commission (2013a) *Survey of Schools: ICT in Education* report highlighted that 50% of EU students attend schools where formalised school policies exist on the use of ICT in general and within subjects. Only 20% of EU students are in schools where over-arching formal policies have been adopted covering general ICT use, use in teaching and learning, and within subjects. Policies regarding responsible use of the Internet are being broadly adopted by schools, but policies regarding safe use of social media are being adopted to a lesser extent. According to the European Commission (2013a) survey, 61-69 percent of schools have a policy on responsible Internet behaviour, 34-38 percent have a statement on the use of ICT specifically for teaching and learning and 45-56 percent have a policy for ICT in specific subjects. Between 32-57 percent of schools have a policy about the use of social networks in teaching and learning. Interestingly, this study also found that the highest incidence of ICT use and integration of ICT based learning activities within lessons occurs among students and teachers in schools that combine policies promoting ICT integration in teaching and learning generally speaking, as well as within subject learning.

From the review of literature within this theme, it is evident, as highlighted by Fethi and Lowther (2010), that access to technologies alone is not an indicator of technology integration in classrooms. Indeed, the European Commission (2013a) Survey found there was no link between high levels of ICT provision and students' and teachers' confidence, use and attitudes towards technology in education; but instead that there were positive correlations between school policies, and/ or the provision of practical support for teachers, and the integration of technology in the classroom. Therefore, access and infrastructure can present numerous challenges to online technologies integration within an educational setting. Teachers may have access to a computer but find navigation of the Web impossibly slow due to narrow bandwidth service or slow processing hardware; they may have physical access to a computer but lack the computer literacy skills or practical support to effectively use it; they may be able to use a computer but may not know where to look for resources; they may be restricted from using certain applications or

visiting particular websites through NetWare that reduces or blocks levels of Internet access; or they may not be permitted to use social media and other online technologies as a result of restrictive acceptable usage policies within schools. Furthermore, providing access to particular technologies for classroom use does not mean necessarily that they are being integrated in a meaningful manner from a learning point of view. It is important to note here that the home environment may be less restrictive for teachers in terms of what they are permitted to access, but still may be problematic due to the aforementioned issues.

According to Simba (2010), the US market intelligence group in media and publishing, technology and digital media influences all aspects of K-12 instructional materials, as new media and old complement each other, and technology continues to grow. Even the traditional US Basel offerings (textbooks that teach the core curriculum as opposed to supplementary educational resources) have moved from print to digitally based media and include websites, online videos, assessment banks, podcasts, etc. eTextbooks have become the home version of the in-class textbooks. (Simba 2010) This trend of technology offerings, according to Simba (2010) is set to grow. The widespread availability of broadband and Wi-Fi; mobile devices including tablets and smartphones; and digitally available content including video, Weblogs and podcasts is influencing education. Expectations of users, including teachers and students in the primary and post-primary sectors are increasing in terms of technology available outside school. The 'digital natives', or the 'Net generation' (those who have grown up with technology and the Internet) as they are sometimes referred to, understand the opportunities of the Internet, often better than the teachers who did not grow up with the Internet. (U.S. Department of Education, 2004) The anecdotal evidence suggests that these digital natives are adopting social media technologies as a means of communication, collaboration and sharing resources at a phenomenal rate outside school contexts and, according to Kennedy (2012) expect these technologies to be used in schools.

Finally, schools in the past blocked students from using their own computers/ laptops, however, a new trend has emerged in education particularly within the US, referred to as *bring your own device* (BYOD) (Rigol and Fairfield 2012), or *bring your own technology* (BYOT), or *bring your own browser* (BYOB), where students are not only allowed, but encouraged to bring along their smartphones, tablets and other devices, such as in the case of the Lewisville (Texas) Independent School District. Within the US, if students don't have their own devices, the district will provide resources for them to access the Internet. The extent of the practice of students' utilising their own devices within the EU is not well documented within the literature. However, in its broad policy recommendations, the European Commission (2013a) report urges institutions to leverage the high levels of personally owned mobile devices. In light of this, schools may need to re-consider the pros and cons of existing school policies that restrict access and/ or use of personal devices within the classroom, and devise new policies and strategies that support the use of personal technologies, while protecting the learner and the learning community.

2.4.2 Trends in Types of Online Technologies/ Activities Being Used

A number of trends will be discussed here in terms of: the use of Web 2.0 and social media tools in personal use of students and teachers; the rise in mobile technology and mobile learning; game-based learning and augmented reality; and trends in the types of technologies being used in the professional development of teachers.

2.4.2.1 Trends in Types of Online Technologies/ Activities Used in Personal Lives

Social media technologies, including social networking sites such as *Facebook* and *LinkedIn*, social networking tools (*Ning*), social media sharing tools (*YouTube*, *Flickr*, *Slideshare*), content aggregation tools (*Storify*), social bookmarking tools (*Diigo*), collaborative writing tools (*Google Docs*), virtual worlds (*Second Life*), communities of practice and online networking sites, podcasts, wikis, blogs, and many more, are being used today in the personal

lives of students and teachers; and in the professional development and classroom practice of K-12 educators. *Faceboo*k, developed in 2004 by Harvard undergraduate Mark Zuckerberg, is the ‘‘*dominant*’’ social networking site (Lenhart, Purcell, Smith and Zickuhr 2010) with one billion users as of October 2012. (Facebook.com) *LinkedIn*, which launched in May 2003, is a professional networking service that allows users to affiliate with others in their community, maintaining a list of contacts for people they know and trust. According to Papacharissi (2009, cited in Tess (2013), the trust factor is an important concept in social networking as connecting with others requires either a pre-existing relationship or some mutual contact.

These technologies have become an integral part of life allowing users to create a personal profile, create content, share messages and photos by connecting with other users in the system, generate content and/ or choose to ‘‘*like*’’. Friedman and Friedman (2008) propose 5Cs to highlight the commonality of new social technologies: communication, collaboration, community, creativity, and convergence. These technologies are concerned with *communication* in one form or another, blogs for example. New media technologies facilitate *collaboration* over the Internet, for example, wikis, *Google Docs, Skype, Facebook* and virtual communities like *Second Life*. *Community* is promoted through social networking sites like *MySpace* and *Facebook*; virtual universes like *Second Life* and *Webkinz*; social bookmarking technologies like that of *del.icio.us*. Current users are no longer passive recipients of information, they can use their *creativity* to edit videos, post to blogs, post product reviews, and contribute content in a host of ways. *Convergence* is used to describe the coming together or ‘mashup’ of software applications e.g., applying *Google Maps* to real estate data to map the available homes in a particular community.

There is an unprecedented rise in the use of Web 2.0 and social media technologies among US teens and adults in their personal lives. According to Lenhart, Purcell, Smith and Zickuhr (2010, p. 9), it is a “*central and indispensable element in the lives of American teens and young adults*”. In their US-based survey of social media and mobile Internet use among teens and

young adults, they surveyed 800 adolescents (between ages 12 and 17) and 2,253 adults (age 18 and over). More than three-quarters of families with teens (76%) now have broadband Internet access at home, up from 71% in February 2008. Some 63% of teens go online every day, 36% go online several times a day, which is higher than the 68% of adult Internet users who go online daily. Older teens are more likely to use online social networks than younger teens. While 82% of teens (ages 14-17) use online social networks, just over half of teens (ages 12- 13) use these sites. This is understandable given the age restrictions on social networking sites 'disallowing' 12 year old and younger individuals from registering or posting profiles. As the number of adults who use online social networks has grown, so has the percentage of users who maintain multiple site profiles. In Lenhart, Purcell, Smith and Zickuhr (2010) study, 54% of adults with a social networking site maintained a profile on just one site, 29% had profiles on two sites and 13% had profiles on three or more sites.

2.4.2.2 Trends in Types of Online Technologies/ Activities Used in Classroom Practice

The New Media Consortium Report K-12 Edition (2012), an internationally recognised report in collaboration with the Consortium for School Networking, and the ISTE, identifies six emerging technologies that are likely to have an impact in the next five years in teaching, learning, and creative enquiry in the US, namely:

1. Mobile devices and apps - near-term - within the next 12 months
2. Tablet computing - near-term - within the next 12 months
3. Games based learning - mid-term - within two to three years
4. Augmented Reality - far-term, - within four to five years.
5. Natural User Interfaces

Mobile devices and tablet computing, previously banned in schools, have become a part of everyday life around the world and set to grow. Students have expectations of being able to work, play, and learn on these devices whenever they want and wherever they may be. Younger students will have grown up with touch technology, never having needed to use a mouse or other

peripheral device to access a computer. Apps are the fastest growing aspect, with 775,000 apps available in the Apple App Store in January 2013. (gigaom.com 2013) According to Johnson, Adams, and Cummins (2012), with technology enhancements, as well as key advances in electronic publishing, and the convergence of search technology and location awareness, mobile devices and apps will continue to grow in demand in the learning space.

Mobile technologies include mobile phones, portable digital assistants (PDAs), and integrated wireless enterprise solutions and networks (Blackberry/ 3G). Mobile technology usage has grown exponentially over the past 2-3 years and according to IESD (2012) study on mobile technology in education, this trend is likely to continue and will grow significantly in education. In the IESD 2012 study, 53.8 percent of survey respondents reported that mobile technology had been adopted in 25 percent of schools in their districts. A further 36 percent felt that their districts were somewhat or very likely to adopt mobile technology in the next 1-2 years. One fifth (20.3%) were from districts where mobile technology was already adopted and 15.7 percent formed districts where mobile technology was not adopted. Mobile devices on a cart, being shared by classrooms, were the most common method of access (41 percent). Some 33 percent reported a small number of devices available in the classroom that students share, and only 11 percent reported a 1:1 mobile device ratio. The iPad was the type of mobile device already adopted or planned to be adopted. iPods (38.8 percent) and BYOD (39.4 percent) models were also referenced. (IESD 2012) Regarding the likelihood of future mobile adoption in districts, respondents reported overwhelmingly that their schools were very likely or somewhat likely to adopt mobile technology in the next 1-2 years. (IESD 2012)

Madden, Lenhart, Duggan, Cortesi and Gasser (2013) surveyed 802 teens (12-17 year olds) and their parents to find that smartphone adoption among American teens has increased significantly since 2011 and mobile access to the Internet is ubiquitous. In the same survey, it was found that 78% of teens now have a cell phone, and 47% of those own smartphones, a 24% increase since 2011, while 93% have access to a computer at home. Access the Internet on cell phones, tablets, and other mobile devices at least occasionally amounted to 74%. One in four are “cell-mostly” Internet users. Older girls are likely to be cell-

mostly Internet users; 34% of teen girls ages 14-17 say they mostly go online using their cell phone, compared with 24% of teen boys of the same age.

In terms of games-based learning and personalised learning environments, it is recognised by Halverson (2005) and Johnson, Adams, and Cummins (2012), that educational gaming can make learning more engaging for students, while at the same time improving skills, such as collaboration, creativity, and critical thinking in K-12 education. The goal of Personalised Learning Environments is for students to have more control over their own learning, just as they do at home, and games-based learning can form an integral part of this process. Learning through play has the ability to really engage students. ICTs offer opportunities in the form of digital games and simulations. Examples of these are *Lego Mindstorms* for Schools (based on a partnership between Lego and the MIT Media Laboratory) with hardware and software provided to make small, customisable and programmable robots.

The last two trends mentioned within the New Media Consortium Report K-12 Edition (2012) relate to moves towards Augmented reality and Natural user interfaces. Augmented reality is considered an intuitive doorway through which data can be easily attached to real world objects, settings, and processes in a way that facilitates a deeper understanding of what is being seen. Developments within the Natural user interfaces make the technology easier to use, allowing us to interact with devices through touch, movement, voice, and even facial expressions.

2.4.2.3 Trends in Types of Online Technologies/ Activities Used in Professional Development

Moving forward to the realm of teacher professional development, trends towards online technologies usage within the CPD of teachers are now becoming evident. Online learning in the professional development of teachers is rapidly becoming a preferred model for participants, providing a level of convenience, eliminating the need for travel, childcare, and facilitating asynchronous scheduling. The various online models of CPD have already been outlined and

discussed in section 2.3.2. The trends in platforms for online CPD tend towards Learning Management systems (such as Moodle or Blackboard), with social media and Web 2.0 technologies increasingly being promoted for communication and collaboration. (Holmes, Signer, and MacLeod 2010) The remaining discussion therefore centres on a discussion of social media integration in the CPD of teachers.

Trust (2012) recognises that highly effective teachers model a process of analysis and knowledge acquisition by learning about pedagogical techniques and best practices, through collaboration and professional development. Teachers' learning can now encompass professional learning networks (PLNs). "A PLN is a system of interpersonal connections and resources that support informal learning". (Trust 201, p. 133) Flanigan (2011), as cited in Trust (2012) describes PLNs as teacher-driven, global support networks that reduce isolation and foster independence. Trust (ibid) further describes two types of PLN: information aggregation and social media connections. Information aggregation PNLs involve online communities that follow new sources of information through really simple syndication (RSS) feeds, for example: posts, articles, and Web site updates. Teachers can scan the content and choose what to read further. In addition, information aggregation can involve "*follow me*" or "*Subscribe*" which then sends content via e-mail. (Trust 2012) Within PLN, social media tools are used to connect teachers with a global audience. Social media tools (*Facebook*, *Twitter*), affinity-based group sites (*Ning*, *Wikispaces*), and real-time interaction tools (online chat rooms, instant messaging, *Skype* and *Second Life*) tend to be the tools of choice for PLNs. Teachers participate in PLNs to share and receive information, connect with members, find resources, ask for ideas, and receive feedback or assistance. According to Trust, 2012, teachers' motivation includes a desire to grow professionally, to learn from others, and contribute to the community.

The integration of social media, Web 2.0 and other technologies to support CPD or PLNs has been slow, and the level of research on this is at a low level. However, some examples are discussed here. In a US-based study, Holmes, Signer and MacLeod (2010) examined the efficacy and teacher

experience of WebCT (a virtual learning environment) in a 5-week distance-learning model for K–12 in- service teachers. The findings highlight the need to establish a sense of "*presence*" online, and features that contribute to the enhancement of online professional development online. Holmes *et al.'s* (2010) study examined teaching/ teacher, social, and cognitive presences in teachers' online professional development experience. Social presence and teacher presence were found to be the greatest factors related to participants' learning and satisfaction. "Social presence" involved interactions with other colleagues online through asynchronous discussions, chats, postings of papers/ artefacts, using social media and e-mail. Participants felt that they were able to develop relationships that promoted learning. "Teacher presence" had less impact on participants' learning and qualitative responses suggested more feedback and interactions, synchronous chats, faster responses and additional guidance. Regarding "cognitive presence", participants agreed that they benefited from the online forum, readings, and resources and that these would contribute to their ability to apply new concepts in classroom practice. Overall participants strongly agreed that their experience in the online professional development course positively impacted their knowledge and instructional practice.

Hur and Hara (2007), through the INDISCHOOL online teacher community in Korea, attempted to discover factors related to fostering a sustainable online community for K-12 teachers; a type of PLN for teachers. Interviews and posts revealed twelve factors; eight support factors and four hindrance factors to the enablement of PLNs. These factors were categorised into three subgroups: internal, external and outcome factors. Internal support factors comprised; autonomy, sense of ownership, acknowledging values of participation. External support factors included; provision of online and offline interaction and ease of use of technology systems. Outcome factors included; helping novice teachers become confident educators, overcoming teacher isolation and meeting teachers' individual needs. The hindrance factors included; teachers' lack of confidence, previous negative experience with online communities, lack of technical support and discouraging teachers' active learning.

DiPietro, Ferdig, Black and Preston's (2008) study of 16 virtual school teachers from the Michigan Virtual School (MVS) through observation and interviews reports on best practices in general characteristics of teachers, classroom management, pedagogical practice and technology. Twelve teacher characteristics emerged, including: student support, expertise in course content and competence and interest in new technologies, understanding of learning styles, time flexible, ability to establish a presence in Virtual Courses, use of student and course data for self-evaluation, understanding of course pacing and design for students. Two classroom management strategies included strategies for dealing with inappropriate or abusive behaviour and monitoring of venues to identify students in crisis. In addition, 23 pedagogical strategies were presented including the use of multiple forms of assessment, engaging students with content, making the course meaningful for students, providing support and focusing on communication and community.

2.4.3. Trends in Models of Online Technologies Integration

This section outlines what models or theories of learning underpin the integration of online technologies in teaching and learning. It centres on a discussion of three key theories or frameworks, namely, Siemens Theory of Connectivism, Wenger and Lave's Communities of Practice, and Daphne Koller's concept of the *Flipped Classroom*.

This discussion begins with an outline of the key elements of emerging technologies identified by Johnson, Adams and Cummins (2012) that will impact K-12 and Higher Education by 2018. In combination, these are:

1. Anytime, anywhere learning – teachers and students expect to easily access up-to-date information 24 hours a day and 7 days per week (24/7). Access to social media and networks have raised this expectation. Informal learning opportunities abound and support the earlier notions of "*just-in-time*" learning.
2. Increasing interest in using new sources of data for personalising students' learning experiences and for performance measurement. Analytics from learning management systems can provide useful dashboards to

monitor student progress in real time. These analytics will enable continual improvement of learning outcomes.

3. As technology becomes more capable of processing information and analytics, educator focus can shift to fostering critical thinking, creativity, and other soft skills. Students no longer need to make calculations by hand or to read a print map for directions, therefore higher-order skills of communication, creativity, critical thinking will be areas of focus in education.
4. Challenge-based learning and similar methods foster more active learning experiences, both inside and outside the classroom. Educators are leveraging technologies such as tablets and smartphones, which students already use, to connect the curriculum with real life issues. Active learning approaches are more student-centred, allowing students to take control of their own learning. If students connect with content in their out of school lives, they will engage better with what they are learning in school
5. Online and blended learning approaches, as well as collaborative models allow students to leverage 'living technologies' such as the Internet and social networks for learning, are increasing in K-12 education. Increased opportunities for collaboration contribute to equipping students with stronger digital skills as well as enabling them to learn at their own pace, however they wish, whenever they want, wherever they are. With the vast amount of resources and relationships available on the Internet the challenge for K-12 educators is to support students in making sense of this information for their educational purposes.
6. The value placed on concepts such as open content, open data, and open resources requires educators to support students to critically review materials that can be freely copied, remixed, and shared.
7. Mobile learning including smartphones, tablets and apps

(ubiquitous and cheap) provide another avenue for delivering "*education on demand*" to students

8. Formal and informal learning (learning outside school setting) is by its nature self-directed, aligning with students' personal learning goals. Leveraging both types of learning will become more and more important in learning environments of all kinds.
9. More and more students are choosing to use their own tools and technologies and as devices are becoming more affordable, students have access to more advanced equipment in their personal lives than at school. School districts will need to open up their access policies to accommodate the BYOD movement allowing students to use devices they own for out-of-school settings, as learning tools in the traditional classroom setting. Schools can save money on hardware and maintenance, leveraging funds for students who cannot afford these devices and embrace the concept of mobile learning. One-to-one computing models facilitate better student achievement.
10. Analytics allows for content to be delivered and tuned to improve student learning and facilitate personalised learning. Gesture-based technology, such as natural user interfaces enables more intuitive interactions between students and learning resources.

These ten key elements give us a flavour of what to expect in terms of technology integration in education in the near future. A number of key practices have already emerged from the literature with regard to how best to integrate these types of technology and social media in classroom practice at present. Dias and Atkinson (2001), among many others, recommend pedagogies based on Constructivist (or indeed Socio-Constructivist) learning theories, providing opportunities for students to explore and experiment. The theories of Piaget (1967) and Vygotsky (1978) are at the heart of constructivist learning theory

which maintains that people are shaped by their experiences and within constructivist learning, create and build on their knowledge through personal experience. Therefore, online learning environments must support creative and collaborative learning environments for students, foster connectedness, and support professional networks of teachers, based on communities of practice and interest. Siemen's Theory of Connectivism (2004) has much to offer in this regard.

2.4.3.1 Siemen's Theory of Connectivism

Connectivism is a theoretical framework for understanding learning that takes place in digital learning spaces. The connectivist model suggests that learning takes place when learners form connections between many different forms of knowledge (offering multiple perspectives) that is distributed across many different spaces, such as personal learning networks and/ or public spaces, and made accessible through online technologies, such as social media. According to Dunaway, (2011, p. 676), within connectivism, "*Knowledge emerges from an individual's learning network as she recognizes connections between concepts, opinions, and perspectives that are accessed via Internet technologies such as electronic databases, web search engines, and online information resources*." In the Theory of Connectivism, Siemens (2004) proposes connectivism as a learning theory for a networked world and describes the central principles of connectivism as: connecting information sources, learning and technology being tightly coupled, learning and knowledge incorporating diversity of opinions, the ability to appreciate connections between perspectives and opinions in the learning process, maintenance of these connections and facilitating continuous learning. He defines the network as:

> connections between entities. Computer networks, power grids, and social networks all function on the simple principle that people, groups, systems, nodes, entities can be connected to create an integrated whole. (Siemens 2005a: online)

Within this vision of the networked world, Siemens alludes to what has been more recently coined the 'Internet of things', the many different forms of knowledge (data, information, opinions) and places where it can be stored

(from the individual's mind to non-human systems, such as power grids). Siemens (2005a) proposes that within connectivism the learning is actively 'controlled' by the learner, who makes decisions about what is learned, the sources of information for learning, and utilises his/ her personal learning network to activate the learning process. The principles of connectivism according to Siemens include:

- Learning and knowledge are situated in diversity of opinions
- Learning is a process of connecting information sources
- Learning may exist in non-human machines
- Potential or ability to know more is more significant than current knowledge
- Fostering connections is required to facilitate continual learning
- The ability to see connections between ideas, and concepts is a core skill
- Current knowledge is key to all connectivist learning activities
- Decision-making is itself a learning process, a right answer today, may be the wrong answer tomorrow based on changes in the information climate affecting the decision

Siemens Theory of Connectivism requires new skills (for teachers and learners) in terms of being able to access distributed knowledge - 'knowing where' to access information across the distributed network, and also core evaluative skills to trigger the knowledge that is needed at the point that it is needed. It also recognised that "learning is no longer an internal, individualistic activity". (Siemens, 2005a: online) The open, participative, social Web actually necessitates a focus on higher-order cognitive and social competencies that are realised predominantly through dialogue and discourse.

Downes (2006) and Siemens (2005a, 2006) notion of "*thinking in networks*", looks at connectivism as a way to explore learning in this digitally networked age. Ravencroft (2011) claims that this allows us to avoid the conflict between individual cognition, distributed cognition, individual learning, and networked learning, proposing that "*we will always learn by being alone and*

together" (online). Learning can take place in a participation framework and an individual mind. Tschofen and Mackness, (2012) recommend recognition of both benefits, those of; networked learning while also focusing on the unique individual.

2.4.3.2 Wenger and Lave's Communities of Practice

Communities of Practice (CoP), a term coined by Lave and Wenger, eminent thought leaders in communities of practice theory, are: "*groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly*". (Wenger 2006: online) They share three crucial elements: the domain, the community and the practice:

1. The domain: the CoP identity is defined by a shared domain of interest. Members are committed to the domain, and share competence, which distinguishes them from other people.
2. The community: members build relationships in order for them to learn from each other.
3. The practice: community members are practitioners, involved in developing shared resources: experiences, stories, ways of addressing recurring problems—in short a shared practice. This takes time and sustained interaction.

Wenger (2000, p.229) maintains that since the beginning of time, people have "*formed communities that share cultural practices reflecting their collective learning*". Individuals define competence for a particular context by engaging in the CoP. Wenger maintains that there are three elements for defining competence for CoPs; *joint enterprise* (sufficient understanding to be able to contribute), *mutuality* (engage and become a trusted partner in the community) and *shared repertoire* (access to the shared artefacts that have been created as part of the community). The elements of leadership, connectivity, membership, projects and artefacts are common to CoPs. Effective learning communities provide members with opportunities to build on the individual's and the group's knowledge, get involved in decision-making, take risks without fear of failure, develop expertise, experience many different activities, and work on

interdependent tasks with others. According to Dias and Atkinson (2001), this participation develops in the learner the ability to reason about learning, to think reflectively and critically, and to become motivated to learn independently throughout their lives.

Teachers are increasingly participating in online communities of practice, forum discussions, and learning opportunities provided by online technologies; particularly Web 2.0 enabled technologies and social media technologies. Teachers use the Internet to connect, collaborate and create with colleagues and improve their professional skills through use of social networking sites (*Facebook*, *Twitter*), affinity-based group sites (*Ning*, *Wikispaces*), and real-time interaction tools (online chat rooms, instant messaging to connect with experts and colleagues around the world. According to Trust (2012), highly effective teachers learn through collaboration, professional development, and research into best practices. Teachers join online communities; subscribe to blogs and Web sites to continually learn and improve their practice (for example, 6.5 million US teachers and students use Edmodo, a social-networking tool for educators. Classroom 2.0 and The Educator's PLN have in excess of 72,000 members, with more than 2,000 teachers participating in weekly online education discussions on Twitter hashtag #ed-chat).

In a US study of online professional development for teachers by Holmes, Signer and McLeod (2010), teachers were provided with Web-based readings and interactive activities that supported teachers in classroom implementation. The focus was to provide opportunities for "*discussion, exploration, implementation, collaboration, and reflection with the instructor and colleagues online regarding the curriculum content*". (Holmes *et al*. 2010, p. 78) Course participants were expected to log into the WebCT platform several times per week to post assignments, write reflective responses and classroom integration updates as well as interacting with their peers and the instructor. A factor analysis was conducted using the areas of social presence, teacher presence, effectiveness/ satisfaction with the course and cognitive presence. The study concluded that the online learning environment, the quality of instruction, interactions and resources were significant factors in participant learning and

overall satisfaction within this online professional development experience. Participants in the study also valued tools that promoted social networking and connections to the learning community.

Therefore, emerging social and Web 2.0 enabled technologies provide opportunities for teachers to give and receive feedback and advice from peers, and to meet life-long learning goals. As online learning uptake increases, these tools will become increasingly more important in the facilitation of communities of practice, and thus in the enablement of teachers' professional development.

2.4.3.3 Flipped Classroom

Daphne Koller (2009) of Stanford University has been credited in some publications with coining the phrase "*Flipped Classroom*", although others such as Strayer (2012) have found reference to the concept of the Flipped classroom much earlier where it was referred to as the inverted classroom (Lage, Platt and Treglia 2000) or the classroom flip. (Baker, 2000) The 'Flipped classroom' is effectively a blended model of learning involving face-to-face and online learning, where students study the key concepts at home and engage in discussion and problem-solving within class-time. This model is underpinned by many of the emerging trends in technology integration discussed at the outset of this section. According to Freeman-Herreid and Schiller (2013, p. 62), "*A guiding principle of the flipped classroom is that work typically done as homework (e.g., problem-solving, essay writing) is better undertaken in class with the guidance of the instructor*". Thus, the flipped classroom model switches or "*flips*" what is usually covered in class and what is done as homework. Students are required to read or listen to an audio or video lecture on a topic, for example genetics, at home and the next day in class, they engage in active learning activities including problem-solving, labs, games, simulations, or experiments. The Flipped Classroom model is gaining in popularity in education since Jonathan Bergmann and Aaron Sams at Woodland Park High School in Colorado, USA, decided to record their science lectures for their students. (Bergmann and Sams 2012) Freeman-Herreid and Schiller (2013) have

commented that the "*flipped*" approach in teaching and learning has become particularly attractive due to the availability of a wide range of audio and video Internet resources across all subject areas, the *Khan Academy*, for example.

Fulton's (2012) case study of math teaching and learning using the 'Flipped Classroom' model at Byron High School (BHS), Minesota. Faulkner, the 12th grade calculus teacher is outlined in *Figure 2.3*: Case Study Extract.

> [The teacher] welcomes the students and talks about the day's task as he puts a couple of key problems on the electronic white-board to check for understanding on last night's video lesson. He gives the students time to work on the problems, then discusses the solutions with his students. After a lively exchange, the students get down to work at their own pace and in their own style. Some choose to work in groups, while others prefer to sit alone on the floor or even out in the hall, plugging in their earbuds to block out everything and everyone around them. The expectation is that they all watched a video of Faulkner teaching the lesson the night before and are ready to demonstrate their understanding using the day's problems. Some review the video lesson as they work, while others breeze though the problems at a fast pace, then move on to the next night's assigned video. Faulkner moves from student to student, watching, listening, noting who needs help. If several students are stuck on a problem, he might work through more examples on the board at the front of the class. And, just to be sure, there are daily spot quizzes, often using clickers so the students and teacher get immediate results. The feedback allows for group discussion and peer instruction on the problems that many students are struggling with and helps Faulkner and his colleagues target—and revise in real time—instruction on concepts that students find difficult.

Figure 2.3: Flipped Classroom Case Study Extract from Fulton (2012, p. 13)

The results from Fulton (2012) case study speak for themselves, student scores rose dramatically on standardised math tests. In 2010, BHS mastery level on the Minnesota Comprehensive Assessment (MCA) was 65.6%, up from 29.9% in 2006. By 2011, having implemented flipped classrooms in 2010–11, the score had risen again, to 73.8% mastery on the MCAs. Students and parents experience of the flipped classroom model was also positive. Students within Fulton's case study appreciated the fact that they could learn at their own pace, for example, rewind and pause videos for understanding, ask questions in class on difficult topics, watch the concept at home and master in class to achieve conceptual understanding of the subject at hand. According to

Fulton (2012), parents felt that the flipped classroom was a much better use of students' and teachers' classroom time. This case study has shown the capability of the 'Flipped classroom' model to leverage the abundance of videos and other resources on the Internet, to facilitate student learning of new concepts outside of school, while reserving classroom time for discussion, collaboration with peers, problem-solving, and experimentation. According to Johnson, Adams, and Cummins (2012, p. 9), the flipped classroom model "*is not a panacea…but the growing success of the many non-traditional alternatives to schools that are using more informal approaches indicates that this trend is here to stay for some time*".

2.4.4 Key Influences on Teachers' Integration of Online Technologies

As technology integration continues to increase in our society, it is of paramount importance that teachers possess the skills and competences of digital age professionals. Moving forward, teachers must become comfortable being co-learners with their students and colleagues around the world. Pre-service and in-career development or professional development are widely acknowledged as extremely important in ensuring that teachers are equipped for their role in teaching. The greatest challenge is how to integrate online technologies appropriately in teaching and learning. Dias and Atkinson (2001) suggest that as technology becomes more available in classrooms and teachers integrate it in their teaching, it is also important to consider how we evaluate the efforts of teachers, who are integrating technology in their practice. Dias and Atkinson (ibid) also state that technology standards not only point to the value of using technology, but also the importance of integrating it into the curriculum with a view to creating meaningful learning experiences, and increasing technology literacy.

2.4.4.1 Teacher Readiness for Online Technologies' Integration

'Teacher readiness for the integration of online technologies' refers to whether teachers possess the skills to harness online technologies to help facilitate meaningful learning experiences. Sadaf, Newby, and Ertmer's (2012) study of first year pre-service teachers' beliefs about their intent to use Web 2.0

technologies in their future classrooms found that 51% were committed to Web 2.0 technologies as an instructional tool, primarily because of a perception that it increased student engagement. However, the pre-service teachers recognised that although they were comfortable users of the technology, they would need guidance as how to implement it effectively in their classrooms. (Sadaf, Newby, and Ertmer 2012). Similarly, Ajjan and Hartshorne (2008) concluded that training in the integration of technology was an important mechanism in influencing decisions by teachers to utilise Web 2.0 technologies in class. This was echoed by teachers in a study conducted by Yuen, Yaoyuneyong and Yuen (2011), who expressed interest in training to more effectively integrate Web 2.0 tools to support and supplement classroom instruction. Many other studies have proposed that teachers are in need of direction and training if they are to integrate online technologies, such as social media and Web 2.0 technologies, into their teaching. (Ajjan and Hartshorne, 2008; CERI, 2009; Crook, 2008) Therefore, institutions need to consider providing more training, focused on the use of online technologies in the classroom.

2.4.4.2 Teacher Confidence in Usage of Online Technologies

The European Commission (2013a) report on ICT usage in Education reported that the majority of EU school heads and teachers feel positively about the relevance of ICT use in learning activities, as well as the positive impact of ICT on student motivation and achievement, including the development of higher-order thinking skills. They are also in agreement that ICT use is essential to prepare students to live and work in the 21st century. Teacher confidence is key to ICT use as the European Commission (2013a) report attests. Teachers use ICT most often when they are in schools with easy access to equipment, and even when they are in schools with low ICT provision, more so than teachers lacking confidence even in schools with high ICT provision. Teachers' age and number of years teaching was negatively correlated to confidence in their ICT skills. A positive correlation was found between number of years using computers and the Internet at school and teachers' confidence and skills. (European Commission 2013a) Confidence in using ICT is usually aligned with more participation in professional development and time spent on ICT training. This in turn results in

more frequent use of ICT-based activities during lessons across all grades. Not surprisingly, the European Commission (2013a) report on ICT usage in education found that teachers across EU countries, are more confident in their ICT skills than in their use of social media. In addition, students taught by "*digitally confident and supportive teachers"* use ICT more during lessons, 20-25% of students across the EU are taught by these teachers. Furthermore, students taught by confident teachers (even those with low access and high obstacles) reported more frequent use of ICT in lessons than those taught by high access and low obstacles but teachers having low confidence.

2.4.4.3 Student Confidence in Usage of Online Technologies

The EU commission uses the term "*digitally confident and supportive students*" to refer to students that are confident in their digital competences, but also positive about the impact of ICT in teaching and learning. Within the European Commission (2013a) report on ICT usage in Education, students reported a high level of confidence in using the Internet safely but a lower level of confidence in their use of social media. Students who had high levels of access to and use ICT at school and at home reported higher confidence in their ICT skills, and in their use of social media. They were also more positive about ICT's impact on their learning, compared to students reporting low access and use at school but high access and use at home. The majority of students were also positive about the impact of ICT on classroom atmosphere and on different learning processes.

2.4.5 Key Tensions that Impact on Teachers' Integration of Online Technologies

Three main tensions that impact on teachers' integration of online technologies are discussed here namely the "digital natives" versus "digital immigrants", "living technologies" versus "learning technologies", and e-safety.

2.4.5.1 "Digital Natives" Versus "Digital Immigrants" Debate

According to Prensky (2001, p.1), "*Our students have changed radically. Today's students are no longer the people our educational system was designed to teach*". Prensky (2001), coined the phrase ''*digital natives*" referring to young people born between 1980 and 1994, who have grown up with computers and the Internet. People who have encountered digital technologies later in life were named ''*digital immigrants*", and are assumed to be more challenged by technology. Bull, Thompson, Searson, Garofalo, Park, Young and Lee (2008) regard the current generation of college students as "*Generation Y*". Immersed in digital technologies, they use instant messaging and other social media tools extensively in their personal lives. Tapscott (1998) refers to this cohort as the "*Net Generation*" due to their familiarity and reliance on Internet technologies. Howe and Strauss (2003) labelled this generation the "*millennials*", setting them apart from previous generations. These digital natives, Generation Y or the Net generation publish and share their thoughts, opinions, and ideas, as well as their knowledge, in open and interactive digital environments. There is a culture of 'openness and informality' among this generation, who freely publish their thoughts and/ or share private images or videos, and comment on others' posts within the public sphere, with little thought of present or future consequences of their actions.

Claims of this generation include; optimistic, team-orientated, technology literate. They are said to learn differently, be experimental learners, adept at multi-tasking and dependent on Internet technologies for accessing information an interacting with others. The gap in technological competence between "*digital natives*" and "*digital immigrants*" is referred to, by Waycott, Bennett, Kennedy, Dalgarno and Gray (2010), as the "*digital divide*". The thinking is that most educators would be classified as "*digital immigrants*", and thus, that a tension exists within education between these two groups that necessitates urgent reform in the training of educational practitioners to address the needs of the generation of "*digital natives*".

In their meta-analysis of state-of-the-art with regards to research on "digital natives", Bennett, Maton and Kervin (2008) refutes that a generation of "digital

natives" exists and that education must change in order to cater for them. They argue that a significant proportion of young people do not have the levels of technology access and skills claimed. Furthermore, they conclude that there is little evidence to support the supposed attributes of digital natives, or that they use technology to support their learning. According to Bennett, Maton and Kervin (2008), technology plays a different role in this generation's lives inside and outside of school. Bennett, Maton and Kervin (2008) further argue that rather than being empirically and theoretically informed, the digital natives debate is nothing short of "*moral panic*". They propose a measured view in order to explore possible implications for education.

Cai and Zhu (2012) investigated the impact of an online learning community project on university students' motivation in learning Chinese as a foreign language. The qualitative analysis of students' responses revealed motivating and demotivating features of the online learning community project from the participant perspective. Motivating features focused on learning resources and tools provided, and opportunities to connect and interact with other Chinese learners. Demotivating factors focused on technology issues (e.g., difficulty in navigating the forums and problems with sound recording programs) and time and work required by the project. (Cai and Zhu 2012) Although these students would be referred to as the "*digital generation*", not all students were found to be equally technology-savvy or familiar with the specific technologies to be used for academic studies. This research suggests that technology training should be provided at the beginning of courses, and technical assistance provided throughout the process, regardless of whether learners could be classified as "*digital natives*" or not.

Frost (2011) set out to incorporate computer-based technologies in preparing to teach 23 first-year students composition. Frost gave control to students to drive their technology use and learning. Although all students qualified as "*digital natives*" all had an active *Facebook* account and were eager to embrace technological approaches to composition, they encountered new media throughout the class, for example, most had never written a blog before.

Frost (ibid) maintained a focus on technology as integral to the class, encouraging blogging as well as a wiki site for class information, supporting students in choosing technology-based projects, requiring projects to be turned in online, and maintaining regular contact with all students through e-mail. Frost (ibid) concluded that this project provided students with the opportunity to learn between digital and physical spaces. Many students were eager to work collaboratively when allowed to incorporate digital as well as physical spaces into that work.

> By letting student innovation drive pedagogical practice—just as social media creators let user innovation drive the digital structures they produce—composition teachers can be assured of having a text for critique that blurs the lines between student underlife and classroom practice. This legitimization of media relevant to students also lets students know that their work is real and relevant; they often find a tangible connection between their personal and academic lives empowering, especially when they have been allowed to seek that connection on their own. (Frost 2011, p.269)

By allowing student innovation to drive pedagogical practice composition, Frost (ibid) urges teachers to legitimise media relevant to students to let them know that their work relevant. In this way, they forge a connection between their personal and academic lives. In addition, Frost (ibid) claims that this approach allows educators to observe "*digital natives*" as users in order to develop pedagogies to better serve those users' futures.

2.4.5.2 The Distinction Between "Living Technologies" and "Learning Technologies"

Hosein *et al.* (2010, p.404) define living technologies as "*those technologies that young people choose to use in their everyday lives mainly for their social lives and for leisure purposes, for example social networking sites, computer games and mobile (cell) phones",* while learning technologies are *"those technologies that students use primarily for study purposes, which may include office-oriented software, certain uses of Web 2.0, networked learning and virtual learning environments"*. Hosein *et al.* accept that there may be overlap between these two

realms of use, where living technologies, for example blogs or wikis can be used for learning purposes. Waycott, Bennett, Kennedy, Dalgarno and Gray (2010), in their literature review discussed the divide between "*living technologies*" and "*learning technologies*". They also referenced the ways in which students use technologies in their everyday interactions with family and friends that are distinct from their use of these technologies in formal learning settings. They concluded that use of technologies is closely aligned with particular social norms:

> The different ways in which technologies are put to use may largely be accounted for by the motivations and social rules that different activities encompass for individuals within each context, and that this has implications for anyone seeking to successfully integrate social technologies into educational contexts. (Waycott *et al*. 2010, p. 1209)

Waycott, Bennett, Kennedy, Dalgarno and Gray (2010) also investigated Australian university staff and students' perceptions and use of current and emerging technologies in their daily lives, in particular the benefits and limitations of these tools in teaching and learning contexts. Forty-six first-year students and 31 teaching and support staff from three Australian universities took part in interviews and focus groups. Their findings also question the ''*digital divide*" between ''*digital native*" students and their ''*digital immigrant*" teachers in higher education. Waycott, Bennett, Kennedy, Dalgarno and Gray (2010) suggest that a better understanding of the role technologies play in the lives of students and staff will result in better-informed decisions on implementation in today's higher education institutions. Findings of this study did not identify a significant gap between technology use in teachers and students who used many of the same technologies in their every day lives. It did more to emphasise the similarities between skills level of students and staff and calls into question the notions of digital native and immigrant. While there was a social focus to students' use of everyday technology, this did not translate into the desire to be connected for learning activities, and indeed was perceived to possibly interfere with the learning.

Alverman, Hutchins and McDevitt (2012) assert that young people's interests in 21st Century texts, and the literacy practices that take place in Web 2.0 spaces, have implications for educators. Jones, Blackey, Fitzgibbon and Chew (2010) discovered a distinction in student perceptions regarding technology use in "*personal space*" versus the "*learning space*", 70% of students reported having a social networking account, but indicated that they rarely used social media for educational purposes. Three reasons emerged: 1) Students were inclined to separate their social life (pleasurable) from their learning (painful); 2) Students were concerned about copyright infringement on original sources and ideas that were posted; students wanted to avoid information overload and additional time that might be needed. Friesen and Lowe (2011) further questioned the ability of social media to encourage debate and disagreement, a crucial component of learning and argued that social networks were not developed for formal education. Madge, Meek, Wellens and Hooley (2009) cautioned against ''*over-privileging*'' of SNSs, and suggested that academic adoption of social media should involve a study of ownership and boundaries.

According to Ala-Muta, Punie and Redecker (2008b), while ICT is widely used to support learning in an informal way, formal education and training is lagging behind in accessing the potential benefits of ICT to improve learning opportunities, in the utilisation of social media to provide opportunities for innovation in education outside school, and in preparing 21st century learners. In the European Commission (2013a) study on ICT use across the EU, students said that they rarely undertake ICT-based activities or use digital resources within school. Students use ICT for learning more at home than at school. This points to more natural usage of ICTs in informal or non-formal learning outside of school. Therefore, online technologies have the potential to dissolve the line between formal and informal learning, allowing scope for new ways of participating and communicating, collaborating and self-publishing.

However, Bull, Thompson, Searson, Garofalo, Park, Young and Lee (2008) noted that in order to leverage the informal use of ICTs outside of school

into applied activities inside schools, teachers need to think about the content and pedagogies best suited to bridging these in and out of school uses of technology. Schieble's (2010) study on how pre-service English teachers applied their use of out-of-school social media, e.g. participation in social network sites, to their teaching practices, is a rare examination of transferable technology 'literacies' from one domain (out-of-school) to another (in-school). Schieble found that pre-service English teachers used a range of out-of-school 'social media' in their teaching practice, leveraging *Moodle* and *Facebook* for character development, and leveraging *Facebook* photos to create a PowerPoint presentation to provide students with an appreciation of Nepal, the context of one of the books on the literacy course. Schieble urges the K-12 and higher education sectors of education to continue to support access to digital tools and to validate pre-service teachers' and students' creative capacities to engage with these tools.

2.4.5.3 eSafety in the Midst of Web 2.0 and Social Media

While the Internet and social media technologies are lauded for their potential in education, many challenges exist with regard to security, privacy and safety for online users. Much research has been undertaken in recent years regarding children and young people's use of the Internet and digital technologies .The *UK Children Go Online (UKCGO)* study investigated 9–19-year-olds' use of the Internet between 2003 and 2005. The study found that children lack key skills in gauging online content. Children can divulge personal information online (46 per cent) and 57 per cent have come across online pornography. Interestingly, it also found that restricting access to the Internet was potentially more damaging that the risk of exposure to the aforementioned e-safety concerns. (Livingstone and Bober, 2005)

BECTA's 2006 report on *Safeguarding children in a Digital World* recognises the opportunities afforded by the convergence of technologies on learning "*anytime anywhere*", as well as risks to the safety and well being of students. Examples of security issues with regard to the Internet and digital technologies that teachers, parents and learners need to be aware of include:

exposure to age-inappropriate, inaccurate or misleading content; inappropriate contact, for example, grooming using communication technologies; exposure to inappropriate commercial advertising; bullying via websites, mobile phones or other communication devices, downloading of copyrighted materials e.g. music and films. The BECTA (2006) report accepts that it will never be possible to completely remove these risks and therefore recommends a combined effort across policies and practices, education and training and infrastructure. The e-Safety challenges, which include concerns around access, control, reliability and security, are again stressed within Crook's 2008 BECTA report. According to Crook, students publishing in an open arena, with an audience and possibilities of exchange, means that educators need to consider possible consequences of this openness. In 2012, McLeod comments that school management in many schools are still "*struggling to balance the need to technologically empower students with countervailing organizational concerns regarding safety, respectful behavior, and the law*." (p. 1) McLeod (ibid) offers a more balanced, if liberal view on the issue of e-safety and offers some pragmatic advise. He urges schools to focus on people's behaviour rather than the tools when considering blocking mobile phones, *Google*, *YouTube*, wikispaces, etc. He provides an interesting analogy to consider:

> Why are you penalizing the 95 percent for the 5 percent? You don't do this in other areas of discipline at school. Even though you know some students will use their voices or bodies inappropriately in school, you don't ban everyone from speaking or moving…Instead, you assume that most students will act appropriately most of the time and then you enforce reasonable expectations and policies for the occasional few that don't…Just as you don't put entire schools on lockdown every time there's a fight in the cafeteria, you need to stop penalizing entire student bodies because of statistically infrequent, worst-case scenarios. (McLeod 2012, p.1)

McLeod (2012) advises that schools never promise 100 percent safety and instead recommends that schools implement sensible policies and procedures, alongside training that teaches students how '*to navigate the complex, "unfiltered digital information spaces*" (online). He urges schools to avoid

'walled garden' approaches to e-safety that may limit opportunities for serendipitous learning connections.

2.4.6. Key Barriers to Teachers' Integration of Online Technologies

In 1981, Cross, a thought leader on adult learning, classified three main barriers to adults' participation in learning; situational, dispositional, and institutional barriers. A fourth barrier is added for the purposes of this research – technological barriers. These barriers are useful in framing a discussion on barriers to teachers' use of online technologies in their continuing professional development or classroom practice. The discussion that ensues is structured according to this four-part classification of barriers.

2.4.6.1 Situational Barriers

Situational barriers in the context of this discussion refer to a teacher's situation at a particular time in life. They include: lack of time owing to job and home responsibilities, financial, work commitments, and/ or transportation problems. Online learning in professional development of teachers is rapidly becoming a preferred model for participants according to Holmes, Signer and MacLeod (2010), the online environment incorporates a level of convenience for the participant, as it can eliminate the need for travel, childcare, and scheduled class sessions. The benefits of online CPD discussed in the literature include convenience, access to online learning communities, and 'any time, anywhere' access to facilitate teachers' schedules and preferences. Family commitments and overcoming geographical issues was cited by Sun, Lin and Yu (2007); Lauer, Stoutemyer and Van Buhler (2005); Yang and Liu (2004) as barriers to engaging in professional development. King (2002) highlighted the potential of blended courses for teacher education and found that technical difficulties experienced were compensated for by face-to-face communication and the inconvenience of travelling to classes was compensated for by anytime, anywhere online accessibility, and convenience. Teacher training, and state and federal government restrictions on the possibilities of using online or blended courses for students were identified as significant situational barriers, by Picciano and Seaman (2009) to the classroom use of technology.

2.4.6.2 Dispositional Barriers

Dispositional barriers refer to attitudes towards learning and how technophobic or not, for example, teachers might be. These include; lack of confidence, inhibition, age, and predisposition to new ways of teaching and learning. It also relates to the way in which the underpinning philosophy of education (educational disposition) impacts on the integration of technology. Judge (2013) found that even having attended training, teacher confidence and belief in their ability to integrate ICT in their curriculum delivery remained a barrier to ICT usage. Picciano and Seaman (2009) highlight concerns about online courses including quality of courses, and the need for students to have discipline and self-direction in order to succeed in online courses. They also reference teachers' and school administrators' acceptance (or lack thereof) of the legitimacy of online courses.

Harris (2005) identified two primary reasons why technology integration efforts are perceived to have failed in education: technocentrism and/ or pedagogical dogmatism, that became the underpinning educational dispositions. Technocentrism places technology as the overriding focus within the learning environment, rather than focusing on how best to assist students' learning through a student-centred model. Harris (ibid) urges educators to shift the focus from the learning tools to the "*what and how*" of learning. The second reason for technology integration failure is attributed to pedagogical dogmatism, where Harris identifies a confusion around technology integration for the purposes of teaching and learning; and technology as a means by which educational reform can be made possible. In operational terms, one notion does not necessarily imply or require the other, and it is time for us to choose which of these two emphases will be our primary agenda. Harris (ibid) encourages educators to use educational technologies in a more student-centred, authentic and problem-solving way, encouraging higher-order thinking skills and practices. Both of these approaches have implications for the role of educators in technology integration efforts.

Yuen, Yaoyuneyong and Yuen (2011) found, in support of prior research by Ajjan and Hartshorne (2008) and Crook (2008), that there was a gap between teachers' positive perceptions of the usefulness and applicability of Web 2.0 tools and their integration of these tools in their teaching. This further highlights the lack of professional development that goes beyond technology skills to include training on mentoring, peer collaboration, and lesson design, as a barrier. Teachers require training in order to feel more comfortable integrating technology in their teaching. Time to attend training along with appropriate planning, was identified by Lawless and Pellegrino (2007).

2.4.6.3 Institutional Barriers

Institutional barriers are those associated with the learning institutions, including inconvenient scheduling of activities, compulsory attendance, restrictive locations, and lack of flexibility in student support services and resources at the institutional level. It may also include policies that restrict technology usage and/ or a technophobic culture within the institution.

A critical barrier to teachers' integration of technology is a lack of institutional support for the inclusion of technology. Buabeng-Andoh's (2012) literature review of factors affecting technology integration in teaching included teacher training, and the fact that ICT is not mainstreamed in school, as barriers to integration. In addition, the rigid structure of traditional educational systems, restrictive curriculum and traditional assessment requirements were cited in this review. Furthermore, Allen and Seaman (2013) reported online course development and purchasing costs as a barrier in some institutions to engagement within online education, as many schools are funded, based on the number of students in face-to-face attendance at K-12 institutions. Su (2009) categorises barriers into first-order barriers (available resources) and second-order barriers (teacher pedagogical and psychological beliefs). Su (ibid) also recommends fundamental change management in relation to effective technology integration in K-12, as well as highlighting the importance of

defining a vision of effective integration, providing administrative support and teacher professional development.

2.4.6.4 Technological Barriers

Technological barriers include poor technological infrastructure, lack of computers, courseware, digital skills, high costs or low levels of technical support that discourage teachers from participating in educational activities.

School heads and teachers in the European Commission (2013a) report on ICT usage in schools commented that insufficient ICT equipment (especially interactive whiteboards and laptops) is the major barrier to ICT use across the EU-27. Exploiting new technology tools for creative expression in schools may be more difficult than it first appears and research is limited to support best practice. Within the IESD (2012) study, low-level adopters and non-adopters of mobile technology cited cost of mobile technologies (64.7 percent) and concern with security/ theft (47.1 percent) as the most significant barriers for using mobile technology for student instruction in the US.

According to Sterling (2008), school content must address specific learning objectives; these learning objectives are subject to time constraints; technology can increase or intensify classroom management; schools are heavily invested in print and often limit access to online media tools; and teachers have limited models for integration of online technologies in their teaching. Finally, Buabeng-Andoh's (2012) review of the literature includes old or unmaintained hardware and lack of suitable software, low levels of access to technology hardware, software, and the Internet, as well as a lack of technical support, as barriers to technology integration.

The Hermes project in Ireland (2003-2008), sponsored by the Department of Education and Science (DES) in conjunction with the National Centre for Technology in Education (NCTE) involving 2,500 children and up to 130 teachers in nine schools in Dublin set out to investigate the feasibility of installing a Thin Client based broadband wireless network in schools. The goal

of the project was to provide a centrally managed network in order to provide a reliable technology infrastructure for schools as well as supporting the pedagogical practice and technology integration in these schools. The findings of this very important research noted that the Hermes initiative removed many of the barriers to technology integration. As teachers' confidence increased in the Hermes infrastructure and systems, so too did their competence through partaking in Hermes training courses, and their subsequent integration of ICTs in their teaching. Judge (2009)

Effective technology integration in K-12 education is not an easy task. Insufficient hardware and technical support "*created a condition of unpredictable unreliability which acted as a deterrent to ICT usage*" according to Judge (2013, p. 19). Su (2009) urges educators to acknowledge the change that technology has provoked, in order to assist teachers in effectively using new technologies in their teaching and learning to enhance student learning. Availability of technology resources is not sufficient to achieve integration and a clear understanding of the barriers preventing effective technology integration is necessary. Barriers identified in Su's (ibid) literature review include lack of time to learn, class time to use, access to technologies, training, technical, administrative or social support, funding, control over materials, motivation and social awareness, incompatibility with current assessment practices, vision and school culture.

2.4.7. Claims Regarding the Potential or Need for Integrating Online Technologies in Education

According to the European Commission (2013a), ICTs affects the way we work and live, particularly in terms of how we access knowledge, socialise, communicate with each other and collaborate, and adds that "*Such daily and easy access to all these exciting opportunities radically changes the environment, habits and expectations of young generations"* (p.13). Furthermore, UNESCO (2009) states that Information and Communication Technologies (ICT) have the potential to increase learning opportunities and enable policy-makers and educators to improve teaching and learning required by information societies.

Web 2.0 technologies have transformed the Internet from a medium where information is communicated and consumed, to a sphere where content is created, shared, remixed, repurposed, and exchanged. These technologies support opportunities to harness the collective intelligence of users from around the globe. Students can interact with other learners; share and gain from shared experiences, and construct their own knowledge. According to Yuen, Yaoyuneyong and Yuen (2011), Web 2.0 technologies afford teachers the opportunity to empower their students, through the assortment of new learning tools and mediums. The claims around the potential of Web 2.0 and social media technologies include education transformation, anytime anywhere learning (Kennedy 2012), students' familiarity with these technologies in their lives outside school, facilitation of student-centred learning, communication and collaboration possibilities for 21st century learning, resource availability, etc.

The potential of Web 2.0 technologies to facilitate and enhance learning is discussed widely in research articles and studies. The majority of literature available on Web 2.0 and social media is in the area of higher education. In addition, most of the available literature speaks to the virtues (as opposed to the vices) of integrating Web 2.0 and social media in education. Tess (2013) carried out a review of the literature in relation to the role of social media in higher education and concluded that social media is transforming the ways students communicate, collaborate, and learn in higher education. But what does the literature reveal about Web 2.0 technologies and social media integration at other levels of education?

Social media technologies are said to offer possibilities for teachers and students with disabilities. The US-based National Center for Technology Innovation (NCTI) perceives social media technologies as great "*equalisers*", facilitating young people with disabilities, already at risk of being isolated educationally and socially, to connect with the world in ways that have not been possible before. (NCTI 2007) Brigadoon, an island developed in *Second Life* by a researcher to support group of Asperger's Syndrome students, is a good example of how technology can be used to support specific learning needs.

(NCTI 2007) Despite the fact that there are strong indicators of potential for students with disabilities, this potential has yet to be fully leveraged.

The British Educational Communications and Technology Agency, (BECTA) in the UK commissioned a report on the current literature and thinking into Web 2.0 technologies for learning at Key Stages 3 and 4. (Crook, 2008) This report highlights four potential benefits of integrating Web 2.0 technologies in education; inquiry, literacies, collaboration, and publication. Web 2.0 technologies have the potential to empower students as independent learners but also challenge teachers and students to foster skills of inquiry, exploration and questioning required for these new media. New forms of literacies need to be developed, not just digital literacies and competencies that enable teachers and students to develop creative "*digital artefacts*" but also "*critical literacies*" necessary for individual and peer critiquing of online resources. Web 2.0 also provides educators with a set of tools to develop and foster collaborative learning environments and communities. Leadbeater (2008) and Surowiecki (2004) are cited here as arguing that human '*crowds*' are key to innovative thinking and problem-solving. Keen (2007), cited in Crook (2008), on the other hand contends that this creates a democratisation of knowledge that flattens expertise and disorientates researchers. Finally, Web 2.0 technologies, or the "*read-and-write Web*", provide opportunities for publication and viewing of work online. Therefore, Web 2.0 technologies offer both space and an audience within the public sphere for authentic learning.

According to a study conducted by IESD (2012), educators believe that mobile technologies have the potential to engage students (67.6 percent), support interactive learning (54.7 percent), and facilitate the personalisation of instruction to meet differentiated needs of students (42.9 percent). Mobile applications (or mobile apps) are software applications designed to run on smartphones, tablet computers and other mobile devices. They are usually available through application distribution platforms, which are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store. Furthermore, within this IESD study (ibid), educators ranked the following '*apps*' as being particularly beneficial to student

instruction: digital textbooks (68.4 percent), content creation tools (51.9 percent), and student productivity tools (51.3 percent).

In contrast to the positive claims in the literature, Cuban Sewyn and others offer opposing views. In *Teachers and Machines: The Classroom Use of Technology Since 1920*, Cuban (1986) assesses efforts to integrate technology, specifically film, radio, and other technologies, into US classrooms throughout 20th Century USA and posits that these attempts, initially hyped as potential in transforming education by enthusiastic policy makers, have failed in practice due to barriers including policy, infrastructure, teacher training and how teachers use these '*machines*' in their classrooms. These trends, themes and barriers continue to be relevant today.

Cuban's (2001) *Oversold and Underused* publication examines early childhood, high school, and university classrooms in Silicon Valley. Cuban found that students and teachers use technology less in classrooms than at home, and teachers' use of computers for instructional purposes is more infrequent and unimaginative (less than 10% of teachers use technology at least once per week). In addition, no evidence was found that technology increased student achievement. Here Cuban challenges the belief that technology use leads to educational transformation and recommends that administrators collaborate with teachers in implementing technology. Technical support and professional development are also recommended.

Cuban's blog (http://larrycuban.wordpress.com) continues to question the assumption of pushing popular technology gadgets into schools without due regard for the problems or challenges that need to be solved: "*All too often, the related question being asked is not 'what challenges are we trying to solve, and what approaches and tools might best help us solve them?', but rather, "we know what our technology 'solution' is, can you please help us direct it at the right problems?"*(Cuban, online),

In *Education and Technology: Key Issues and Debates,* Neil Selwyn discusses a number of current considerations in educational technology. He also

questions the dominant optimistic belief that technology can be life-changing, and argues that a more "*socially circumspect analysis of education and technology*" is needed. (Selwyn 2011, p.32) Although Selwyn accepts that the Internet has increased the availability of learning, he also opposes the view that technology makes education fairer/ equal and increases participation for all. Although he discusses that the role of the teacher may become diminished over time, he argues that the teacher's role will never become redundant. Selwyn contends that there is limited proof that technology really enhances learning, and the evidence that exists is frequently based on assumptions, personal beliefs and opinions as opposed to research-based. Selwyn also points to the past failures of technology innovations in education and urges us to learn from these.

EU Kids Go Online, a report funded by the European Commission's Safer Internet Programme, balances the increase in European children using the Internet (75%) celebrated by many with the vulnerability of children's exposure to "new forms of harm". (Livingstone and Haddon 2009, p. 3) The report's many recommendations include the need to raise awareness among younger children, to focus on kids' knowledge of the online environment, providing coping strategies after exposure to risk, tackling boys and girls differently, and maintaining awareness-raising as new technologies emerge through mobile platforms (peer-to-peer content and services).

Holland and Judge (2013) in their critical analysis of the literature, highlighted many challenges in the integration of online technologies in higher education: limited access to or use of Web 2.0 technologies, digital literacy and skills, funding, safety and privacy concerns and knowledge on effective integration in teaching and learning environments. Of particular interest is their discussion on the "openness" and "informality" that Web 2.0 facilitates, and possible litigious implications of intellectual property and copyright infringement. The informality in Web mentality provided for by these new technologies are particularly leveraged by the younger generation who freely share, publish personal information via SNSs. Holland and Judge urge investigation in higher education in order to identify ethical and other risks and cultural effects in the use of Web 2.0 technologies. Time management identified

by Allan (2007) in a study on the 45 eLearners experiences of three networked learning communities in UK universities (2001-2002) identified the time required for networked learning and the requirement for learners to adapt to time demands as presenting further challenges to learners engaging in online learning. In particular leaving time to reflect "*slow time*" rather than being swamped by "*fast time"* (online activities, collating information from multiple sources, etc.) discussed by Eriksen (2001) and cited by Holland and Judge (2013). The issues, challenges and tensions discussed herein are worth bearing in mind with regard to online technologies and social media in education.

2.4.8. Standards in Online Technologies

Standards for the design and integration of technology, social media and open-source learning objects vary considerable across countries, resulting in differing levels of quality of online learning resources made available for use in teaching and learning. Standards of practice for teaching and learning, regarding curriculum and assessment, is a topic of great interest, particularly in the highly regulated US educational system. No standards exist for European educators in the integration of technology in teaching and learning.

US standards for technology integration have been formulated by the International Society for Technology in Education, (ISTE®). ISTE is the main membership association for educators engaged in advancing learning and teaching through technology in K-12 and teacher education. ISTE has created National Education Technology Standards (NETS) for teachers, students, administrators, coaches and teachers of computer science. These standards are used for evaluating the skills and knowledge educators need to teach, work, and learn in an increasingly digital world. (ISTE Website) Teachers are required to: 1) use their knowledge of subject matter, teaching and learning, and technology to facilitate and Inspire student learning, creativity and innovation in face-to-face and virtual environments: 2) design, develop, and evaluate authentic learning experiences and assessment integrating up-to-date tools and resources to optimise learning in context and to develop the knowledge, skills, and attitudes identified in NETS·S: 3) exhibit knowledge, skills, and work processes

representative of an innovative professional in a global and digital society: 4) promote and model digital citizenship and responsibility: 5) continuously improve their professional practice, model life-long learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

The Common Core State Standards (CCSS) Initiative was announced on June 1, 2009 - (http://www.corestandards.org). Before CCSS, every state had its own set of academic standards. Forty-five of the fifty states in the United States are members of the initiative, with the states of Texas, Virginia, Alaska, Nebraska and Minnesota not adopting the initiative at a state level. On June 2, 2010, Common Core State Standards were released for Mathematics and English Language Arts, with a majority of states adopting the standards in the subsequent months. States are planning to implement the CCSS initiative by 2015 by basing at least 85% of their state curricula on the Standards. In reviewing some of the English Language Arts curriculum, many of the listed "*standards*" call for new technologies to support these standards as outlined in Table 2.1. Many of these standards have implications for the use of technology, for example, in Reading Anchor Standards K-5, students must use technology to write and publish text, comment and collaborate with their peers, e.g., working together to achieve a shared outcome, e.g. wiki entry. Or as in Writing Anchor Standard Number 8, students are required to gather information from multiple digital sources, including the Internet, and use advanced searches and tools to avoid plagiarism.

Table 2.1: K-12 Common Core State Standards for English Language Arts and Literacy in History, Social Studies, Science, and Technical Subjects.

Reading Anchor Standards (K-5)		
Strand	**Standard**	**Technology Implication**

Production and distribution of Writing	Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others	Students must use technology to write and publish text. Includes peer-to-peer interactions, e.g. commenting and collaboration, e.g. working together to achieve a shared outcome, e.g. wiki entry.
Research to Build and Present Knowledge	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.	Students have to gather information from multiple sources, including websites.

Speaking and Listening Anchor Standards (K-5)		
Strand	**Standard**	**Technology Implication**
Comprehension and Collaboration	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.	For formative and summative assessment, facilitate teacher to capture student's spoken responses (including dialogue) for evaluation and feedback.
Presentation of Knowledge and Ideas	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.	Need to enable students to create, deliver and be reliably evaluated on their ability to present information.

Writing Anchor Standards (6-12)		
Strand	**Standard**	**Technology Implication**
Production and Distribution of Writing	Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.	Students must use technology (including the Internet) to develop and publish written content. They must also engage in peer-to-peer interactions, and group collaborative work to produce a joint outcome, e.g. wiki entry.

Research to Build and Present Ideas	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.	Gather information from multiple digital sources, including the Internet. Use advanced searches. Use tools to avoid plagiarism.

In an effort to enable the potential of ICT for learning and self-empowerment, UNESCO (2009) has also created a standardised framework, which includes political commitment, infrastructure, teaching staff development, curriculum, usage, participation, skills and output, outcomes and impact, and specifications for ICT measurements and indicators. Indicators developed include: average number of computers per education institution, proportion of computers connected to the Internet, average number of hours per week of ICT use in class and proportion of primary and secondary-school teachers trained via ICT-enabled distance education programmes. This framework hopes to enable data collection through standardised international surveys, thus enabling policy-makers to review progress over time and compare their results with those of other countries. (UNESCO 2009) UNESCO's *Guide to Measuring Information and Communication Technologies (ICT) in Education* is an attempt to establish internationally standardised concepts and indicator measurement specifications to ensure consistent use and interpretation of ICT in education for global policymakers, statisticians, researchers, experts and statistical institutions.

Therefore, a number of important standards have been created either in relation to technology in education, (UNESCO), teacher professional development (ISTE) or general educational standards in the case of common core state standards (CCSS) in the United States. These standards are particularly interesting in that their educational strands directly state or imply that Web 2.0 and social media technologies are needed in order to comply. This will bring about change in the landscape of technology integration and will have implications for teacher professional development as well as school policies.

2.5 Conclusions

This literature review set out to present and critique the existing research on Web 2.0 and social media use in the personal lives, professional development activities and classroom practice of primary and second level teachers. It began by explaining some of the key concepts associated with Web 2.0 and social media technologies in learning. It then described the landscapes of Web 2.0 and social media in teachers' personal lives, professional development and classroom practice. Discussion followed around the eight themes of: access to and infrastructure in social media integration, trends in types of social media being used, trends in models of social media integration, key influences on teachers' integration of social media, the key tensions that impact on teachers integration of social media, key barriers to teachers' integration of social media, claims regarding the potential or need for integration of social media and finally standards in social media integration.

The use of Web 2.0 and social media in education is relatively new and mainly tested in small-scale studies within the context of K-12 Education. Although online learning is rising in popularity in the US, research is limited in the area of online teaching and learning in the K-12 context. (DiPietro, Ferdig, Black and Preston 2008) There is also limited research on the use of social media in teaching practices in general. (Laire, Casteleyn and Mottart, 2012) While the infrastructure to support social media use in K-12 education may exist, this sector has been slow to adopt Web 2.0 and social media as an educational tool. A multitude of factors exist for its non-integration including school policies blocking social media, broadband speed, teacher comfort and competence in using these new technologies in classrooms, etc. The barriers were discussed using Cross' (1981) framework of situational, dispositional, institutional and a fourth one was added to take account of the technological barriers. Some interesting tensions emerged in the literature, which included the *digital native* and *digital immigrant* debate, *living technologies* and *learning technologies* as well as e-safety concerns.

A thorough search through the literature revealed some gaps with regard to research. Firstly, while there is a good deal of literature presenting the

benefits of social media and online technologies in general and in its adoption in education, very little is presented in relation to online technology integration within the professional development and practice of teachers. The research undertaken in phase 1 of this study attempts to respond to this, by unearthing the experiences of teachers undertaking online CPD programmes in Ireland. Secondly, more research is needed in the area of social media in the context of K-12 education, as the majority of recent research focuses on social media integration within the Higher Education sector. Furthermore, there is very little empirical evidence of factors impacting on social media integration in education. Therefore, there is a need for a factorial analysis of the differing dimensions of teacher profiles and educational contexts (such as: teachers' age, years of teaching experience, gender or school type, school policy, extent of Internet access), that impact on the use of social media in personal lives, for professional development and in turn the integration of social media technologies in classroom practice. The research undertaken in phase 2 of this study specifically attempts to respond to this area.

Finally, in line with comments by Sistek-Chandler (2012), research is needed to ascertain if engagement in social media leads to deep learning in an educational context. There is also a need for researchers to examine the dichotomy between the high degree of adult and youth engagement in social media in their personal lives, and the low levels of transition towards the use of social media in educational contexts, from the perspective of learners. These concerns are beyond the scope of the study undertaken for this research, but should be prioritised in future research.

Chapter 3 Research Design and Methods

3.1 Introduction

This chapter articulates the research design process and methodology of this mixed methods study. The research investigates teachers' usage of online technologies in their personal lives, to support continuing professional development (CPD) and/ or in their classroom practice in Ireland and the United States. The research was conducted in two phases. Phase 1 explored Irish primary school teachers' perceptions of online CPD, specifically relating to the immersed online CPD summer programmes initially offered in Ireland in 2007, and its impact on the integration of technology in classroom practice. Phase 2 examined K-12 teachers' use of online technologies, mainly Web 2.0 and social media, in their personal lives, for continuing professional development, and in their classroom practice in the US. The study also examined US teachers' attitudes, opinions, confidence and concerns regarding the integration of these new technologies in education.

This chapter details both phases of the research project, beginning with the justification for adopting a mixed methods methodology and an explanation of the post-positivist philosophy that underpins this approach. It continues with descriptions of the specific mixed methods designs and sampling techniques used. A description follows of the data collection tools, indicating how the research questions and/ or hypotheses are addressed through the online surveys, focus groups and/ or interviews, as well as the rationale for using these instruments. Data analysis procedures, ethical issues including validity and reliability, and the limitations of this study are also discussed.

3.2 Justification for Mixed Methods Methodology

Mixed methods research has risen in popularity since the early nineties, advancing on what Alastalo (2008) refers to the four "*moments*": the crisis of representation, the post modern period of experimental ethnographic writing, the post-experimental moment and the future, before mixed methods was established, heralding a more pragmatic approach to research methods. According to O'Leary (2010), mixed methods utilises aspects of both qualitative and quantitative traditions and helps to overcome shortcomings of both by allowing for the use of inductive and deductive reasoning, by making findings more generalisable (through statistical analysis) and/ or by adding qualitative insights or depth thought "*inclusion of dialogue narratives, and pictures"* (p.128), and by facilitating triangulation through multiple perspectives and multiple methods.

Creswell (2012) notes that triangulation allows researchers to improve their research by collecting and integrating different kinds of data bearing on the same phenomenon. In this study, the quantitative and qualitative sources of the data make up two of the three points of the triangle and the phenomenon of online technologies integration comprises the third. Therefore, the quantitative and qualitative perspectives gathered within this mixed methods study were necessary in order to triangulate the extent of, and attitudes to, online technologies usage in Irish and US education.

3.3 Philosophical Underpinning of Mixed Methods Approach

The Mixed Methods approach in this research was underpinned by a post-positivist philosophy, where the ontological position is that of critical realism, and the epistemological perspective is that knowledge gained in this study is considered to be subjective (and contextual) in nature.

Positivists hold the belief that one reality exists, and that knowledge is objective. According to Guba and Lincoln (2005), the positivist philosophical paradigm stance is that objective accounts of the real world can be provided. Therefore, the nature of knowledge can be verified by developing hypothesis,

and verification of the hypothesis is established mainly through "*scientific experimental*" approaches, using quantitative methods. (Guba and Lincoln 2005) Gray (2006) comments that within positivism, the social world that exists is external to the researcher. Guba and Lincoln (2005) note that the researcher acts as a "*disinterested scientist*" taking an objectivist stance. As a result, positivism employs scientific methods to capture social phenomena and relies predominantly on quantitative, statistical information generated from data garnered through objective inquiry, to create "*true*" facts or universal laws. Therefore, according to Robson (2000), within positivism, universal laws are developed, and, generalisability is possible. Criticisms of positivism hold that people are treated as scientific objects and not seen as partners whose views are respected and valued. Greenwood and Levin (2005) acknowledge that positivism persists, and criticise positivist approaches within social research, as they contend that they conflict with producing valid and meaningful interpretations of social actions in social research.

According to Robson (2000, p.24), "*People, unlike the objects of the natural world, are conscious, purposive actors who have ideas about their world and attach meaning to what is going on around them. In particular, their behaviour depends crucially on these ideas and meanings*". Whereas positivists maintain that one reality exists, post-positivists believe that reality does exist, but it can be known only imperfectly because of the multiple realities that exist for individuals. No individual can see the world as it really is because of the biases (values, beliefs, perceptions) brought to all observations. Post-positivists believe that the researcher can influence, and be influenced by, what is observed; in other words, their theories, background knowledge and values can influence the research. Robson (2000) contends that post-positivists believe that a reality does exist but also that this reality is influenced by the researcher's experience and thus knowledge that emerges is subjective in nature.

Therefore, the ontological position underpinning the mixed methods model is that of critical realism where reality is "*imperfectly and probabilistically apprehensible*". (Guba and Lincoln 2005, p.193) The epistemological position is that knowledge is subjective, and is generated

through critical appraisal of multiple sources. The methodological position is that of mixed methods, utilising both qualitative and quantitative methods. The axiological perspective accepts that many "*goods*" may emerge from the research, and that "*propositional knowing about the world as an end in itself, is intrinsically valuable*". (Guba and Lincoln 2005, p.198) Table 3.1 presents the post-positivist paradigm of this research, adapted from Guba and Lincoln (2005).

Table 3.1: Basic Beliefs in this Research (Ontology, Epistemology, Methodology and Axiology).

Issue	Post-positivism	Current Research Adaptation
Ontological position	Critical realism –"real" reality but only *imperfectly and probabilistically apprehensible*	Underpinned using the mixed methods
Epistemology	Modified dualist/ objectivist; critical tradition/ community; findings probably true	Knowledge is subjective, and generated through critical appraisal of multiple sources
Methodology	Modified experimental/ manipulative; critical multiplism; falsification of hypothesis; may include qualitative methods	Mixed methods utilising both qualitative and quantitative methods
Axiology	Propositional knowing about the world is an end in itself, and is intrinsically valuable	Acceptance that many "*goods*" may emerge from the research

Guba and Lincoln (1994) attest that while positivists and post-positivists sometimes argue that these paradigms are commensurable, at a paradigmatic, or philosophical level, they are not. However, within each paradigm, mixed methods approaches make perfectly good sense. Guba and Lincoln (1994) cautiously agree that by blending elements traditionally associated with the methodological approaches within each paradigm, one can

create the best of both worlds. According to Creswell (2012, p. 534), mixed methods research has become popular as the newest development in research methods and approaches to "*mixing quantitative and qualitative research*". It is well documented that mixed methods provide a "*powerful mix*" (Miles and Huberman, 1994, cited by Creswell, 2012:42) and develops a "*complete picture*" (Greene and Caracelli, 1997:7, cited by Creswell, 2012). Leedy and Ormrod (2010, p. 259), citing Bryman (2006) and Greene, Caracelli and Graham, (1989) concluded that the positive rationale for using mixed methods approach includes; completeness; the complementarity of both approaches, the ability to generate hypothesis and test these (where relevant), as well as the research tools and strategies that make triangulation possible through resolution of puzzling findings. Table 3.2 belows summarises the mixed methods approach of this study.

Table 3.2: Mixed Methods – Paradigm, Methodology and Approach of the Research.

Paradigm	**Post-positivist**	**Quantitative and Qualitative Methods**
Methodology	Multiphase Mixed Methods	
Approach	Phase 1: Exploratory Sequential Mixed Method	• Qualitative: Interviewing, Focus Group • Quantitative: Large Scale Survey (Pilot and Live)
	Phase 2: Explanatory Sequential Mixed Method	• Quantitative: Large Scale Survey (Pre-Pilot, Pilot and Live) • Qualitative: Interviewing
	Data Types:	• Quantitative data from online surveys • Qualitative data from Interviews and Focus Groups
	Analysis:	• Statistical analysis, with • descriptive and analytical statistics • Thematic / coding.

3.4 Mixed Methods Design

There are many different ways in which a researcher can combine qualitative and quantitative methods. Creswell (2012), presents six mixed methods designs for consideration: the convergent parallel design, the explanatory sequential design, the exploratory sequential design, the embedded design, the transformative design, the multiphase design. In convergent designs, researchers collect both quantitative and qualitative data in parallel or simultaneously, and give equal weight to both sets of data. Explanatory Designs usually encompass two design phases, but quantitative dominates the first phase, focusing on generating statistical data. An exploratory design involves two phases, the initial phase focusing more on qualitative than quantitative data. Embedded designs collect quantitative and qualitative data at the same general timeframe, although one approach dominates. (Leedy and Ormrod 2010, p. 260) The two additional mixed methods aproaches; the transformative design and the multiphase design are worth description. Transformative design is a little more complex than the previous four designs outlined above. It uses a transformative framework or lens to encase one of the other four designs (convergent, expanatory, exploratory, or embedded). According to Creswell (2012, p. 546), the objective of this framework is "*to address a social issue for a marginalized, or underrepresented population and engage in research that brings about change*". Creswell uses a sequential explanatory mixed methods study by Buck, Cook, Quigey, Eastwood and Lucas (2009) to illustrate this transformative lens. This study examined the attitudes of 89 African American girls towards science through quantitative means. Focus group interviews (qualitative examination) followed and these were categorised into themes. In the concluding phase, the authors use a feminist lens, calling for reform in instructional strategies.

The sixth mixed methods is the multiphase design. This design is a complex design building on the initial four designs (convergent, explanatory, exploratory, and embedded), and may employ concurrent or sequential design. It is typically used to research a problem through a series of phases or separate studies. The individual phases are considered to be mixed methods and the strength of multiphase mixed methods design is to address incremental research questions that all advance "*one programmatic research objective*" (Creswell

2012, p. 547) Multiphase research projects facilitate better understanding of an overall research objective, one phase should lead to another, thus building on or informing the other.

A number of cognate studies on online technologies and social media have used mixed methods as the research design. These are discussed briefly below. Holmes, Signer and MacLeod (2010) used a mixed methods approach to look at the efficacy of a 5-week distance-learning model for in-career development of K–12 teachers. The study examined experiences of teachers and analysed participant surveys to get an appreciation of teacher satisfaction, learning, and quality of interaction in online professional development courses. Quantitative data in the form of surveys were analysed, while qualitative data was gathered from the open-ended survey items. Findings of the study showed that 88% of the participants claimed that the online course had direct applications to their classroom instruction. Therefore, Holmes, Signer and McLeod (2010) recommend the establishment of a sense of "*presence*" online, in terms of enhancing online professional development.

Tu's (2002) study also used mixed methods to examine the relationship between social presence and privacy with 51 US university students enrolled in a graduate program. Quantitative and qualitative methods were used to receive a better understanding of the relations of between social presence, privacy and text-based CMC (e-mail, bulletin boards and real-time discussion). Qualitative data comprised participant observation (in the classroom, the computer lab and through online asynchronous and synchronous class discussions), casual conversation, interviews and document analysis (messages, e-mail). Tu recommends that online learning environments allow learners to adjust their "*ideal*" levels of privacy in order to increase social presence and augment their online interaction.

Giordano's (2008) study used mixed methods to examine the long-term effects of a staff development model on PreK-12 teachers' dispositions and instructional practices of integrating the Internet into teaching. Surveys, administered three times over the three-year period, produced quantitative data

regarding concerns about the curricular innovation. Interviews yielded qualitative data and provided an understanding of participants' perspectives as well as their perceived changes in instructional practices as a result of the staff development. Findings of the study confirm that teacher-centred education when combined with existing teacher values, knowledge and behaviors, leads to sustained change in instructional practice and should be sustained by the system in which the teacher works. While these studies were conducted using a mixed methods research approach, none employed a multiphase mixed methods approach. The next section describes the multiphase mixed methods research design for phases 1 and 2 of the research.

3.5 Multiphase Mixed Methods Research Phases 1 and 2

In this study, multiphase design forms the overarching research design for the research carried out in two phases - phase 1: 2007-2008 and phase 2: 2011-2013. The phase 1 study employed an exploratory sequential design, while phase 2 leveraged explanatory sequential design. The multiphase design and the specific mixed methods design for both phases is discussed here. Data gathered in phase 1 (exploratory sequential design) led to, and informed the research questions for the phase 2 (explanatory sequential design) study. The fact that both phases took place over a period of four years warrants the multiphase research design (*Figure 3.1*).

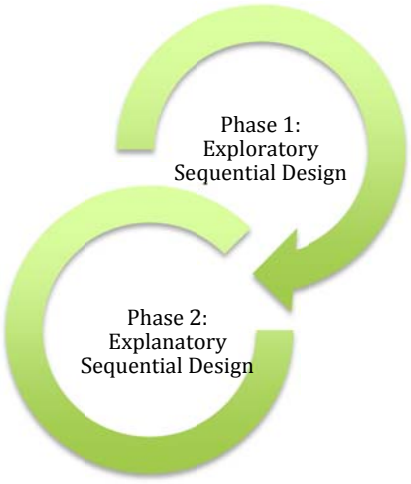


Figure 3.1: Multiphase, Mixed Methods Used in this Research

The Case Study model of research is used in many situations to increase our knowledge of individuals', groups' and organisation's social, political and related phenomena. Yin (2003) advocates qualitative case study to gain a better understanding of the case. Yin (1993) identified three types of case studies: exploratory, explanatory and descriptive. Exploratory cases are generally considered to be a lead into social research. Explanatory case studies may be used for doing causal investigations. Descriptive cases require a descriptive theory to be developed before starting the project. One criticism of case study methodology is that it depends on a single case and therefore cannot provide generalisable conclusions. (Tellis 1997) Case studies are bound by time and activity, and researchers collect detailed information using a range of data collection procedures over a period of time. (Stake 1995) Case Study was considered for this study, however, based on the fact that this research was phase-based in nature, with multiple stages within the two phases, case study was not deemed appropriate. In addition the defined nature of the phases (exploratory and explanatory phases) allowed the researcher to move more efficiently through the research phases. The exploratory sequential design employed in phase 1 allowed for exploration primarily through qualitative means, while the explanatory sequential design employed during phase 2 allowed for more focus on quantitative data collection and analysis. Mixed methods here provided more guidance and structure through both phases of this research.

3.5.1 Phase 1 Research Design - Exploratory Sequential Mixed Methods

Phase 1 research took place from September 2007 to June 2008, and used the exploratory sequential design, where qualititative data was gathered first through interviews and a focus group. This then informed the online survey research questions (which involved quantitative and further qualitative data collection and analysis), validatating and elaborating on the findings in the qualititative phase with a larger group of Irish primary school teachers. Phase 1 set out to explore Irish primary teachers' perceptions of online CPD, specifically relating to the immersed online CPD summer programmes offered in Ireland in summer 2007. The study set out to answer the following questions:

- What key factors have influenced primary school teachers' engagement in the online learning mode of CPD?
- What barriers (situational, dispositional, institutional, technological) exist in terms of primary school teachers' engagement in online learning?
- Has engaging in online courses influenced teachers' classroom practice? If so, how?
- As a result of engaging in online CPD courses, are teachers more likely to integrate ICTs into their curriculum delivery?
- What are the perceived positive and negative implications (from the perspective of various stakeholders) of using online learning to facilitate CPD?

In phase 1, a total of 83 primary school teachers along with a representative from each organisation, the National Council for Technology in Education (NCTE), the Irish National Teachers' Organisation (INTO) and the Department of Education and Science (DES) Inspectorate participated in this research project. The participants were chosen based on a number of factors. The three main stakeholders engaged in the development and support of CPD for primary teachers are the NCTE, INTO and DES, thus, each of these bodies put forward an individual to represent them in this research. In terms of the online survey participants, 200 teachers who completed an online summer courses in 2007 were invited to engage in this study through the INTO. The eight teachers chosen for the interviews (three male and five female) and the five focus group participants (two male and three female) worked in Dublin primary schools, and were selected based on varying years of teaching experience. Please refer to Appendices C and D for the Information Sheet for Participants and the Letter of Consent.

Respondents who had engaged in online CPD in the previous two years were selected for interviews and asked to complete the online survey, and those who hadn't were selected for the focus group.

3.5.2 Phase 1 – Data Collection Stages

Table 3.3: Phase 1 Multiphase Exploratory Sequential Design.

Multiphase - Exploratory Sequential Design	
Exploratory Sequential Design	Stage 1: Interviews Stage 2: Focus Group Stage 3: Pilot Online Survey followed by Online Survey Proper

The data collection in phase 1 of this research took place in three stages as outlined in Table 3.3 above. Stage one involved in-depth interviews with eight teachers who had engaged in online CPD during the previous two years. The semi-structured interviews contained open-ended questions as the interviewer set out to understand the factors affecting teachers' engagement in the online mode of CPD. Interviews were also undertaken with the DES Inspectorate, the NCTE and the INTO, in order to elicit the perspectives of online CPD course providers and government policy in relation to the subject. Appendix B outlines the interview questions used and Appendix C provides sample interview transcripts. Informed consent was received from the INTO only, and as this research operated by informed consent, the data from the other two sources could not be included for ethical reasons.

Stage two of the research was carried out using a focus group to examine the barriers for teachers engaging in this mode of CPD and to elicit the advantages and disadvantages of online CPD. Five teachers who had not engaged in the online summer programme attended. Participants differed in their years of teaching experience, confidence and technological abilities. Broad areas for discussion included: perceptions/ feelings towards the use of technology in online education and CPD; barriers to engaging in online CPD and positive and negative effects of online CPD. Appendix D outlines the research question areas for the focus group and Appendix E provides the transcript from the focus group.

Stage three of the research came about as a result of the researcher attempting to gain a richer insight into teachers' perceptions and experiences of the online mode of CPD and to elicit if the teachers' interviews were representative of a wider audience. The online data collection tool was sent to 200 teachers who had engaged in online summer programmes, in collaboration with the INTO. Seventy replies were recorded after two weeks of the survey going live. Participants differed in years of teaching experience, confidence and technological ability. The majority of respondents worked in mainstream primary schools (97%), while a minority worked in special educational needs schools (SEN) (3%). The questions posed approximated those in the teacher interviews. Table 3.4 provides a summary of the stages, timeframes, data collection tools and participants for phase 1.

Table 3.4:Phase 1: Stages of Data Collection – Summary.

Stage	Data Collection Timeframe	Data collection Tool	Participants
Stage 1	28th February 2008	Interview	8 Teachers
	26th February 2008	Interview	1 NCTE representative
	21st April 2008	Interview	1 INTO representative
	7th April 2008	Interview	1 DES Inspectorate
Stage 2	3rd March 2008	Focus Group	5 Teachers
Stage 3	7th February 2008	Pilot Online Survey	5 teachers
	26th May 2008 (live)	Online Survey	200 Teachers, 70 respondents
	9th June 2008 (offline)	Summary Results Online Survey	70 respondents

This phase focussed more on qualitative analysis of data, but used the quantitative data in stage three to validate and triangulate stage one findings. In addition, the qualitative data gleaned from interviews informed the subsequent quantitative and qualitative design of the online survey, and helped to clarify and

develop the original research questions. Appendix F is a copy of the online survey and Appendix G provides a summary of the results obtained.

3.5.3 Pilot

The phase 1 research approach, data collection tools and analysis used was invaluable in terms of the opportunity to pilot these and better inform the subsequent phase 2 research approach, data collection tools and analysis. It also facilitated and better enabled the author to develop and hone research skills and competencies in utilising the mixed methods approach including quantitative and qualitative data gathering and analysis in the phase 2 research, in particular, the focus on quantitative data collection and analysis.

In addition, some of the findings from phase 1 specifically that teachers reported being more likely to use ICTs in their classroom as a result of having attended the online summer programs informed the research question in phase 2 in terms of the transference of teachers personal use of online technologies and social media use to their use of these technologies for professional development and classroom practice.

3.5.4 Phase 2 Research Design - Explanatory Sequential Mixed Methods

Phase 2 research took place from September 2011 to April 2013. In explanatory sequential design, quantitative data is typically gathered first with a view to informing the research questions in the qualitative stage. The explanatory sequential design was used where quantitative and qualitative data was gathered sequentially in four stages. Stage one focussed on gathering quantitative data through an online survey. Stage one informed the in-depth qualitative interviews and data analysis stages in this research. Thus quantitative data informed the qualitative design and helped to clarify and develop the research questions for the follow on interviews.

Phase 2 research deployed an explanatory mixed methods research approach to examine online technologies and social media usage in the personal lives, professional development and classroom practice of K-12 educators in the USA. The following questions were investigated:

- What correlations exist between teachers' engagement in online technologies/ activities in their personal lives, for professional development and within classroom practice?
- What barriers exist to teachers' use of online technologies/ activities?
- Has engaging in personal use of social media influenced the likelihood of teachers using social media in classroom practice? If so, how?
- As a result of engaging in social media for CPD, are teachers more likely to integrate social media in their classroom practice/ curriculum delivery?

The study aimed to produce a rigorous analysis, through quantitative and qualitative examination, of the degree of infusion of online technologies, particularly social media, in the personal use, professional development and/ or classroom practice of US K-12 teachers. Over 1,800 US K-12 educators were invited to participate in the phase 2 online survey. In all, 632 educators (14 percent male and 86 percent female) took part. They varied in age, years of teaching experience, subjects taught across elementary, middle and high schools. Ten teachers (one male, nine female) took part in the follow up interviews. These interviewees gave their consent (through the final item on the online survey) to be contacted for a follow up interview. The interviewees were selected from those who responded that social media was not blocked in their schools, and of those invited to participate in the interviews, ten teachers responded.

3.5.5 Phase 2 – Data Collection Stages

Table 3.5: Phase 2 Multiphase Explanatory Sequential Design.

Multiphase - Explanatory Sequential Design	
Explanatory Sequential Design	Stage 1: Pre Pilot Online Survey (Quantitative) Stage 2: Pilot Online Survey (Quantitative) Stage 3 Online Survey (Quantitative) Stage 4 Interviews (Qualitative)

Phase 2 data collection took place over four stages (Table 3.5 above). Stage one involved a pre-pilot of the online survey to a sample population of 50 teachers in order to test the validity and internal reliability of the instrument. A small number of teachers were invited to partake in this pre pilot survey. Responses were received from 19 teachers. Stage 2 involved the deployment of the pilot survey to a population of 300 teachers, to test the online questions, survey usability issues and time to complete the survey. Responses to this survey amounted to 98 teachers. The data gathered contributed to the online survey proper being finalised and highlighted a number of issues relating to the online survey design which were capable of being changed before the final online survey went live. Stage 3 involved the deployment of the final online survey to the population of 1,800 teachers to ascertain their views in relation to the integration of online technologies and social media in their personal lives, professional development and classroom practice. The survey was made available to educators from January 15, 2013 to February 22, 2013. Stage four conducted follow up interviews with 10 teachers on the key factors, trends and issues emergent from the analysis of the online survey. The online survey and interview tools set out to qualify, examine, and further understand the factors affecting the integration of online technologies and social media in the personal lives, professional development, and classroom practice of K-12 US teachers. Table 3.6 provides a summary of the stages, timeframes, data collection tools and participants for phase 2.

Table 3.6: Data Collection and Analysis.

Stage	Timeframe	Data collection tool	Participants
Stage One	August 2012	Pre Pilot Online Survey	50 US Educators invited, 19 responded
Stage Two	November 2012	Pilot Online Survey	300 Educators invited, 98 responded
Stage Three	January 2013	Online Survey	1,800 Educators invited, 632 responded
Stage Four	April 2013	Follow up Interviews	10 Educators chosen from those who reported no blocking

3.6 Data Collection Tools Phases 1 and 2

Data collection tools used across both phases included online surveys and interviews. A focus group was also used in phase 1. Other tools that were considered for this research included observation, although given the scope and timeline of the project, as well as the research questions, observation as a data collection tool was regarded as not appropriate. In Phase 1, interviews, a focus group and an online survey comprised the data collection tools. While quantitative data was gathered in the online survey, it was mostly treated qualitatively in the data analysis phase. The interviews and focus group yielded rich qualitative data. In Phase 2 the data collections tools consisted of an online survey and follow up interviews across four stages of research.

3.6.1 Online Survey

The use of online questionnaires, web-based questionnaires or online surveys is becoming popular in research. It is a convenient data collection tool with access to a large population. (Gray, 2006) The online surveys for phases one and two were administered via the web. The survey in phase 1 was designed and implemented using 'Surveymonkey' and in phase 2 using HMH in-house survey software *Qualtrix*. They were piloted in advance and any issues that were raised in the pilot were addressed before the final surveys went "*live*". The advantages provided by survey research included the capacity to reach a large number of respondents, the ability generate standardised, quantifiable, empirical data and confidentiality and anonymity. The challenges included getting a representative sample to respond, requirement for proficiency in statistical analysis, and only getting answers to the questions asked. Both online surveys followed the same procedure as recommended by O'Leary (2010): development of the online survey instrument, piloting, modifying and refining, implementation and data analysis. Open-ended responses were gathered within the survey, but the focus for phase 1 was to validate the findings of the earlier stages of interviews and focus group. For phase 2, the intent of utilising a survey was to gather statistical information with a view to gaining further quantitative information on the phenomenon. Both surveys were designed to take no longer than 20 minutes to complete and this was validated at the online survey pilot stages. The survey in phase 2 was also tested for user fatigue, as some of the questions had multiple

elements. This resulted in the reduction in the number of elements, and/ or the automated, randomised re-ordering of statements, within particular questions, to ensure user fatigue would not compromise the statistical analysis process.

3.6.1.1 Online Survey Phase 1

In phase 1, *surveymonkey.com* was used as the platform to launch the survey, and its deployment was mediated through the INTO. The questions comprised closed and open-ended questions, using multiple-choice tick boxes and open response text boxes. Detailed data was provided in an Excel spreadsheet and was analysed quantitatively and qualitatively in terms of the research questions, and cross-referenced. One of the issues with online surveys is anonymity, where respondents can be identified via their e-mail address. This did not cause a problem, as the respondents contact details were not accessible to the researcher. However, a number of participants provided their e-mail address voluntarily for clarification purposes if necessary.

3.6.1.2 Online Survey Phase 2

In phase 2, the online survey was deployed using the HMH proprietary online survey tool Qualtrix. This tool is capable of outputting data that can be readily interpreted by SPSS. The questions comprised mainly closed questions, using multiple-choice tick boxes and text boxes for the 'other' choice boxes. Appendix H provides a copy of the online survey for reference. Detailed data was output in both Microsoft Excel and SPSS spreadsheets and was analysed quantitatively in terms of the research questions, and cross-correlations. Data collected comprised background information such as job title, subjects taught and school level; teachers' access to social media in their personal, professional development and classroom domains; teachers' opinions and attitudes towards social media in education and additional information for classification purposes only, such as gender and school area population. Appendix I provides a summary of data gathered in the online survey.

3.6.2 Interview

"Interviewing: 'the Art of Asking' or the 'Art of Listening'?"

(O'Leary 2010, p.194)

Interviews for both research phases provided rich in-depth qualitative data. They were flexible enough to explore further tangents with interviewees, and structured enough to be capable of generating information that expanded upon their experiences in the use or deployment of online technologies in education. In addition, rapport and trust was achieved between interviewer and interviewees. Both phase 1 and phase 2 interviews followed the same procedure as recommended by O'Leary (2010): planning (who, where, when, what, how), developing an interview schedule and recording system, conducting a pilot, modifying approach, implementing or conducting the interviews, and managing and thematically analysing the data.

Open-ended, semi-structured interviews were held with teachers in phases 1 and 2 of this research project. The goal was to produce rich and reliable data. All interviews were recorded using a *Sony* digital voice recorder, these were transcribed and analysed in terms of the research questions and cross-referenced. The identification of each individual remains confidential. In order to maintain the integrity of raw data, Savenye and Robinson (2004) advised that the researcher use respondents' words, including quotes liberally. This advice has been deployed in the discussion of findings in chapters 4, 5 and 6.

3.6.2.1 Interviews Phase 1

In phase 1, similar questions were posed to eight interviewees, the five focus group participants and online survey participants in order to triangulate the data and to validate the findings. Interviews set out to qualify, examine and further understand the factors affecting the engagement of teachers in the use of social media in classroom practice and CPD. Further interviews were held with 3 national bodies, namely, DES Inspectorate, the NCTE and the INTO, and the questions centred on the provision and standards of online CPD programmes.

3.6.2.2 Interviews Phase2

In phase 2, similar areas were covered qualitatively in the ten interviews that had been covered quantitatively in the online survey. The goal was to add richness to the quantitative data of stage 1 phase 2. These semi-structured interviews involved open-ended questions. Interviews set out to qualify, examine and further understand the factors affecting the engagement of teachers in the use of social media in classroom practice and CPD. Please refer to Appendix J for the interview questions posed and Appendix K for sample interview transcripts.

3.6.3 Focus Group Phase 1 Only

A focus group is a type of group interview, where the interviewee acts as facilitator, the goal of which, according to O'Leary 2010, p. 196), is "*to draw out a depth of thinking that may not arise from direct questioning*". The focus group was selected to elicit opinions as to the barriers that might exist in the engagement of teachers in online CPD programmes. One advantage of focus groups is that a variety of views can surface. Gray (2006) postulates that group dynamics can encourage new perspectives. The focus group was deployed in phase 1. All of the five focus group participants were teaching in the same school, so there was already camaraderie among them. All seemed very comfortable to communicate their views despite their perceptions of their own technological abilities. A broad agenda of discussion areas was used.

3.7 Data Analysis – Quantitative and Qualitative

Quantitative and qualitative data was analysed for phases 1 and 2 of this study. According to O'Leary (2010, p. 260), "*Whether you are working with qualitative or quantitative data, the main game of any form of analysis is to move from raw data to meaningful understanding*." Statistical tests are commonly used to support an in-depth analysis of quantitative data, whereas qualitative data is coded before analysis or interpretation. Qualitative analysis involved the discovery of themes in the raw data, and by interpreting the implications of these themes in relation to the research questions.

3.7.1 Phase 1 Data Analysis – Quantitative and Qualitative

In Phase 1, qualitative analysis was the focus, using the quantitative data to validate and to extend understanding of qualitative findings. Data for the interviews and focus group were analysed using O'Leary's (2010, p.268-269) six step model: 1) identify biases, note overall impressions; 2) reduce and code into themes; 3) search for patterns and interconnections; 4) map and build themes 5) build and verify theories and 6) draw conclusions. The data was analysed based on key themes emergent and against the research questions.

3.7.2 Phase 2 Data Analysis – Quantitative and Qualitative

As with phase 1, phase 2 qualitative data was analysed in the same way around themes and research questions. Phase 2 quantitative data analysis was conducted by outputting the data gathered within the proprietary HMH survey tool (*Qualtrix*) to *SPSS*, a sophisticated statistical program. *Microsoft Excel* was also used, mainly for the descriptive statistics and for generating pie charts and bar graphs for the full K-12 sample and elementary middle and high school grade levels. The data was analysed at a number of levels including: meta-level, the complete data-set for schools (N=632), the discrete schools' levels, namely, elementary school level, middle school level, high school level, and finally, also at a micro-level (including those schools with open access to social media usage (n=110). Table 3.7 explains the correlations and validity tests carried out on the online survey data in phase 2.

SPSS was used to perform the more complicated correlations (bivariate and multivariate), t-tests and analysis of variance (ANOVA) tests that will be described in greater detail in chapters 5 and 6. Some scales were created from a number of items, e.g. 'student-centred teaching', and Cronbach's α was used to validate consistency of these created scales. Statistical significance, mean and standard deviation information are presented along with the statistics in the analysis section. A number of correlations (the degree of association between two variables) were carried out, for example, to examine if being designated either a disadvantaged school (Dummy Coded No = 0, Yes = 1), a special educational needs school (Dummy Coded No = 0, Yes = 1), a Title School (Dummy Coded No = 0, Yes = 1), or Any Designation (Dummy Coded

No = 0, Yes = 1) was associated with the blocking of social media sites. *Analysis of Variance* (*ANOVA*) tests were run to compare two or more groups of variables, for example to examine if public, private, charter school (n = 627) had an effect on blocking of social media. School type (Public, Private, Charter) was the independent variable and Blocking of Social Media (Range 0-5) was the dependent variable. T-tests were used, for example, to determine if not having social media sites blocked (n = 110) had an impact on the use of social media in the classroom (Social Media Sites Not Blocked: Yes or No) was the independent variables and Social Media Use (Range 0-72) was the dependent variable. Table 3.7 outlines the correlations and validity tests deployed as well as their context of use.

Table 3.7: Phase 2: Correlations, Validity Tests and Contexts of Use.

Test	Description and Context in terms of Current Research Project
Correlation	**Definition:** Pearson's *r* looks at the linear dependence, or relation, between two variables. The statistics are calculated by taking the covariance of the two variables and dividing it by the product of their standard deviations (SD). **Purpose:** To measure the strength of an association between two variables **Context of use:** Correlations are used to assess the magnitude by which two variables are related to one another (range: -1 to +1) The closer *r* gets to either -1 or +1 the stronger the relationship between the variables being correlated. A low value indicates no relationship between the two variables. **Correlations Use in the Context of this Research:** Correlations were used to assess the relation between a number of teacher attributes (e.g., age, gender) and social media use. Correlations were also used to determine how social media use was related to teaching practices.
Analysis of Variance	**Definition:** The test statistic compares the variance between groups to the variance within groups to determine if the means derived from the group vary in a meaningful fashion from means of other groups. **Purpose:** To compare mean differences when you have more than two groups to determine if the means are statistically different from each other. **Context of use**: ANOVA is used for hypothesis testing, to test whether groups differ from one another. (Range: 0 to Positive Integers) **Meaning of Low/ High Value:** An *F* of less than one indicates that the variance between groups is about the same as the variance within groups, indicating no difference. As *F* gets larger, this indicates that there is more variance between groups than within groups, suggesting group differences might be the result of group membership. A values

	table can give you the probability that the *F* value you have can happen by chance given the number of groups and participants in each group. A *p* value of less than .05 is used as an indicator of "statistical significance". **ANOVA Use in the Context of this Research:** In this paper, ANOVA was used to examine if school type (i.e., Public, Private and Charter) and school level (i.e., Elementary, Middle or High schools) had an impact on teacher's access to the internet as well as had an effect on the blocking of social media sites.
t-Test	**Definition:** A *t* test compares two group data to determine if the data from the groups are equivalent. It is similar to ANOVA, but used when there are only two groups. **Purpose:** To compare means to determine if they differ meaningfully from one another. **Context of use**: Anytime you have two groups and want to compare mean responses to see if the differences in groups is meaningful. (Range: 0 to Positive Integer) **Meaning of Low/ High Value:** Like ANOVA, the closer a *t* values gets to one, the smaller the variability between the two groups is relative to the variance within groups. A values table can tell you whether the *t* value derived from the analysis is significant at the $p<$ .05 level. ***t*-Test Use in the Context of this Research:** In this paper, *t*-tests were conducted to examine whether having social media access blocked had an impact on social media use in the classroom, attitudes toward social media, and confidence with social media.
Cronbach's *α*	**Definition:** The Cronbach's *α* statistics is a standardised measure of the intercorrelations between variables that are used to make up a scale in research. The stronger the association between variables, the greater the consistency and the larger the Cronbach's *α*. **Purpose:** Used when you have measures in a study comprised of scale variables and you want a measure to determine if that scale is reliable, i.e., has good internal consistency **Context of use:** Used to provide information regarding the internal consistency of items that are used to construct a scale (Range: .0 to 1.0) **Meaning of Low/ High Value:** Low values indicate the scale does not have strong internal consistency. A value of .7 or higher is usually used as a threshold to indicate that the scale is reliable. **Cronbach's *α* Use in the Context of this Research:** In this study, Cronbach's *α* was used as a measure of reliability for all the scales that were constructed from multiple respondents' responses (e.g., social media use in the classroom was a scale that combined 18 different responses into a single respondent scale).
PCA	**Definition:** Principal Component analysis (PCA) is a data reduction technique that looks at the correlation between a number of variables to determine if a linear

	transformation of those variables can be combined to represent the data in fewer variables. The goal is to explain as much variance in participants' scores with the fewest number of components (i.e., scales) **Purpose:** To reduce the number of items so analysis can be performed with fewer variables, making for a more parsimonious explanations of the data. **Context of use**: Used when you have scale items that are inter-correlated and want to reduce the number of variables in a set. Range: There is no test statistics for this analysis. Eigenvalues are used to identify how many "component" can be derived from the data. A component load of greater than .40 is often used as a threshold to place an original response into a component. The more variance a component can explain, the better. **Meaning of Low/ High Value:** In this analysis, it was hoped to explain as much variance as possible, with the fewest number of components. If much variance could not be explained, this tells us that the original responses are unrelated to one another and cannot be reduced. This makes for more complicated analysis if we must use the original data set and there is a risk of inflating type 1 error. **PCA Use in the Context of this Research:** In this study, PCA was used to determine if the dimensionality of the 19 teaching practices could be better described using fewer components. The result was a combination of four scales from 19 of the items.
Eigen Value	**Definition:** *Eigen* values are derived from data that is constructed in a matrix as the system is examining the dimensionality of multiple items. In PCA we can think of an *Eigen* value as a measure of how closely the scale items, in a given component, are grouped together. The greater the *Eigen* value, the stronger the association among the items in a given component. **Purpose:** To determine if the linear combination of items derived from a PCA are useful and can explain a meaningfully amount of variance **Context of use**: *Eigen* values are used often in multivariate statistics, as they are measure of how variables in a multi-dimensional space are connected to one another. (Range: 0 to Positive Integer) **Meaning of Low/ High Value:** A value of less than one is often interpreted as the items are not closely grouped together and do not explain **Eigen Value Use in the Context of this Research:** This measure is used when interpreting the results of a PCA

3.8 Ethical Approval and Considerations

Ethical approval was sought and approved by the Research Ethics Committee in Dublin City University for phase 1 in July 2007, and in June 2012 for phase 2. The ethics form used was the *Notification Form for Low-Risk Projects and*

Undergraduate Dissertations due to the low risk that this project posed for teachers (personal information deemed not sensitive was collected through interviews, online surveys, or other means). Information included on the ethics form included; plain language description of the proposed research, proposed methodology, potential participants recruitment means, maintenance of anonymity of the participants, risk exposure to researchers or participants. Appendix L comprises the Research Ethics Committee Notification form.

In terms of the ethical process, all participants in phase 1 and phase 2 received information in advance detailing the aims and context of the research being conducted. Each provided their consent. For phase 1, the online survey was implemented with the assistance of the INTO, which provided full access to the 'raw data' resulting from the online survey and allowed for the data to be analysed without any limitations. All interview and focus group participants received a letter in advance detailing the aims and context of the research being conducted. Please refer to Appendix M for a copy of the information sheet. Each signed a consent form, available in Appendix N. All participants gave their consent to have the interviews and focus group recorded and all were allowed to read and edit the transcripts.

In phase 2 HMH facilitated the delivery of online survey by e-mail to 1,800 educators in their *Educator Input Database* and provided full access to the raw data resulting from the online survey again, allowing for the data to be analysed without any limitations. The identification of each individual across both phases one and two remains confidential. A coding system was used to ensure that participants remained anonymous. For phase 1, the codes are as follows: for the interviewees (e.g., T3I is teacher interviewee number 3) for the focus group participants (e.g., T4FG refers to focus group member number 4) and for the online survey participants (e.g., OS56 refers to online survey respondent number 56). For phase 2, online survey participants are unidentifiable apart from those who volunteered their e-mail addresses for follow up interviews. The interviewee code is for example EI7 referring to educator interviewee number seven.

3.9 Rigour, Validity and Reliability

Validity and reliability are important concepts in quantitative research, as highlighted by Creswell (2003). The researcher's experience, their understanding of philosophy and personal beliefs may have a bearing on the method adopted. (Guba and Lincoln 1994) The author of this research is a primary school teacher with experience in educational software and online course development. The researcher is cognisant of the degree of personal interpretation, particularly in qualitative research, and recognises the challenges in proving conclusively that the data gathered sufficiently represents a true reflection of events, thereby affecting its validity. However, as noted by Gray (2006), this may be assisted by the researcher's ability to display a sound understanding of the organisation or context being researched because she or he actually works in it.

The following strategies have been used to ensure rigour throughout both research phases. For phase 1, qualitative data was gathered from the interviews and focus group with the teachers and this was triangulated with the interview of the INTO representative. A follow-up online survey was conducted to validate if the views of the interviewees was representative of a wider body of teachers who had engaged in online CPD. During phase 2, quantitative data was generated through the online survey and the results of this posed further questions on validity and reliability that formed part of the interview questions where qualitative data was gathered. Gathering data from different stakeholders in the study contributes to rigour.

> One of the issues around validity is the conflation between method and interpretation…In new-paradigm inquiry, however, it is not merely method that promises to deliver on some set of local or context-grounded truths, it is also the process of interpretation. (Lincoln and Guba 2003, p.274)

The need for triangulation arises from the ethical requirement to validate the findings. This can be done by using multiple sources of data, according to Yin (2003). A number of different data gathering tools were employed, including interviews, focus group, and online survey with a number of different stakeholders, namely practitioners, course designers and policy-

makers in the online learning CPD space so as to enrich this research project in phase 2. Phase 2 data collection involved online survey and interviews. Participants from elementary, middle and high school took part in the study and comparisons are drawn from all three groups with regard to triangulation. The data from all of these techniques made triangulation possible.

According to Creswell (2012, p. 536), triangulation when applied to research means that: "…*investigators [can] improve their inquiries by collecting and converging (or integrating) different kinds of data bearing on the same phenomenon. The three points to the triangle are the two sources of the data and the phenomenon*." Triangulation was possible in this research study using multiple data collection tools (interviews, focus group, online survey) and using multiple perspectives by including teachers at elementary, middle and high school levels (*Figure 3.3*). For example in phase 1 of the study (based in Ireland), qualitative data gathered from the teacher interviews and focus groups was triangulated with quantitative and qualitative data from the online survey. In phase 2 of the study, quantitative and qualitative data from the online survey and interviews were examined at three different levels of schooling (elementary, middle and high school), as well as at the meta-level of K-12 education, for triangulation purposes.

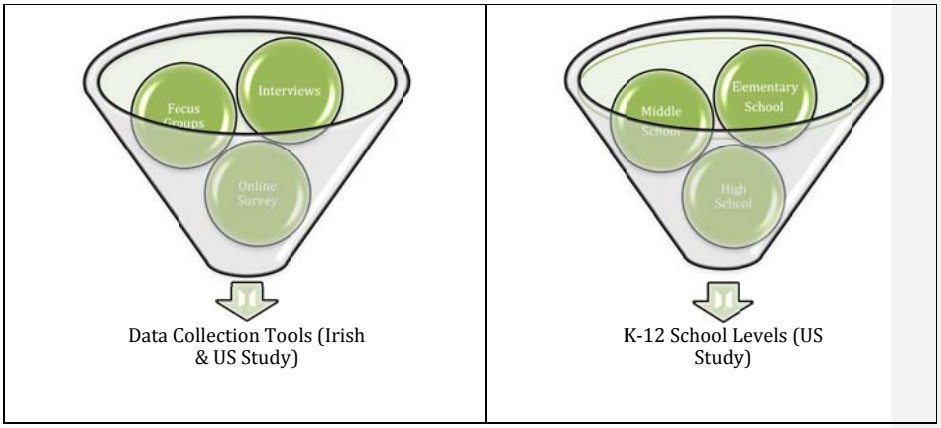


Figure 3.3: Triangulation of Data

Both qualitative and quantitative data were collected, analysed and interpreted. As a result, a more complete understanding of the phenomena of online technologies in the personal lives, professional development and

classroom practice of teachers, than either quantitative or qualitiative could provide on their own. The conclusions drawn were integrated from both sets of data into a cohesive whole as recommended by Leedy and Ormrod (2010). The resultant rich tapestry created through this research is testamont to merits of combining both data sets.

3.10 Limitations of this Study

The first limitation of this study is related to the samples. It could be argued that the sample size for this research may not be fully representative of the teaching population in Ireland or the US. However, the Irish study had to work within the boundaries of those teachers who had already undertaken online CPD courses (offered by INTO in Ireland pre-2008), of which they were 200. 78 of these teachers participated in the study, which is a representative sample of those teachers who had undertaken online CPD courses. It could be further argued that these teachers may be inherently more likely to integrate technology in their professional development activities and their classroom practice than the wider population of Irish teachers, and this is hereby recognised as a potential (but unavoidable) limitation of the study. The US sample came from Houghton Mifflin Harcourt's 'Educator Input Market Intelligence' database of 1,800 K-12 educators, of which 632 participated in the study – a representative sample. Again, it could be argued that the presence of these educators on a commercial database (linked to a educational technology company) automatically implies a cohort of educators more interested in and exposed to new media technologies in their personal as well as professional development and classroom practices. This is hereby also recognised as a potential limitation of the study, but it is expected that the rigorous cross-correlations within the multi-dimensional approach to analysing the data have ameliorated the impact of this.

The second limitation is in relation to how the sample size may have impacted on the phase 2 statistical analysis of K-12 US educators' usage of social media, at the level of schools. Three school levels were examined within this research, namely, elementary, middle and high school levels. When the numbers of teachers at each level was isolated, the cohort of middle school

teachers was the smallest sample of all school levels and therefore a more in-depth study with a larger cohort of middle school teachers may be required to fully validate these findings.

It was the intent of this study to carry out a comparative mixed methods study on social media usage in the personal, professional development and classroom practice of primary and post-primary teachers in Ireland and the United States. However, due to technical difficulties the phase 2 survey did not reach the Irish teachers within the INTO database and the comparative aspect had to be dropped owing to time considerations. This could form a significant area for further research.

3.11 Chapter Summary

The chapter began by examining the philosophical underpinnings of the research. A post-positivist epistemology frames the research. A multiphase mixed methods approach was used to explore teachers' perceptions, attitudes, and experience of the integration of online technologies in their personal lives, professional development and classroom practice. The research took place in two phases - Phase 1: 2007-2008 and Phase 2: 2011-2013. Interviews, a focus group and online surveys were the chosen data collection tools. The data analysis process included the statistical analysis of quantitative data, and thematic coding of qualitative data, at various stages in the research process. The following chapters present the findings of the study; phase 1 findings are presented and analysed in chapter 4 and phase 2 findings are presented and analysed in chapters 5 and 6.

Chapter 4 Findings and Discussions of Phase 1 Research

4.1 Introduction

The first phase of research explored online continuing professional development (CPD) programmes on offer to Irish primary school teachers in 2007. Online teacher CPD was in its infancy in Ireland, the online summer programme having only been available to teachers since the summer of 2006. The initial online CPD summer programmes in Ireland were of twenty hours duration on a variety of subject areas including technology and visual arts. A number of organisations including the Irish National Teachers' Organisation (INTO), the National Centre for Technology in Education (NCTE), the Institute of Child Education and Psychology (ICEP) and Hibernia College delivered these online programmes. There had been no formal review of the online programmes by the providers at that time; neither had any external research been conducted on the programmes that were in operation. This chapter summarises the findings of this first qualitative piece of research on the experiences of online CPD in Ireland.

4.1.1 Online CPD Platform

The online CPD courses were delivered through the *Moodle* platform, an open source Learning Management System (LMS) or a Virtual Learning Environment (VLE) deployed by the INTO. The online courses effectively presented content on a range of subjects in the form of predominantly static resources, such as pdfs, with some interactive elements. There were online discussion forums within each course where teachers were afforded the opportunity to communicate and collaborate with peers. Teachers were deemed to have successfully passed the courses on the basis of time spent online (20 hours per course), completion of mainly multiple-choice type assessments, and active participation (based on number of postings) in the online discussion forums.

4.2 Research Model

As explained in Chapter 3, the research model adopted was that of exploratory mixed methods. The research study set out to answer the following questions:

- What key factors have influenced Irish primary school teachers' engagement in the online learning mode of CPD?
- What barriers (situational, dispositional, institutional, technological) exist in terms of teachers' engagement in online learning?
- Has engaging in online courses influenced teachers' classroom practice? If so, how?
- As a result of engaging in online CPD courses, are teachers more likely to integrate ICTs into their curriculum delivery?
- What are the perceived positive and negative implications (from the perspective of various stakeholders) of using online learning to facilitate CPD?

Therefore, the research questions examined teachers' engagement in online CPD as well as their perceptions of its impact on classroom practice and the resultant integration of information and communications technologies (ICTs) in their teaching and learning practice. Interviews, a focus group and an online survey conducted with 88 teachers and key stakeholders including the INTO, NCTE and the DES Inspectorate revealed a rich context for the online summer programme. The barriers (situational, institutional, dispositional and technological) that existed for teachers engaging in these online programmes will be discussed. Data gathered from the interviews and focus group was validated by the subsequent online survey, which explored similar questions.

4.3 Findings

The findings of this research are presented thematically under the five aforementioned research questions. Both interview and online survey respondents reported attending a variety of 'immersed' online CPD programmes in various subject areas, including; English, maths, history, geography, visual arts, special educational needs, teaching strategies, learning styles, challenging behaviour, ICT, early years education, human rights and web site design.

Table 4.1 provides a summary of statistical information gleaned from the online survey. Most of the teachers surveyed had 16 or more years teaching experience. Seventy percent reported that the online course met their expectations and 80 percent of respondents were positive about their experience. The vast majority reported that they would engage in another online summer course (97.1%). Interestingly, 45.7% of participants said they would integrate ICTs in their classroom practice, and a further 30% would integrate ICTs to some extent, as a result of taking the online CPD programme.

Table 4.1:Phase 1: Summary of Online Survey Data.

Table 4.1a Teaching Experience.

Number of years teaching experience	Response %	Response count
0-4 years	5.7	4
5-15 years	22.9	16
16-30 years	71.4	50

Table 4.1b: School Type.

School type	Response %	Response count
Mainstream school	97.1	68
Special school	2.9	2

Table 4.1c:Gender.

Gender	Response %	Response count
Male	21.4	15
Female	78.6	55

Table 4.1d: Did the Online Summer Course Meet Teachers' Expectations?

Scale	Response %	Response count
yes	70.0	49
to some extent	20.0	14
no	10.0	7

Table 4.1e. Teachers' Ratings of Online Summer Course Content.

Scale	Response %	Response count
excellent	48.6	34
very good	37.1	26
good	7.1	5
average	2.9	2
poor	4.3	3

Table 4.1f. Was the Overall Experience of Taking an Online Summer Course Positive?

Scale	Response %	Response count
yes	80.0	56
to some extent	14.3	10
no	5.7	4

Table 4.1g. Had Engaging in the Online Summer Course Affected Teachers' Classroom Practice?

Scale	Response %	Response count
yes	48.6	34
to some extent	34.3	24
no	17.1	12

Table 4.1h. Were Teachers More Likely to Integrate ICTs in their Curriculum Delivery as a Result of Taking the Online Summer Course?

Scale	Response %	Response count
yes	45.7	32
to some extent	30.0	21
no	24.3	17

Table 4.1i. Would Online Survey Respondents Engage in Further Online Summer Courses?

Scale	Response %	Response count
yes	97.1	68
no	2.9	2

4.3.1 Key Factors Influencing Irish Primary School Teachers' Engagement in Online CPD

A variety of factors influenced teachers' engagement in the online CPD summer programmes: convenience and flexibility, 24/7 access (access 24 hours per day, 7 days per week), shorter time demands than face-to-face programmes, opportunity to up-skill, reduced concern regarding family commitments, lower cost and extra personal vacation (EPV) days. [Rule 58 of the rules for National Schools, entitles teachers to extra personal vacation days on foot of attending approved summer courses. See Appendix O for further information on this entitlement.] Overall, the key factors influencing primary school teachers' engagement were mainly related to personal gain, as opposed to professional development or professional learning.

All interviewees and many online survey respondents used the word "*convenience*" as a reason for engaging in online CPD. Two interviewees noted that they completed their courses while travelling during their summer holiday. "*I loved the fact that I could be in Singapore doing my course in Early Childhood Studies"* (T1I). Many interviewees and online survey respondents were delighted with being able to do the course from the comfort of their own homes rather than having to attend at an education centre. It was perceived that online programmes were less demanding in terms of time. Many had heard from their peers or colleagues who had previously attended an online course that: "*you get through your course in a much shorter period than it would take to do your nine to half two, Monday to Friday"* (T2I). Avoiding the need to travel was also given as a reason for engaging in online programmes: "*I didn't have to travel across the city or travel to any place, have parking issues…I liked that idea"*. (T8I)

EPV days appeared to be a highly motivating factor in teachers' engagement in the online summer programme, for those interviewed in this phase of the study. Some reported that the major factor for their engagement was *"to get the three days off"* (T3I). Interestingly, none of the online survey respondents mentioned the EPV days as a factor in their engagement. Some interviewees described engaging in online courses in order to gain practical ideas

and resources that could be used in the classroom. A greater number of online survey participants highlighted child-minding and associated cost savings as a reason for choosing an online course.

4.3.2 Barriers to Engagement in the Online Mode of CPD

The data gathered here was gleaned mainly from the focus group. For the purposes of this research situational barriers (related to teachers' personal needs), dispositional barriers (teachers' attitudes), institutional barriers (limitations within schools) and technological (the level of technological access or digital skills) were discussed.

Situational Barriers included available time, travel, geographical location and family commitments. Time was seen as a major constraining factor in teachers' lives, irrespective of their circumstances. The idea of not having to attend in person at a centre appealed to many teachers, particularly because of traffic problems. Family commitments and geographical location also seemed to impact teachers' engagement in online CPD, in particular for teachers in remote locations.

Dispositional barriers cited by the focus group included teachers' perceptions of their ability to use technology, confidence with technology, lack of social interaction, fear of failure and self-motivation. With regard to teachers' perceptions of their ability to use technology, it was felt that teachers who had trained some time ago would need to up-skill. The focus group participants expressed their preference for face-to-face courses and felt that 'real' social interaction and learning from peers in a 'real' environment would be lost:

> I think the idea of sitting at home or sitting in your classroom and doing an online course is very disembodying, very isolating…Whereas if you're put onto a course … you know you can meet up with a different group of people and there's a social interaction and all of that. And it makes the whole learning experience much more enjoyable and you get more out of it as well' (T3FG).

There was a feeling that online course participants miss out on meeting other teachers and networking opportunities, and that face-to-face learning provided a more supportive environment. One participant who was

pursuing a blended learning course with the Open University (OU) appreciated meeting with her tutor and peers regularly during the year for social interaction. Blended learning seemed, for her, to be a reasonable compromise. The fear of not knowing how difficult the course might be was identified as another barrier. One participant felt that an individual's preferred learning style determined motivation and preference for online vis-à-vis face-to-face learning. Self-motivation was cited as a barrier to engage in online programmes, it was felt that face-to-face programmes were more engaging.

Institutional barriers mentioned by the participants included; access to online programmes, issues with quality of online content and fewer choices in the range of online programmes (when compared to the range of face-to-face programmes). The inequality in terms of EPV recognition for face-to-face CPD programmes (3-5 EPV days awarded depending on number of face-to-face courses undertaken) and online CPD programmes (a maximum of 3 EPV days awarded regardless of the number of online CPD courses undertaken) was an issue for many participants.

Regarding technological barriers, access to technology was seen as the greatest barrier. The programme structure, ease of use and navigation were stressed as important in counteracting some potential technological barriers. Technology skills and confidence using computers were also highlighted. Technical support and the knowledge that support would be close at hand were regarded as important and seen as a major barrier if absent.

4.3.3 Influence of Online CPD on Classroom Practice

Just under half (48.6 percent) of survey participants reported that the course had positively influenced their classroom practice, 34.3 percent reported that it had impacted their practice to some extent and 17.1 percent stated that it had no impact on their classroom practice. Both teachers interviewed and respondents to the online survey reported that they were able to access more resources, use practical advice and ideas and adopt new methodologies in their classrooms: "*I use the Internet as a classroom resource much more now and with more confidence"*. (OS28)

On the negative side, one respondent felt "*one would learn as much by trawling though search engines on the topics explored"*. (OS8) Others felt that programmes held during the summer holidays have little impact on classroom practice and suggested "*more term-time programmes with the EPV days incentive*". (OS25)

4.3.4 Influence of online CPD on the integration of ICTs in curriculum delivery

Of the teachers who engaged in the online survey 45.7 percent reported that they were more likely to integrate ICTs in their curriculum delivery, 30 percent reported some change in practice, while 24.3 percent reported no change in integrating ICTs in their teaching as a result of engaging in the online course. (Table 2.8) Reasons for increased ICTs integration in curriculum delivery included increased knowledge of resources to use: "*I know where to find what I am looking for now and I have found lots of resources that I never knew existed"*. (OS1) Teachers reported having more confidence in using ICTs for curriculum delivery and improved technology skills. One teacher described how engaging in the online course had not alone impacted her teaching, but her students learning as well.

Some teachers who reported no influence on their teaching explained that they were already using ICTs in their classrooms: *"I use technology in my teaching anyway; doing the course has not changed this"*. (OS35) Others, who had completed programmes that were more theoretical and where ICTs was not the focus or where ICTs resources were not recommended for use in the classroom, saw no increase in their use of ICTs for curriculum delivery. Lack of available equipment in schools, access to the Internet in class and confidence with technology were reasons cited for not using ICTs in classroom practice.

4.3.5 Perceived Positive and Negative Implications of Online CPD

Many of the positive effects cited by teachers echoed the factors that contributed to teachers' engagement in the online mode of CPD. As discussed earlier, the interviewees pointed to convenience, 24/7 access, shorter time demands, flexibility, self-paced learning and EPV days. Up-skilling and gaining practical

ideas for use in the classroom were also cited. Not having to attend a particular centre and the flexibility to juggle family commitments was also welcomed: "*They are great when you have children at home during the holidays and you have the freedom to do the course in your own time".* (OS 11) One respondent claimed that online programmes were "*convenient, and every bit as informative as face-to-face programmes, more so in some ways as there's a chance to re-read something if it's unclear*". (OS 14)

Other positive effects mentioned in relation to the course design, included the collaborative aspect, the ability to access learning while teaching, bridging the geographical divide, sharing resources with colleagues and encouraging teachers to use ICTs in the classroom. With regard to course design, many reported that programmes were well laid out. Ease of use and seamless navigation were other positives mentioned along with appropriate content, coverage of curricular strand units and ideas for integration in other subject areas.

Online programmes provide access to people in remote places "*if location or circumstances do not permit physical attendance"* (OS51) and offer opportunities for learning and professional development that may not be available in Education Centres. Some respondents reported sharing the online course resources with their colleagues. This is something that the INTO representative said teachers were encouraged to do.

The focus group felt that the isolation while doing an online course, difficulties with using the technology, lack of broadband access, lack of skills on the part of teachers, out-dated technology and confidence using technology negatively impacted on uptake of online CPD programmes. They felt strongly that online programmes are not as motivating as face-to-face programmes. Course design and navigational difficulties were also cited as problematic. These included unattractive graphics and layout, non-interactive content (over-use of pdf documents) and lack of diversity in assessment (consisting mainly of multiple-choice questions). Other content issues included monotonous on-screen reading and illegible on-screen content.

The cost of online programmes was also mentioned in the online survey as prohibitive: "*Some of them are costing €99. That is too much"* (OS1) and "*The increase in fees this year seems a bit excessive bearing in mind that many face-to-face courses are half the price being charged for most online courses"*(OS6). The fact that certification of the course required participants to log on for a minimum of 20 hours was a cause of frustration for many:

> We had to log on for a minimum of 20 hours and you would have it done far sooner than that…I'd have to stay online for ages so I'd keep reading and re-reading the stuff and in the end I had to leave it online. I felt that was a little bit unnecessary but I suppose that's something they have to do to cover themselves as well (T1I).

4.3.6 Collaboration Feature Within Online CPD

A collaborative aspect was present in the majority of programmes, with just 4 percent of participants reporting no collaborative aspect to their course. Teachers' experience differed greatly in terms of their engagement in and experience of this aspect of the course. Positive comments included new insights received from participants in different parts of the country, the opportunity to interact with others and share ideas, opinions and approaches. One participant reported feeling apprehensive about this element, as they had no prior online collaboration experience. Another thought that it was "*strange to be communicating with 'unseen people'"* (OS27).

Some participants in the current study missed the social interaction experienced in face-to-face programmes. Others did not find the collaborative aspect particularly useful or challenging: "*submit one comment and you met the criteria"*. (OS13) Some felt that the collaborative aspect was limited compared to the potential of other Internet discussion forums and message boards: "*very poor - all that was required was a short comment"*. (OS3) The lack of interactivity and peer-to-peer collaboration was highlighted by many participants as "*not very collaborative! People posted a quick response and didn't tend to respond to others"*. (OS5) The opportunity for peer-to-peer learning was perceived to be lost:

> It was very simplistic in many ways, it didn't really explore peer learning. You could have quite easily gone through the course and just posted very basic comments and finish. It didn't require you to interact

> with other students at all. It's one area that's just not as good as the centres where you would have interacted throughout break-time and heard other people's opinions. The way the course was set up there wasn't opportunity for that. The tasks did not require you to interact…you know just multiple-choice questions (T7I).

The fact that people were required to post a message was also problematic: "[having] *to send a required amount of messages…this was just formulaic rather than interactive"*(OS9). Another response indicated an issue in understanding how to critically engage within an online forum –"*Because we HAD to post, the posts were not necessarily interactive, i.e. people posted their answer to a set question, so it was like a long list of individual monologues, a lot of agreement, not a lot of controversy, which is what gets people interacting"* (OS6).

Anonymity of participants in a collaborative environment emerged as another theme where it was felt that anonymity would have rendered more interactive discussion: "*I don't agree with having to use real names for postings…there would possibly have been more discussion then"*. (OS 14) Posting messages for the sake of course assessment and qualification for the EPV days was also highlighted: "*I understand why it was used but it was too open to abuse to make it useful. A lot of the time I had to trawl through repeated irrelevant comments to make my own irrelevant comment"* (OS17). While many teachers appreciated the collaborative aspect provided in the online environment, many provided critical feedback as to how this area could be improved for future programmes.

4.4 Discussion of Phase 1 Research

The overall response from the majority of teachers who engaged in online CPD indicated that their expectations were met. However, the impact of the course on classroom practice within their subject discipline varied amongst participants, as did their use of ICTs in their teaching. The following section discusses key concerns and recommendations in terms of policy formation, skills and structural issues and online course design issues.

4.4.1 Policy Formulation

The opportunity exists for the DES to standardise its approach with regard to the award of EPV-days for face-to-face and online CPD programmes. The need for parity within the EPV-scheme was a concern raised by teachers participating in this research. If the current inequality in EPV recognition for online CPD programmes is not redressed, the online programmes may become less valued by teachers and this may result in reduced teacher engagement in online CPD programmes in the future.

Given the number of providers in the online summer programme and the autonomy of teachers to choose among them, the question of quality control becomes crucial. Course providers maintain different standards in the design of courses, which impacts the users' experience. For example, one participant found one course difficult and two others "*not remotely difficult"*. (OS 23) This highlights some issues with regard to standardisation and quality of course experience and difficulty level. An opportunity exists for stakeholders (DES, INTO, NCTE) to standardise the overall quality control framework, including pedagogical aspects such as the degree of learning challenge and interactivity within online CPD programmes.

4.4.2 Teachers' Skills and Structural Issues for Online Course Providers

Barriers to online CPD for primary teachers identified in this study included the lack of access to technology, inadequate infrastructure and training. These barriers to engagement have persisted despite being highlighted by others, such as McGarr and O'Brien (2007), who identified lack of access to technology (55%), inadequate hardware (39%) and poor technical support (13%) as key barriers to integration of ICT in education. Course providers need to consider issues around poor access to technology and inadequate infrastructure noted in this study as a matter of urgency. Furthermore, teachers arrive with varying levels of the experience and skills necessary to fully engage in online learning. As a minimum, course providers ought to be aware of the differing skills-levels of their target audience, and provide appropriate support and training for those engaging in online CPD programmes.

According to Thurston *et al*. (2008), teacher engagement in CPD improves classroom practice and has a positive impact on student achievement. Some teachers in this study mentioned elapsed time between attending online CPD programmes and the opportunity to apply this learning. The impact of learning gained may be lost if application of learning cannot happen until the teacher returns to school. Sugrue (2002) cautioned that this lack of support at school/ classroom level might result in learning that is not sustained. Therefore, course providers may need to consider extending the availability of online summer programmes to term time in order to improve flexibility and transformation of learning into classroom practice.

4.4.3 Online Course Design Issues for Courser Providers

The collaborative aspect of online programmes is an area where improvements can be made by course developers. The constructivist philosophy of creating knowledge through collaboration strongly underpins this aspect of online programmes. A number of recommendations are made here for course providers.

Peer-to-peer learning should form an integral part of the online CPD programmes. Daly *et al*. (2007) found that peer-to-peer learning encourages participants to talk about their concerns and creates a "*sense of shared responsibility for learning in the forum"* (p.458). One of the concerns relayed by participants in this research was the lack of meaningful engagement amongst teachers within the discussion forum in the online CPD programmes – the emphasis was on reaching a quota of postings rather than on intellectual critique, inquiry or review of practice. The quality of online learning can be increased by fostering meaningful online dialogue, within online communities of practice. (Sugrue, 2002 p. 330) Recognising that "*learning communities are not a panacea for teachers' learning"*, Sugrue (ibid) comments that these communities can provide on-going support for practising teachers. Meaningful exchanges (within discussion forums) among course participants where teachers can learn from each other as well as contribute to others' learning based on their experience can be facilitated. However, as noted by Selwyn (2000), *"it is essential that they [online discussion groups] be as inclusive as possible,*

proving attractive to all teachers and not stagnating as closed communities of enthusiastic but inward looking cliques".

Anonymity was suggested as a way to increase audience participation in the online forums. This echoes Daly *et al.'s* (2007) findings indicating that the 'anonymising and democratising' effects of CMC [computer mediated communication] encourages more enthusiastic online participation. Course providers do need to gather personal information, including the names of participants and the degree to which they have engaged within the online course, in order to examine compliance with DES course attendance and assessment requirements. However, this should not preclude course providers from facilitating participants' anonymity whilst engaging in online forums.

Course providers ought to re-examine the aesthetic design of online CPD programmes. The look and feel of particular online programmes was criticised in terms of unattractive graphics and layout, and described by one as "*looking at a dull web site, which you would flick off very quickly and go on to the next one"* (T6I). Course providers should be aware that their audience is becoming more discerning and increasingly exposed to other technological experiences. Flash-based graphics and animations and videos with teachers demonstrating and communicating best practice could be included.

The need to re-examine the pedagogical design of online CPD programmes can also be considered. Donnelly and O'Rourke (2007, p. 34) comment that quantity often takes precedence over quality of materials within online learning environments. This can result in students continuously 'reading up' (from the screen) as well as 'reading down' (when they choose to print the material), ultimately encouraging shallow rather than 'deep learning'. The content and assessment aspects of the online programmes were criticised by some teachers within this study for their lack of interactivity. The focus should be on the effective utilisation of technology to create a rich and meaningful learning experience for those engaging in online CPD. The use of PDFs on screen can be reduced and more interactive ways of delivering the content explored. Multiple-choice questioning (used in many of the online courses) as a

means of assessment does not in itself promote higher-order learning, and indeed is indicative of a narrow conceptual understanding of the purpose of assessment. A broader conceptual understanding and framework of assessment could be developed to include the concept of assessment-for-learning (as espoused by Black and Wiliam, 1998). Reflective diaries, portfolio and problem-based activities could be integrated as a means of assessing and promoting learning.

4.5 Conclusions

This exploratory mixed methods study reflects a snapshot of developments in the area of online CPD for primary school teachers in Ireland. The findings confirm that despite high satisfaction levels amongst users of online CPD, much improvement is required particularly in terms of collaborative and interactive elements of online CPD course design, in policy formation for the standardisation and recognition of online CPD programmes and in the degree of pedagogical challenge within online CPD programmes. The research suggests that online CPD positively impact on teachers' use of ICTs, however, the potential for using online CPD as a vehicle for promoting the integration of technology in education is not being fully exploited due to the aforementioned issues.

Despite the passage of time since the phase one research was initially conducted, the findings are relevant both from an historical and axiological perspective. As no other study was conducted on these online programs when they were first launched, this research provides an historical insight into the value, relevance and teething problems associated with initial online CPD courses for Irish teachers. Furthermore the research is of value from an axiological perspective in terms of the "*goods*" that emerged in order to influence research questions posed in phase 2. Similar themes and trends also emerged, for example:

1. Similar barriers to technology integration were identified in phase one and phase two also despite the time difference between both studies.
2. The transference of skills in phase one between teachers having attended the summer programs and their subsequent use of technology in their

classroom and between the three domains of teacher use in phase 2 (personal, professional development and classroom practice)

3. Recommendations from both phases one and two stress the need for CPD to support teachers in integrating online technologies and social media in their classrooms.

It is evident from the findings that further research is needed in this area particularly as online CPD is still in its infancy in primary education in Ireland. Sugrue (2002, p. 327) argued that "*without support and feedback for teachers at the level of the school when new methods are being 'tried', the pedagogical status quo is likely to prevail*". In particular, there is a real need to examine ways in which online CPD can help support and extend the professional learning of teachers as they practice. This will be central to promoting the meaningful integration of technology in primary education in Ireland and elsewhere. Finally, it was evident that social media and Web 2.0 enabled technologies were utilised to a very limited extent in online CPD in Ireland at the time of this study, so the second phase of research moved to the United States, to examine if teachers' personal use of online technologies or their use of online technologies in professional development impacted on the integration of social media in the classroom.

Chapter 5 Research Phase 2 Findings

5.1 Introduction and Background

Phase 2 of the research sought to understand the penetration and role of online technologies, particularly Web 2.0 and social media technologies, in the personal lives of K-12 teachers, for professional development and/ or within classroom practice in the US. It also sought to understand educator outlook on online technologies integration within K-12 classroom environments. As outlined in chapter 3, this phase of the study deployed a mixed methods methodology, utilising an online survey and follow up in-depth interviews during the data collection process. This chapter presents an overview of the profile of participants and their schools, levels of access to hardware and online technologies, and the extent and types of online technologies and/ or activities integrated within K-12 teachers' personal lives, professional development and classroom practice. Finally, it concludes by presenting a brief discussion of additional information gleaned from those interviewed in the latter stages of phase 2 of the study. [It is important to note here that correlations in respect of teachers' usage of online technologies/ activities are examined in chapter 6.]

5.2 Presentation of Findings from Phase 2

The discussion begins by summarising the profile of survey participants in phase 2 of this study. It continues with an outline of the degree of access to hardware and online technologies in US schools and classrooms engaged in this study, and of participants' usage of online technologies/ activities in their personal lives, for professional development and classroom practice. It progresses with an examination of participants' teaching and learning approaches, participants' beliefs on the potential of social media in education and their confidence in the

use of online technologies, in addition to barriers to the use of online technologies/ activities in K-12 education.

5.2.1 Participant Profile

A very high response rate of 632 respondents (86% female, 14% male) was received, interestingly; this gender breakdown equals the US percentage gender breakdown of teachers in K-12 as outlined by Feistritzer (2011). A majority of those who responded were female, (86%) while 14% were male, as illustrated in *Figure 5.1* below.

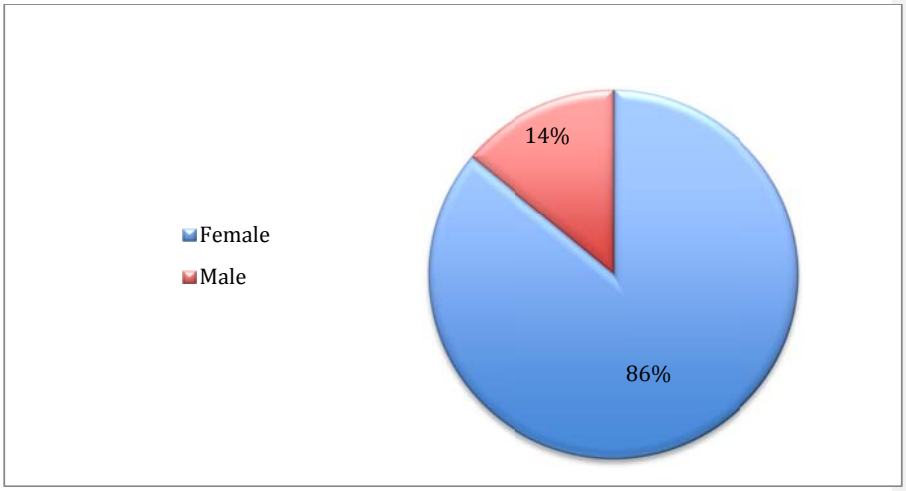


Figure 5.1: Phase 2 Online Survey Respondents by Gender

Figure 5.2 illustrates participants' years of teaching experience: 2% reported 4-10 years, 24% reported 4-10 years, 41% reported 11-20 years, 22% reported 21-30 years, 10% reported 31-40 years, and 1% reported 'other'.

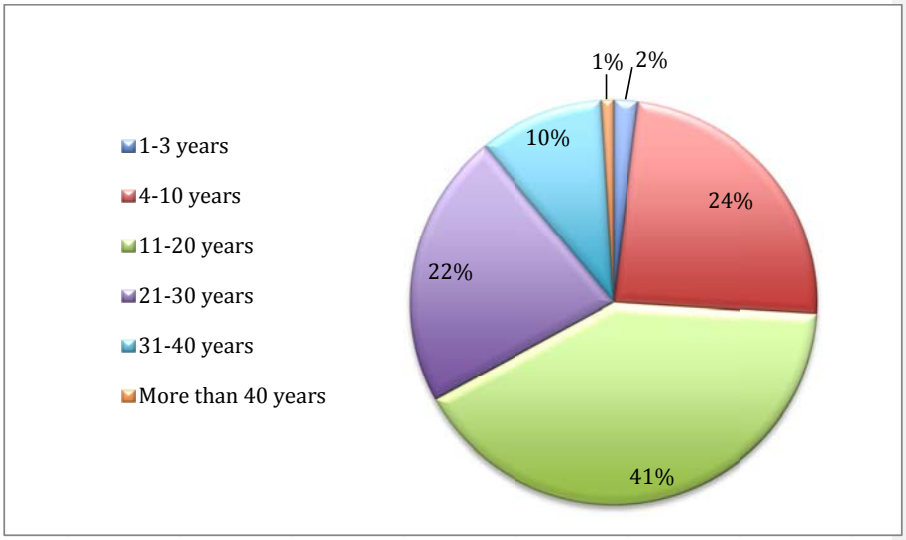


Figure 5.2: Phase 2 Online Survey Respondents' Years of Teaching Experience

In terms of age (*Figure 5.3*), 1% were under 25 years, 17% were between 25 and 35 years, 28% were between 35 and 45 years, 26% were between 45 and 54 years, 26% were between 55 and 64 years, 1% reported being 65 years or older, and 1% preferred not to answer. This would seem to indicate that age and years of teaching experience are closely aligned, since younger teachers in general reported fewer years of teaching experience.

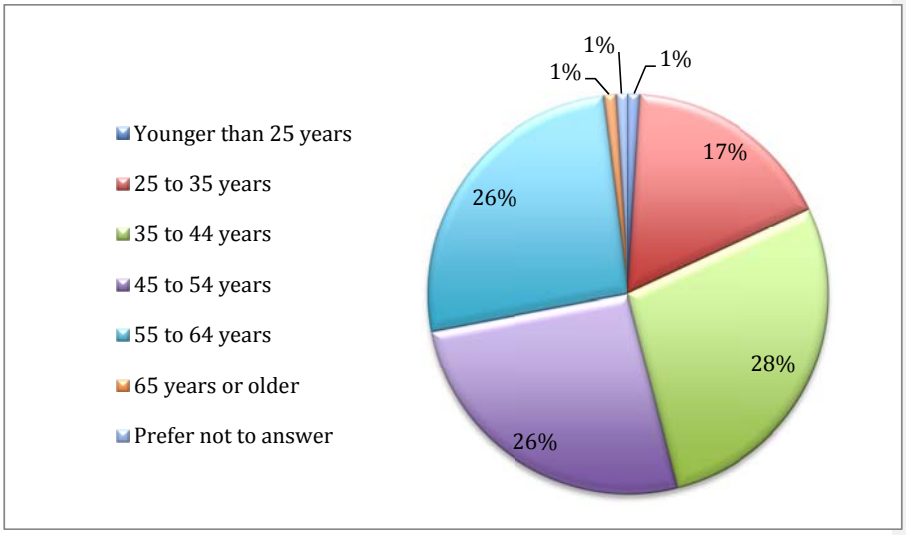


Figure 5.3: Phase 2 Online Survey Respondents by Age

Furthermore, 45% of respondents were from Elementary school, 15% from Middle school and 34% from High School, 6% from 'other' as illustrated in *Figure 5.4*. Respondents who selected 'other' listed 7-12th grades; all grades meaning K-12 combined Elementary and Middle, or Early Childhood Center. Of the 632 online survey participants, the top 5 states represented were; California (10%), Illinois (7%), Pennsylvania (6%), Ohio (5%), and North Carolina (5%), in terms of geographical representation.

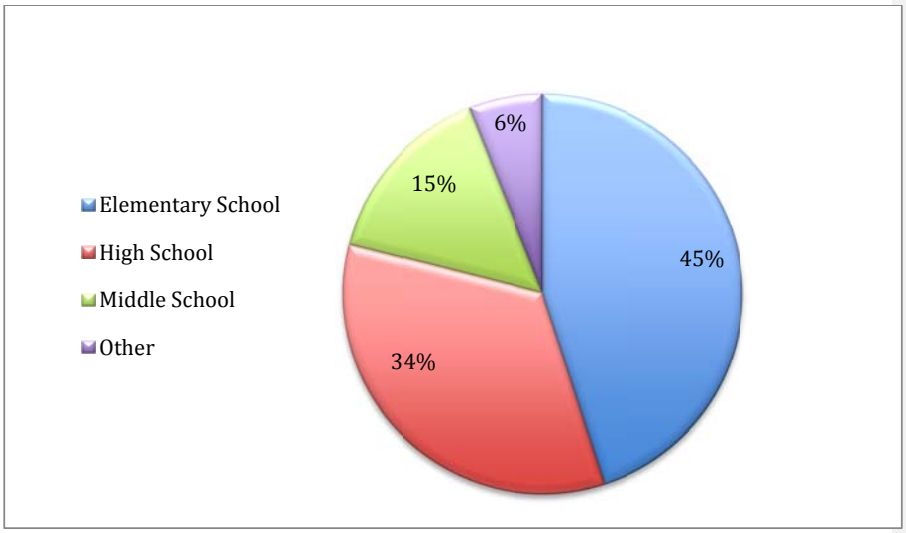


Figure 5.4: Phase 2 Online Survey Respondents by School Level

In terms of school type (*Figure 5.5)*; 94% worked in public (non-charter) schools, 4% in public state run schools, 1% in private schools, and 1% in 'other'. Other educational establishments included; Virtual Online School, Small Learning Community, and Public Charter School.

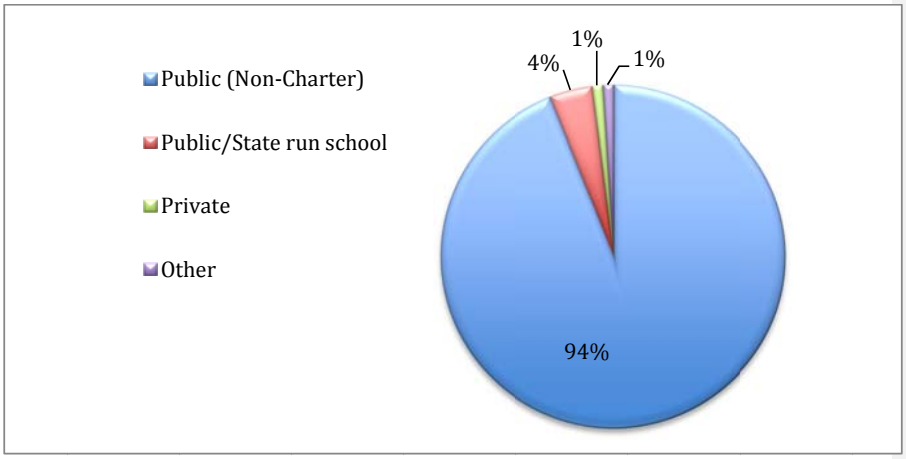


Figure 5.5: Phase 2 Online Survey Respondents by School Type

As illustrated in Figure 5.6 below, the majority of participants worked in mainstream schools (67%), 13% in Special Educational Needs schools or Special Education Centres, 18% in Disadvantaged schools or academies, and 11% reported 'other'. Other designations of schools here included; Alternative High School, Race to the Top, *Title 1* School.

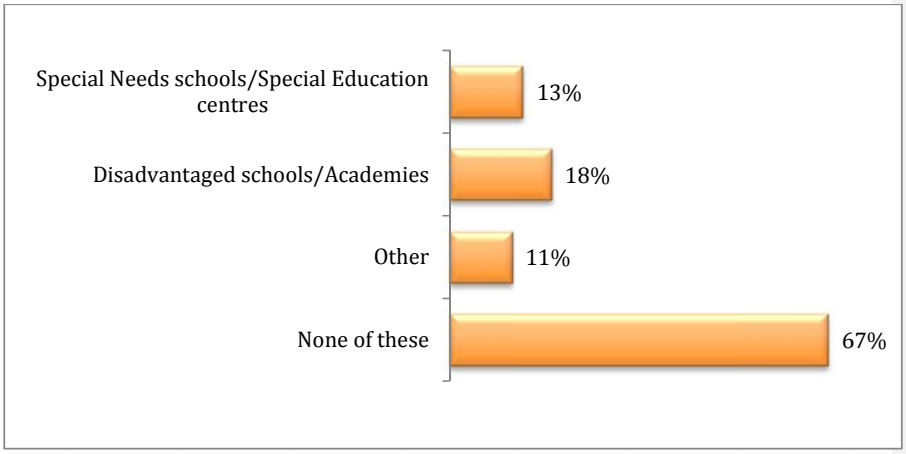


Figure 5.6: Phase 2 Online Survey Respondents by School Designation

Figure 5.7 below outlines the percentages of educators by grade level.

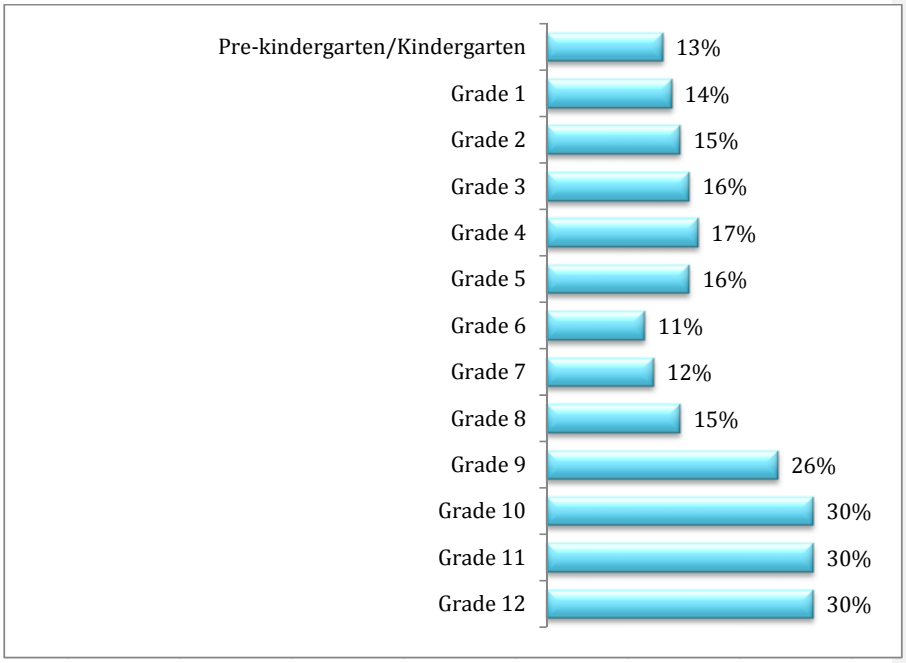


Figure 5.7: Phase 2 Online Survey Respondents by Grade Level

Regarding school area population (*Figure 5.8*), 7% were working in a large city (population in excess of 1,000,000), 25% in a city (population 100,000 to 999,999), 36% in a town (population 15,000 to 99,000), 21% in a small town (population fewer than 14,900) and 11% worked in a village or rural area (population fewer than 3,000).

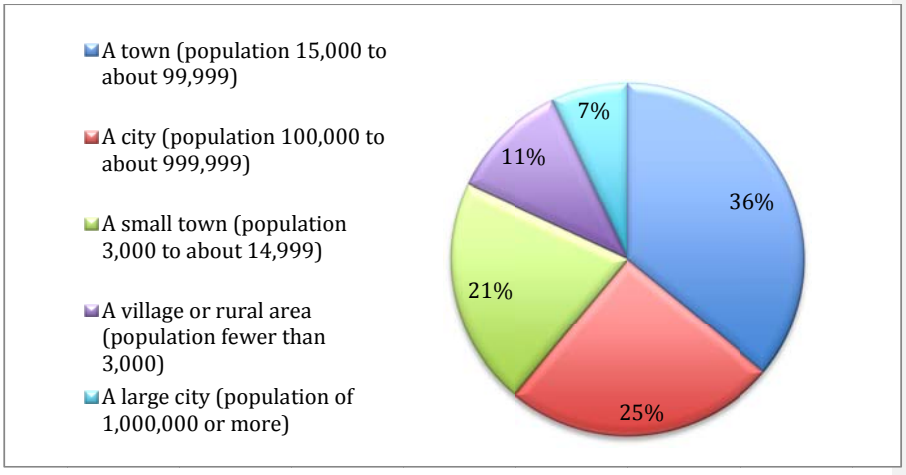


Figure 5.8: Phase 2 Online Survey Respondents by School Population

The vast majority of respondents were Classroom Teachers (83%), as illustrated in *Figure 5.9* below. Other types of positions included; Curriculum Specialists (3%), Department Directors (3%), Head Teachers (3%), Curriculum Coaches (2%), Principals and Assistant Principals (1%), Administrators (1%), other (4%).

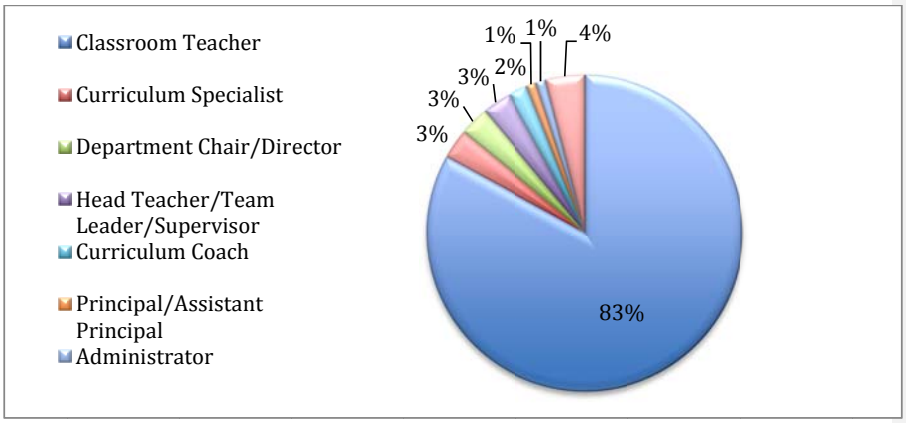


Figure 5.9: Phase 2 Online Survey Respondents by Job Title

The 'other' job titles for educators included; ELL Specialist, Reading Specialist, *Title 1* Math Teacher, Intervention Specialist, teachers of Psychology, Creative Writing, Gifted Education, and Health, Information Technology. No significant difference was found in terms of job description in the elementary, middle and high school distributions.

Grades taught ranged from Pre Kindergarten to 12th grade. Subjects taught (*Figure 5.10)* included English language arts (54%), math (52%), reading (51%), social studies (48%), science (46%), literature (33%), foreign languages (16%), English as a second language (11%), arts education (10%), and 'other' (6%). A higher percentage of teachers of Literature (33%), English language arts (56%), reading (55%), math (55%), science (49%), and social studies (49%), teachers was found at elementary level as opposed to middle or high school, all other subjects were fairly equivalent.

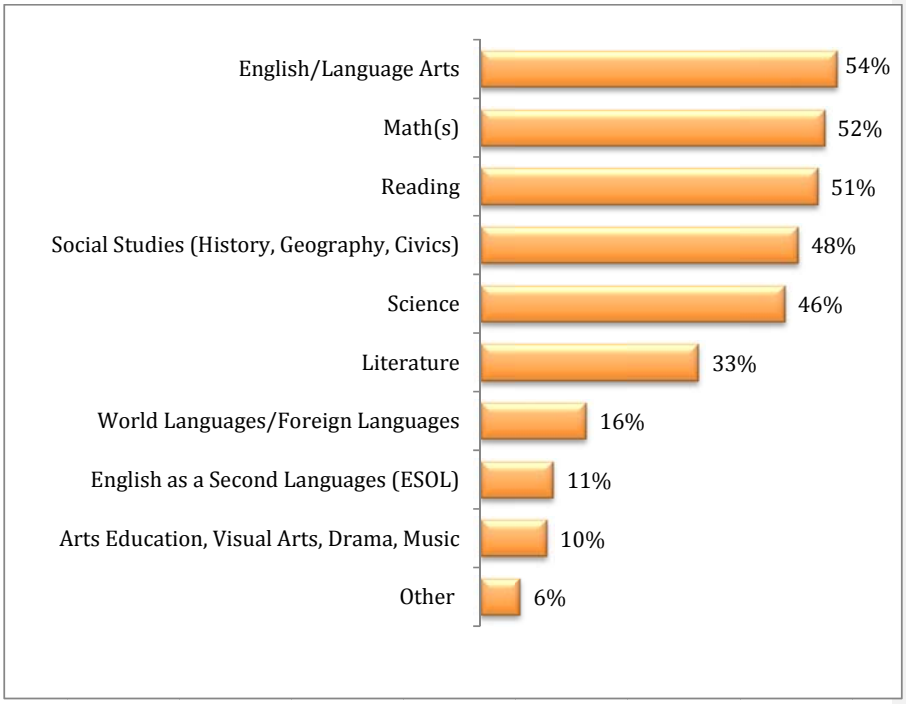


Figure 5.10: Phase 2 Online Survey Respondents by Subject Area Taught

5.2.2 Access to Hardware and Online Technologies in US Schools and Classrooms

The majority of educators surveyed reported having regular access to the Internet via computers (78%) and Mac/ PC laptops (54%) for teaching purposes, as illustrated in *Figure 5.11*.

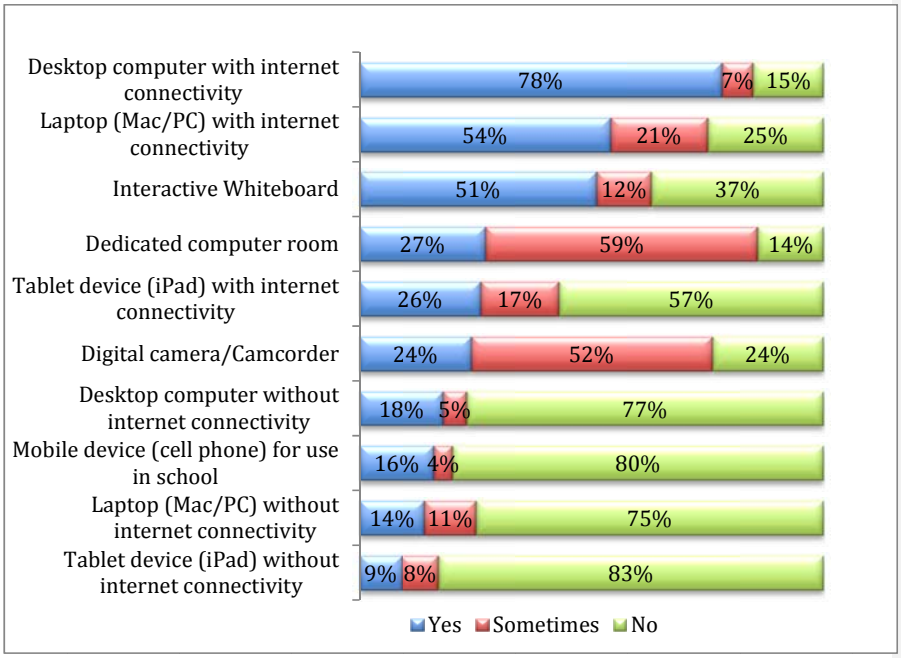


Figure 5.11: Phase 2 Online Survey Respondents' Access to Technology for Teaching Purposes

Just over half (51%) of participants in this study have access to Interactive Whiteboards and laptops with Internet access. One quarter (26%) have regular access to tablet devices (iPad) with Internet connectivity. Three-fifths are provided with laptops by their school, but only one-fifth reported that students are provided with this device.

For 33 percent of participants and for most students (78%), schools do not provide either of laptop or tablet devices, as illustrated in *Figure 5.12*. No significant difference was found in terms of access to technology hardware at K-12 overall versus elementary, middle and high school distributions. High school students were more likely to be provided with laptop and tablet devices (22% in high school as opposed to 14% in both elementary and middle school). Fourteen percent of high school students as opposed to 9% in elementary and 8% in middle school were provided with tablets

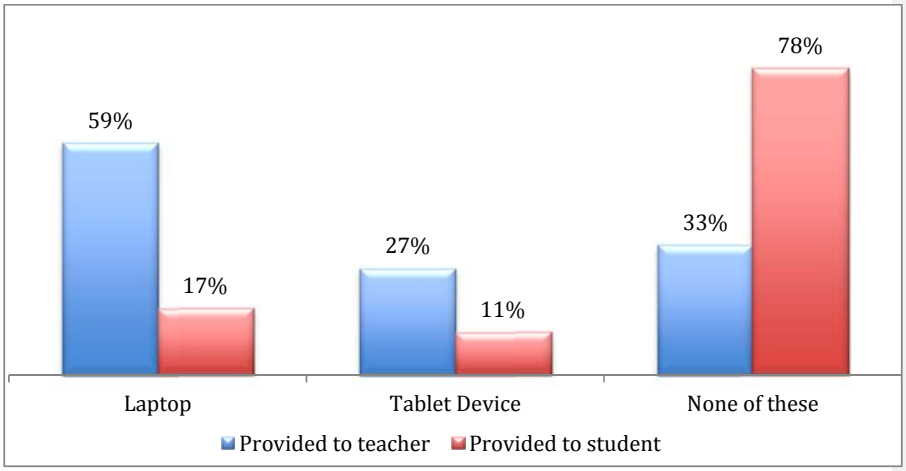


Figure 5.12: Phase 2 Online Survey - School Provided Technology for Classroom Use

About one-third of the respondents said that their students are allowed to use their personally owned devices in the classroom; tablet devices (31%), laptops (27%) and mobile/ smart phones (25%), as illustrated in *Figure 5.13*. However, almost three-fifths (59%) said that students are not allowed to use any personally owned devices in the classroom. In terms of school level differences, almost twice as many high school students are allowed to use their personally owned devices for school use than elementary or middle school students.

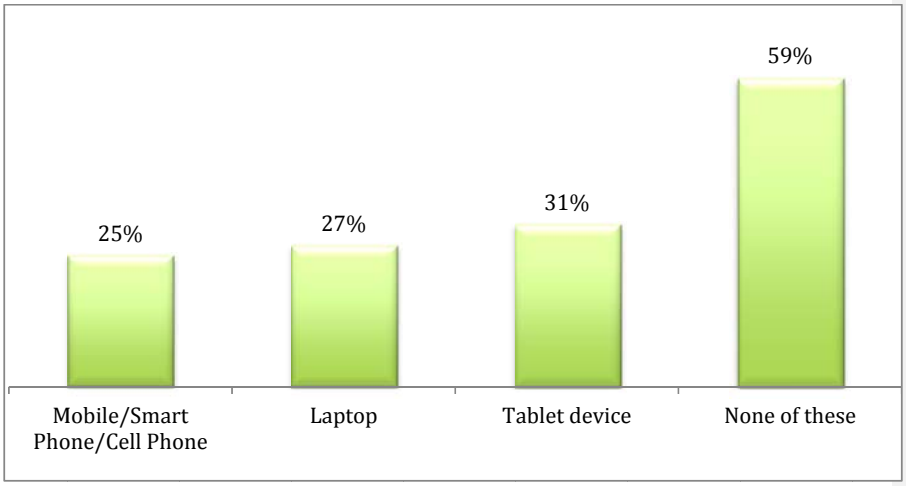


Figure 5.13: Phase 2 Online Survey - Student Owned Devices for Instructional Use

Seventy-nine percent of teachers 'strongly agreed' or 'agreed' that social media is restricted in their schools, that there is insufficient Internet bandwidth (44%), insufficient numbers of computers/ laptops/ tablet devices (65%) and insufficient technical support for teachers (60%).

As illustrated in *Figure 5.14*, the majority of teachers are blocked from using specific social media in their classrooms; such as social networking sites, e.g. *Facebook* (75%), blogging sites, e.g. *Twitter*, (60%), instant messaging, e.g. *MSN* (58%), and Web-based communication, e.g. *Skype*, (42%).

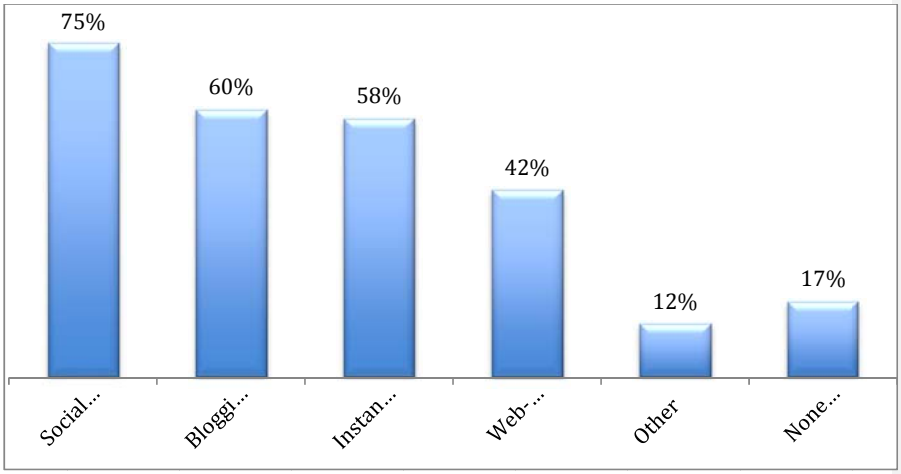


Figure 5.14: Phase 2 Online Survey - Social Media Blocked in the Classroom

'Other' answers included; *YouTube*, *Edmodo*, e-mail sites – *Yahoo* and *Google*, gaming sites, *Netflix*, etc. EI3 reported: that "*Skype* and blogging sites are allowed on an individual request, as needed basis", 17% have no restrictions. No significant differences in social media blockages were found at the different school levels (i.e. elementary, middle and high school).

5.2.3 Participants' Personal Engagement with Online Technologies/ Activities

Educators were asked to comment on their engagement with online technologies/ activities in their personal lives in the past year. E-mail is, by far, the most frequent online activity in respondents' personal lives (92%). Over half use social networking sites such as *Facebook* or *LinkedIn* daily (53%).

However, 70% stated that they had neither followed nor contributed to micro blogs such as *Twitter*, nor had they interacted with a virtual learning management system such as *Moodle* or *Blackboard* in the past year. Most interesting are the online activities that teachers have not used in their personal lives in the past year including: instant messaging (39%), micro blogs, such as *Twitter* (70%), creation of online documents (52%), collaborative creation of online documents (62%), discussion forums (49%), interaction with online communities of practice (69%), image sharing (53%), video sharing (56%), web site creation (74%), accessing videos online, (56%), creation of online presentations (74%), wikis creation (86%), and access virtual social worlds (94%). *Figure 5.18* provides further information on the frequency of K-12 educators' use of online and social media technologies in their personal lives during the past year.

5.2.4 Participants' Use of Online Technologies/ Activities for Professional Development

The vast majority of educators did not engage with online technologies/ activities for professional development, with the exception of e-mail, which was used daily by 42%. Over half (60%) reported that they had never interacted with a virtual learning management system, used social networking websites such as *Facebook* (80%), interacted with an online community of practice (68%), partook in a discussion forum (56%), created online documents using *Google Docs* (59%), collaboratively created online documents (61%), instant messaging (83%), create wikis (83%), blog (77%), follow or contribute to micro blogging (85%), share images (85%), create websites (75%), video conference (77%), share videos on line (74%), create online presentations (68%), interact in an online classroom (75%), or participate in a virtual world (94%). *Figure 5.19* provides further information on the frequency of K-12 educators' use of online and social media technologies in their professional development during the past year.

Nearly three quarters had spent at least one day participating in professional development over the past two years, 22% had spent in excess of six days, 19% spent between four and six days, 31% spent one to three days and

28% reported spending less than a day in the previous two years (*Figure 5.15*). No significant difference was found between elementary, middle and high school educators and the amount of time spent in professional development activities in the past 2 years.

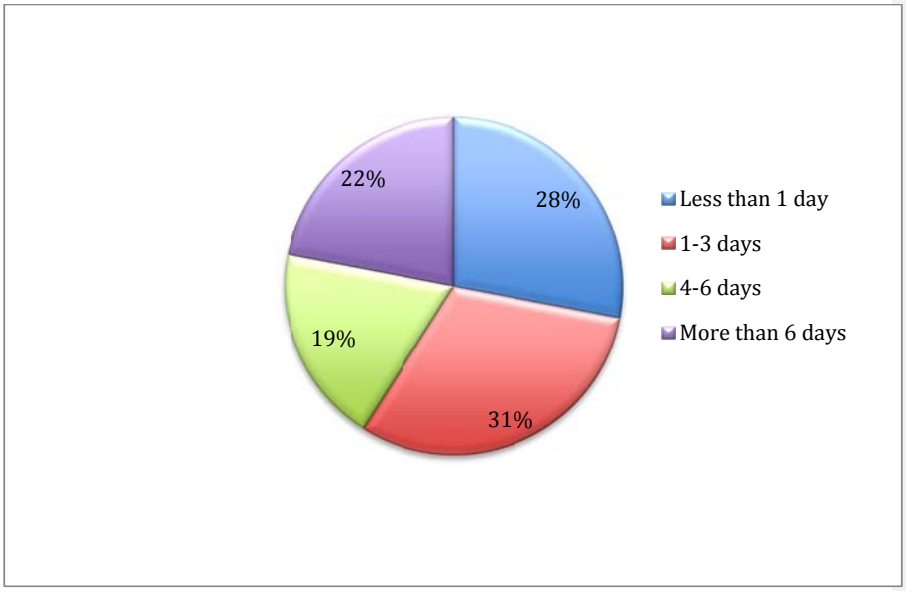


Figure 5.15: Phase 2 Online Survey Respondents' Time Spent in Professional Development Opportunities Over The Past 2 Years

Figure 5.16 shows the kind of professional development undertaken by K-12 educators. Of those who participated in professional development, 66% reported focusing on how to use specific classroom technologies, 37% focused on basic computer applications, 23% on how to participate in online communities for teachers, 22% on web publishing, 20% on web video conferencing, 18% on how to create a virtual course (using systems such as *Moodle* or *Blackboard*), 21st Century learners, 17% on technology integration in classroom, 7% on pedagogical use of ICT in teaching and learning, 4% on eTutoring, other professional development related to classroom technology. Some 13% spent personal time learning about ICTs. Others listed how to use iPads, iPods, and apps in the classroom and using digital media in the classroom as other professional development undertaken. Again, no significant difference was found between elementary, middle and high school choice of courses.

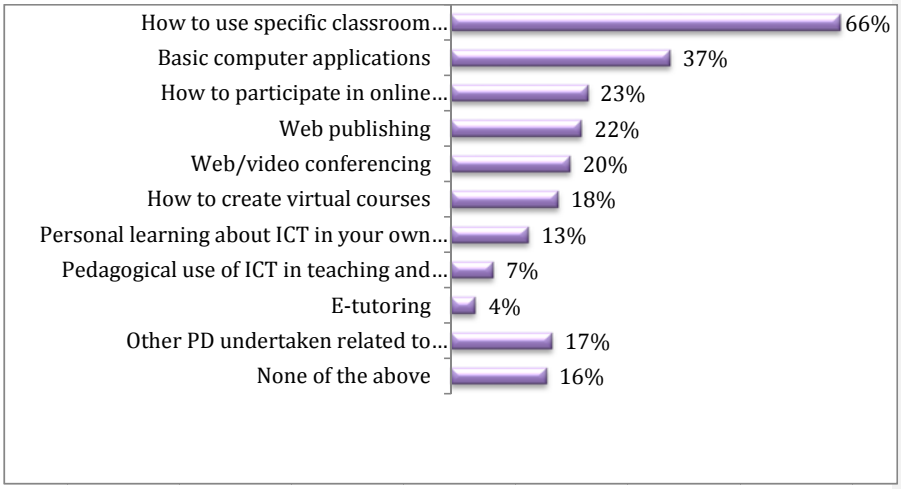


Figure 5.16: Phase 2 Online Survey Respondents' Participation in Professional Development in the Past Two Years

5.2.5 Participants' Use of Online Technologies/ Activities in Classroom Practice

Regarding frequency of engagement with online technologies/ activities in classroom practice in the past year, besides e-mail, online activities are limited in the classroom. E-mail is, by far, the most frequently used online activity in respondents' classroom practice (79% reported using e-mail daily). The following online activities were reported as never being used in the past year; interaction with a virtual learning management system such as *Moodle* or *Blackboard* in the past year (64%), instant messaging (85%), micro blogs, such as *Twitter* (90%), create of online documents (52%), collaboratively create online documents (60%), discussion forums (71%), interact with an online community of practice (77%), share images (77%), share videos (60%), create a web site (66%), online video conferencing, (83%), create an online presentation (61%), interact in an online classroom (88%), create wikis (82%), and access a virtual social world (95%). Therefore, the percentages of educators who access the above online activities varies considerably; with once daily ranging from 1-79%; on a weekly basis ranging from 1-17%, on a monthly basis from 1-14%, and on a few times per year basis ranging from 1-17%. *Figure 5.20* provides further information on the frequency of K-12 educators' use of online and social media technologies in their classroom practice during the past year.

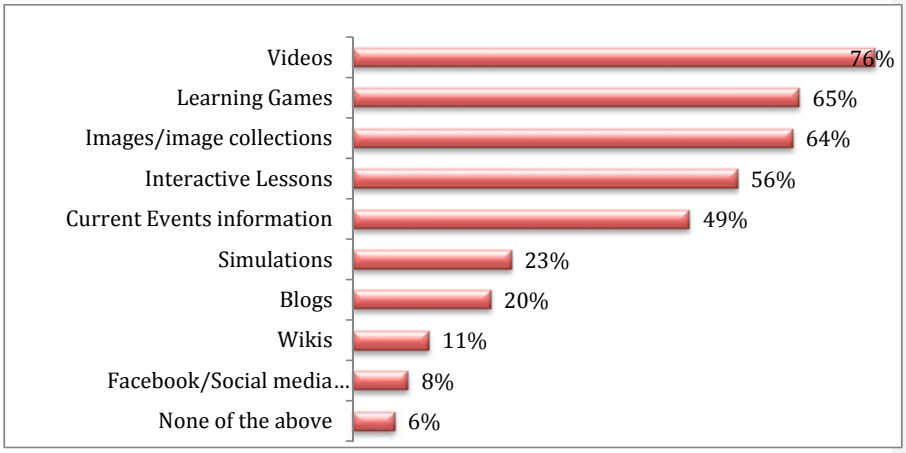


Figure 5.17: Phase 2 Online Survey Respondent's Daily/ Weekly Use of Internet Resources in the Classroom

As illustrated in *Figure 5.17*, over three quarters of teachers say they use videos as Internet resources in the classroom on a daily/weekly basis. Less than a quarter use simulations, blogs, wikis, or social media communities in the classroom on a daily/weekly basis. Video was by far the most used Internet resource in classrooms on a daily/ weekly basis (76%), followed by learning games (65%) image or image collections (64%), interactive lessons (56%), current events information (49%), simulations (23%), blogs (20%), wikis (11%), and *Facebook* or social media communities (8%). Six percent replied 'none of these'. Learning games were significantly more popular among educators at elementary (69%) and middle school (70%) than at high school (43%).

5.2.6 Participants' Teaching and Learning Style

Online survey participants were asked to comment and rate statements in regard to their teaching style. A six point *Likert* scale was used to gauge responses to these statements ranging from 'strongly agree' (1) to 'strongly disagree' (6). Most educators teach to the whole class (76%), 68% provide time in every class to support individualised instruction, 57% promote a diversity of modes of assessment including summative assessment and continuous assessment while 56% collaborate with colleagues in the creation of learning resources for their discipline area. Lower percentages of respondents said that they invite other teachers to observe and critically review their teaching and learning (T&L)

approaches (28%), request student feedback on T&L and assessment strategies (27%), actively use resources that have been created by students (19%), allow students to democratically decide on how learning will take place (11%), and allow students to choose the mode of assessment (10%). A democratic approach to learning whereby students elect assessments or resources appears to be unpopular among educators.

Regarding the instructional methods encouraged by teachers, 74% allow students to work in pairs or groups, 70% allow students to discuss ideas with other students and the teacher and 60% allow students to reflect on their own learning, engage in inquiry or problem-solving based learning activities (53%), facilitate student self-assessment of their own work (51%), enable students to work alone at their own pace (44%), allow students to suggest alternative teaching, learning and assessment strategies (37%), encourage students to engage in peer assessment of work (36%) and only 11% of teachers allow students to choose which topics to learn. A majority of teachers strongly support a collaborative approach where students discuss ideas with other students and the teacher or work in groups. However, only about one third (36%) strongly encourage peer assessment of work.

5.2.7 Participants' Beliefs on the Potential of Social Media in Education

About half of educators surveyed agree that social media can better facilitate the sharing of experiences, ideas, and advice among professionals/ peers (46%). Two-fifths say students try harder when learning with technology (39%); unfortunately, many believe that the time to integrate social media into instruction is limited (40%), while 35% agreed that social media allows teachers to access online content more easily. Educators surveyed believe that social media should be used to connect students beyond the classroom (36%), that the use of social media increases student motivation (33%), and that the use of social media positively impacts students' higher-order thinking skills (29%). On the other hand, educators felt that social media is a distraction to most students (39%) and that using computers for learning takes student attention away from important instructional time (10%). Twenty seven percent of educators do not believe that the quality of learning is improved by the use of social media.

Insufficient time to integrate social media into their subject areas was cited by 40% of educators, while 11% felt out of place when confronted by technology and 12% said that the use of technology makes their professional work more difficult. Figure 5.21 illustrates some of these concerns regarding the integration of social media in education. Figure 5.22 outlines K-12 educators' agreement on the use of technology in education

5.2.8 Participants' Confidence in their Use of Online Technologies/ Activities

Educators are most comfortable with communicating via e-mail or instant messaging (92%) and social networking (67%); far fewer are comfortable with other online media. About one-in-five are confident in creating (20%) or delivering (18%) online courses while 16% stated confidence in using social media as a teaching tool. Just under half (49%) are confident in producing or editing online documents (e.g. using *Google Docs*), 41% are comfortable capturing, editing, and sharing digital photos or graphics online (e.g. *Flickr*), 27% are confident capturing, editing, and sharing digital movies online (e.g. *YouTube*), 43% are confident in communicating with others using web conferencing tools such as *Skype*, while 44% expressed confidence in collaborating in online communities of practice for teachers. *Figure 5.23* summarises K-2 educators' confidence in using specific social media tools.

5.2.9 Barriers to the Use of Online Technologies/ Activities in K-12 Education

The most obvious barrier to the use of online technologies/ activities in schools according to this survey is the fact that access to social media is restricted in schools as reported by 79% of respondents. Insufficient Internet bandwidth was reported by 44% as a barrier, insufficient numbers of computers, laptops or tablet devices for integration of social media by 65%, school computers not currently functioning (e.g. out of date or need repair) by 33%, and insufficient technical support for teachers using social media in schools by 60%. A number of concerns were also raised by educators in regard to use of social media in schools including perceived lack of privacy and security when using social media (52%), the risk of students being exposed to inappropriate content was cited by 39%, 26% cited cyber bullying, and 18% felt that there is a lack of control on social media in their schools. The feeling that students would spend

too much time on social media activities, e.g. SNSs such as *Facebook* account for 49% and educators surveyed said that it would distract students in their classroom (42%) or negatively impact student learning (19%). Large class sizes not being conducive to integrating social media in classrooms was cited as a barrier by 45%. Too much time required to effectively integrate social media in class was cited by 37%, and a further 46% said that they would be unaware of how to use social media effectively for teaching and learning.

5.3 Follow Up Interviews

An e-mail was sent to the 110 (17%) online survey participants, whose school does not block Internet and social media access, inviting them to participate in follow up interviews, to add depth to some of findings from the online survey. This yielded 10 teachers, with 5 reporting that they taught in elementary schools, 2 in middle schools and 3 in high schools. The variety of subjects or disciplines taught by interview respondents ranged from English language arts, literature, math, US and world history, world languages (French and Spanish). The results of these interviews are discussed here.

5.3.1 Interview Participants Use of Social Media in their Personal Lives

Interviewees were asked if they use social media in their personal or home life. Seven out of nine reported that they did. One of the two who reported not using social media in her personal life was slightly fearful of SNSs and the "*strong opinions*" that could be posted about "*what I am doing, or where I am teaching, or friends that I work with*". (EI6) All personal users of social media reported having a *Facebook* account to keep connected with family and friends around the world. "*I post pictures, and view friends' postings and pictures. I also stay connected with former students and chat online with them occasionally*". (EI3) Other social media used in personal lives included SNSs (*LinkedIn*, *Twitter*) and media sharing tools such as *YouTube* and *Pintrest*. *LinkedIn* was used by two teachers as an online resume, on a limited basis. EI2 reported using *Twitter* to "*follow a variety of news feeds, some of which I use in class…I follow writers, you know I follow the Atlantic and teaching experts that I'm interested in*." Many teachers who used social media in their personal lives also used it to

research possible resources for their classroom use: "*I use Pinterest a lot to get new ideas for the classroom…when I'm looking for something personal, I find something for school and it's like 'heh wait a minute I could use that type of thing so*". (EI8)

5.3.2 Interview Participants Use of Online Technologies/ Social Media for their Professional Development

Nine out of the ten interviewees had engaged in online professional development, with some collaborative element. The kind and variety of online technologies/ social media use for professional development varied greatly from online language courses, to professional development videos on diabetes and bullying, *Skype*, Webinars, etc. Three respondents had completed online Masters programs. One teacher found the convenience of the online course a positive aspect: "*You were in the comfort of your own home and you were able to bounce ideas off of each other and still get the information and get that immediate feedback without having to be actually physically in the classroom*." (EI6) EI8 found an online module on differentiated instruction and instructional design particular good. She further commented that the experience was fun and she received ideas and feedback from people around the country. EI5's experience of group work in an online environment was less satisfying, due to challenges of managing the time constraints and group dynamics, which she admitted happens within face-to-face collaborative settings.

5.3.3 Interview Participants Use of Online Technologies/ Social Media in their Classroom Practice

All but one educator used social media in their classroom practice. The one teacher who reported "*not really*" using social media did talk about her school's 1:1 computing initiative (*Google Nexus* tablets) for students in the coming academic year and familiarising herself with the tablets provided to teachers in advance of this initiative. (EI9)

Many of the interviewees reported researching and accessing resources (EI6) at home that they subsequently bring into their classrooms. One respondent (EI5) mentioned using online technologies to access worksheets and

to research ideas to help students with special educational needs. Educators reported using *Facebook* (or *Remind101*) for a variety of uses including to remind their students of an impending test or to highlight an article that they should read in advance of class. EI7 further gave an example of *Facebook* being used to enable communications overseas: *"we send kids over to France and they come over, and the kids all get connected with Facebook, so I sort of introduce social media that way."* Another exchange with a school in Chile involved this teacher using *Skype,* with her students*: "so they would talk back and forth". (EI7)*

Video is probably the most popular tool used by teachers in classroom practice. Resources such as *You Tube*, *Discovery Education* (a paid subscription channel for schools) are cited by many teachers. Some teachers reported using interactive whiteboards or iPads to access the Internet and other social media activities with their class. A number of teachers reported using blogging technologies, like *Blogspot*, in their classrooms. One of the kindergarten teachers spoke passionately about her use of blogging get her students interested, and convey to parents what they are covering in class. *GoogleDocs* was used by EI4, the History teacher to encourage his students to work together even outside of the classroom. (EI4) He is on the "*look-out*" for a similar "*less clunky*" tool; "*easier for the kids to use and easier for teachers to get into and evaluate."EggsPress*, is used by EI5 to allow children in her class to read books online, answer questions and to progress seamlessly through reading levels (in an adaptive learning model).

All but two teachers confirmed that their personal use of social media positively impacted or influenced their use of social media for their professional development and in turn their use of social media in their classroom practice. A teacher who doesn't use social media in her personal life reported being more likely to integrate social media in her classroom having participated in an online course for professional development.

5.3.4 Potential and Benefits of the Use of Social Media in Education as Expressed by Interviewees

All participants spoke about the potential of social media in education. The following are the key themes that emerged regarding the benefits of social media in education:

- Access to a vast amount of content resources and ideas for teaching and learning
- Access to a professional network or educators; the ability to give and receive ideas
- Convenience of accessing networks from anywhere
- Immediacy of answers to queries
- Ability to communicate information efficiently and quickly, using *Twitter*, for example.
- Ability of learners and educators to connect with others for advice or support
- Availability of authentic, real world scenarios for language students
- Ability to have students respond to non-fiction (political or environmental) topics in a more social way

5.3.5 Concerns in Relation to Use of Social Media in Education, as Expressed by Interviewees

The following is a summary of concerns regarding the use of social media in education:

- The rapidly changing landscape of technology in general; and districts' or schools' ability to keep up or keep pace with this.
- The nature of social media itself in that it allows individuals post whatever they want, without any restrictions: "*For example, I have some kids who are not very happy with me right now so they go and they voice their frustrations on Twitter and everybody sees it and starts the whole ball rolling of this sort of 'gang up against the teacher' sort of thing."(EI6)*
- The potential for students accessing inappropriate content
- Students' over-reliance on technology: "*I'm fearful that we're so technology obsessive that the kids can't just curl up with a book and read paper that they need some type of animation or digital to understand it.*

I find that a little scary." (EI5)

- Security and access to inappropriate content: "*Just a Google search for an image can bring up something that they should not see" (EI5)*
- Exposure to disciplinary measures based on profile information and activity on social networking sites on the part of teachers by school and district administration: "*it turned out that there was some discussion about another teacher on Facebook who was not appropriate and they offered her the opportunity to resign and she did" (EI1)*
- Using technology and social media with "*30 students and 30 sets of technology*" (EI5), or large class sizes can be extremely challenging.
- Fear of the permanent nature of posts on social networking sites.
- Becoming familiar with new technologies.

5.3.6 Interview Participants' School Policy on Social Media Access and Use

All interviewees reported that their school had a policy on Internet and social media usage. The nature of policies varied greatly from "*strict"*(EI1) *to "pretty open"* (EI8). The policies that were discussed covered aspects such as access to the Internet and social media Web sites, specific sites that are blocked, and social networking behaviour. Few interviewees actually referenced a formal document and most spoke anecdotally about their school policy. EI2 said that bringing your own device was frowned upon; more so with teachers as there is a fear of introducing viruses or "*malware*" and theft. Additionally, EI5 finds that: *"things that shouldn't be blocked are blocked…some YouTube sometimes get blocked…some Web sites, I'll find teacher material web sites will be blocked, I don't know how they make that decision".* Another teacher mentioned that accessing of content through *Blackboard* or blogs are fine, but the school '*basically frown[s] on the idea of using something like Facebook to socialise with students".* (EI2) EI4 said that their school disallows "*friending*" of students until after they graduate.

Teachers seemed very balanced on their views regarding social media access policies in their schools. One teacher said that: "*I think it's [school policy on social media] not necessarily strict it's just kind of trying to give us some*

guidance as to what to say and how we say it". (EI7) Another teacher reported that her school was in the process of updating their policy to take account of "*kids who want to bring their own device to school". (EI9)*

5.3.7 Interview Participants' Awareness of State or Federal Policy in Relation to Social Media in Education

Teachers were unanimous in their response to awareness of federal or state policies on social media in education, they were not aware of any. In an effort to answer the question, they talked about the common core state standards or broader policies on child safety or exploitation, or legal cases involving disciplinary procedures for teachers who have engaged in unethical or inappropriate social media behaviour.

5.4 Conclusions

This chapter presented the findings from the online survey and interviews conducted with US K-12 teachers in phase 2 of this research. The data gathered from the online survey comprises mostly quantitative data although some qualitative data were also gleaned, in particular through the 'other' question items. Data gathered in the follow-up interviews was of a qualitative nature and served to add some detail to the rich set of quantitative data gathered in the earlier online survey responses. The educational context (teachers, schools, districts) in which this study was based has been outlined. The findings highlight the rich diversity of online media and activities being used by teachers in their personal lives, for professional development and in classroom practice, albeit at a very low level. The barriers to the use of online technologies have been articulated, and key opportunities and concerns relating to the integration of social media have been detailed. Chapter 6 provides a complete analysis of the data generated in phase 2, including statistical correlations. Chapter 7 includes the final analysis and triangulation of the online survey and interviews conducted, across both phases of the research

Figure 5.18 Phase 2 Frequency of Educator Use of Online and Social Media Activities Within Personal Lives in the Past Year

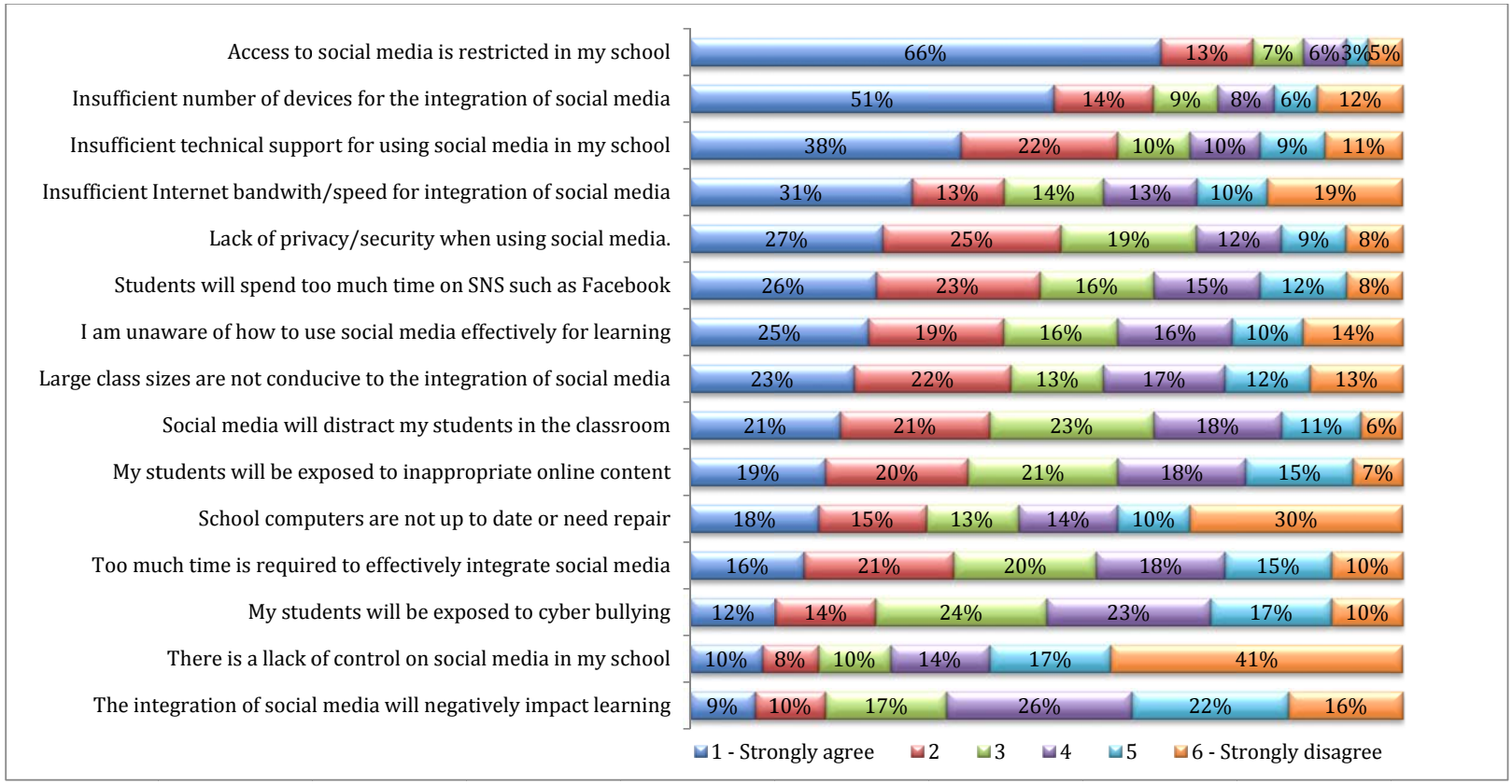
Program	Never	Daily	Weekly	Monthly	A few times per year
E-mail	1%	92%	5%	1%	1%
Social Networking (such as Facebook or LinkedIn)	20%	53%	14%	8%	5%
Real-time chat (such as instant messaging)	39%	19%	17%	13%	12%
Follow or contribute to Microblogs (such as Twitter)	70%	8%	9%	7%	6%
Individually create online documents (e.g., using Googledocs)	52%	7%	13%	13%	15%
Discussion Forums	49%	6%	10%	15%	20%
Interact in a Virtual Learning Environment (e.g. Moodle)	70%	5%	7%	5%	13%
Interact with an online Community of Practice	69%	5%	8%	7%	11%
Share images online (e.g., Flickr)	53%	4%	10%	17%	16%
Blogging	70%	4%	9%	8%	9%
Collaboratively create online documents (e.g., Googledocs)	62%	4%	9%	10%	15%
Share videos online (e.g., via YouTube)	56%	3%	13%	13%	15%
Create Web sites	74%	2%	4%	4%	16%
Video Conference (such as Skype)	49%	2%	12%	12%	25%
Create online presentations (e.g., using Prezi)	74%	2%	6%	5%	13%
Interact in an online classroom (e.g., Wimba or OpenMeeting)	81%	1%	2%	4%	12%
Create Wikis (such as Wikipedia)	86%	1%	3%	2%	8%
Virtual Social World (such as SecondLife)	94%	1%	1%	1%	3%

Figure 5.19 Phase 2Frequency of Educator Use of Online and Social Media Activities Within Professional Development in the Past Year

Program	Never	Daily	Weekly	Monthly	A few times per year
E-mail	24%	42%	13%	11%	10%
Interact in a Virtual Learning Environment (e.g. Moodle)	60%	6%	6%	7%	21%
Social Networking (such as Facebook or LinkedIn)	80%	5%	6%	4%	5%
Interact with an online Community of Practice	68%	4%	6%	8%	14%
Discussion Forums	56%	3%	8%	8%	25%
Individually create online documents (e.g. Googledocs)	59%	3%	9%	9%	20%
Collaboratively create online documents (e.g. Googledocs)	61%	3%	8%	9%	19%
Real-time chat (such as instant messaging)	83%	2%	3%	4%	8%
Create Wikis (such as Wikipedia)	83%	2%	3%	3%	9%
Blogging	77%	2%	6%	6%	9%
Follow or contribute to microblogs (such as Twitter)	85%	2%	4%	3%	6%
Share images online (e.g., via Flickr)	85%	2%	3%	3%	7%
Create web sites	75%	2%	3%	5%	15%
Video Conference (such as Skype)	77%	1%	2%	6%	14%
Share videos online (e.g., via YouTube)	74%	1%	6%	6%	13%
Create online presentations (e.g., using Prezi)	68%	1%	5%	6%	20%
Interact in an online classroom (e.g., Wimba or OpenMeeting)	75%	1%	2%	5%	17%
Virtual World (e.g., Second Life)	94%	1%	2%	1%	2%

Figure 5.20 Phase 2 Frequency of Educator Use of Online and Social Media Activities Within Classroom Practice in the Past Year

Program	Never	Daily	Weekly	Monthly	A few times per year
E-mail	12%	79%	5%	2%	2%
Interact in a Virtual Learning Environment (e.g. Moodle)	64%	10%	10%	6%	10%
Individually create online documents (e.g. Googledocs)	52%	8%	17%	11%	12%
Share videos online (e.g., via YouTube)	60%	4%	11%	14%	11%
Collaboratively create online documents (e.g. Googledocs)	60%	4%	11%	13%	12%
Create web sites	66%	4%	7%	8%	15%
Real-time chat (such as instant messaging)	85%	3%	4%	4%	4%
Social Networking (Such as Facebook of LinkedIn)	88%	3%	3%	3%	3%
Interact with an online Community of Practice	77%	3%	7%	5%	8%
Discussion Forums	71%	2%	7%	8%	12%
Blogging	81%	2%	5%	7%	5%
Share images online (e.g., via Flickr)	77%	2%	5%	6%	10%
Create online presentations (e.g., using Prezi)	61%	2%	10%	10%	17%
Interact in an online classroom (e.g., Wimba or OpenMeeting)	88%	2%	3%	2%	5%
Video Conference (such as Skype)	83%	1%	2%	3%	11%
Create Wikis (such as Wikipedia)	82%	1%	4%	4%	9%
Follow or contribute to microblogs (Twitter)	90%	1%	4%	2%	3%
Virtual World (e.g., Second Life)	95%	1%	1%	1%	2%



*Participants indicated on a scale from 1 to 6 how much they agreed or disagreed with statements, where 1 = Strongly Disagree and 6=Strongly Agree.

Figure 5.21: Phase Two K-12 Educators' Concerns Regarding the Integration of Social Media in Education

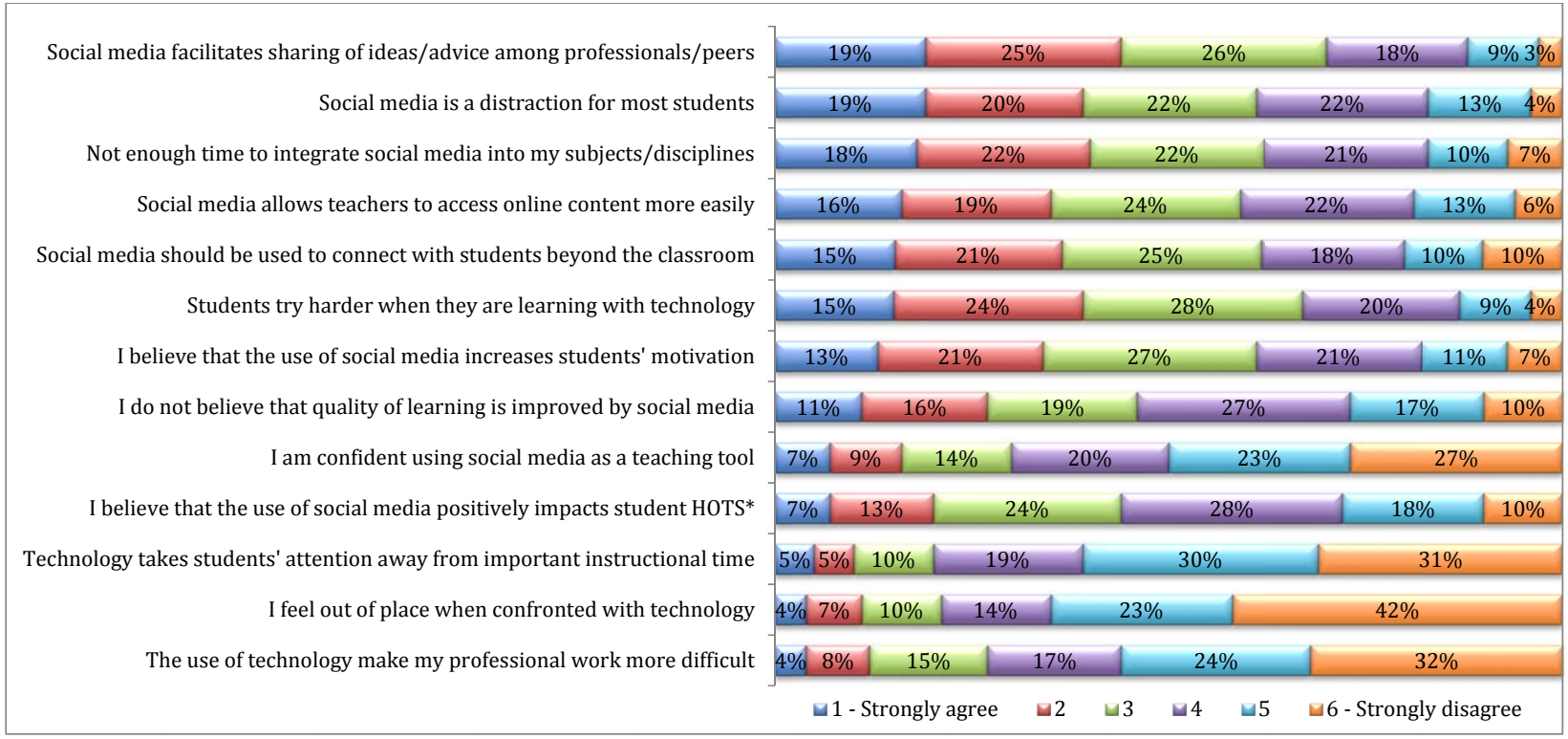
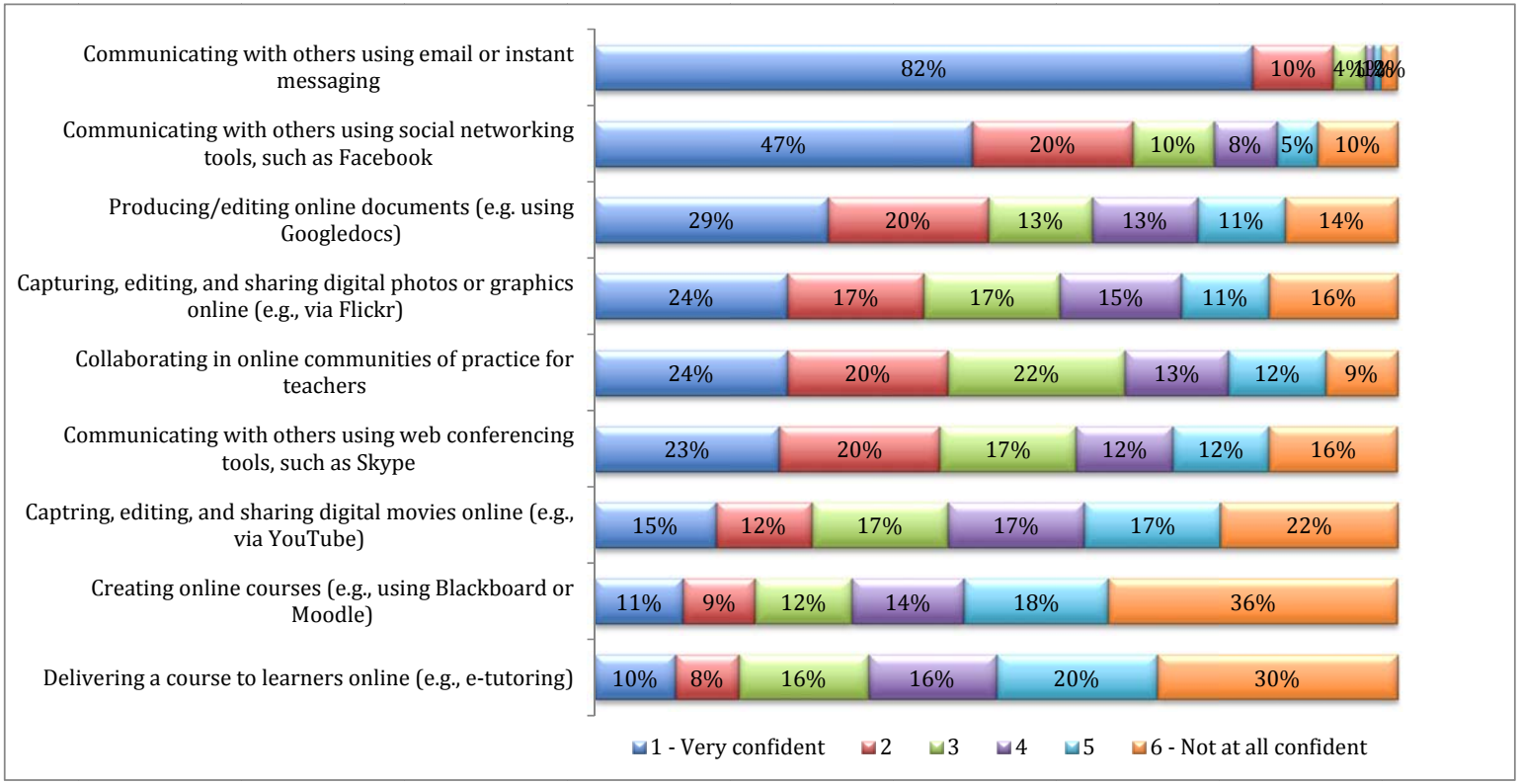


Figure 5.22: K-12 Educator Agreement on the Use Of Technology In Education

*Participants indicated on a scale from 1 to 6 how much they agreed or disagreed with statements, where 1 = Strongly Disagree and 6=Strongly Agree.

Figure 5.23: K-12 Educators' Confidence in Using Social Media

*Participants indicated on a scale from 1 to 6 how confident they were, where 1 = Not at all Confident and 6=Very Confident.



Chapter 6 Data Analysis

6.1 Introduction

This chapter provides the analysis of the quantitative data for phase 2 of this research project. It begins by explaining how the various scales were isolated, and the correlations and other tests undertaken to identify relationships between dependent and independent variables arising. The correlations included: educator use of online technologies in their personal lives, professional development and classroom practice; gender, age, years of teaching experience, attitudes to, and confidence in the use of social media for educational purposes, school level (elementary, middle and high school), school type (public private, charter), school designation (disadvantaged, special educational needs, *Title 1*) and teaching styles of educators in relation to social media use. The discussion ends with an overview of the findings from the micro study carried out with the 110 educators (17%) who reported that social media was not blocked in their schools, to determine if there were significant differences between correlations in the micro study and those examined in the full sample.

6.2 Online Survey

The intent of the second phase of this research was to examine K-12 teachers' use of online technologies, particularly social media, in their personal lives, for their professional development and in their classroom practice, and to see if there was a correlation between these three domains of social media use.

6.2.1 Online Survey - Existing Scales

Data analysed from the online survey in phase 2 yielded the following scales: gender, age, years of teaching experience. This section details each of these scales in relation to the online survey participants:

- *Gender:* was coded on a two-point scale (female = 0, male = 1), predominately female (86%, $n = 545$).

- *Age:* was coded on a six-point scale (Mean = 3.68, SD = 1.14) based on the categories of; 1 (younger than 25 years); 2 (25 to 35 years); 3 (35 to 44 years); 4 (45 to 54 years); 5 (55 to 64 years); and 6 (65 years or older). A majority of participants (54%, *n* = 343) were between the ages of 35 and 54.
- *Years of teaching experience:* was coded on a seven-point scale using the following categories (*Mean* = 4.19, *SD* = 1.00): 1 (less than 1 year); 2 (1-3 years); 3 (4-10 years); 4 (11-20 years); 5 (21-30 years); 6 (31-40 years); and 7 (more than 40 years). A majority of participants (65%, *n* = 408) reported teaching between 4 and 20 years.
- *School level:* respondents were asked to report whether they taught at an elementary school (45%, *n* = 283), a middle school (15%, *n* = 97), a high school (34%, *n* = 215), or another type of school (6%, *n* = 37). The most common 'other' response was a K-12 school (3%, *n* = 11).

6.2.2 Online Survey - Created Scales

The following scales were created based on combining a number of question items to form these scales:

- *Internet access for teaching purposes:* comprised three items asking respondents to report their access to the Internet (desktop, laptop or tablet device with Internet connectivity). Respondents rated their access on a three-point scale (No = 0, Sometimes = 1, Yes = 2). Those items were summed, with a range of 0 to 8 (Mean = 2.74, *SD* = 1.86), with higher scores indicating greater Internet access. A Cronbach's α = .33 suggesting that the scale had low internal consistency.
- *Blocked Social Media:* comprised five items that respondents recorded whether their school district blocked certain types of social media Websites (SNSs such as *Facebook*, blogging sites such as *Twitter*, Web-based communication such as *Skype*, Instant Messaging such as *MSN* or other please explain). Respondents rated their social media access on a two-point scale (no = 0, yes = 1). Those five items were summed, with a range of 0 to 5 (*Mean* = 2.47, *SD* = 1.56), with higher scores indicating less access to social media sites. A Cronbach's α = .73 suggested the scale had good internal consistency. Seventeen percent of

participants (n = 110) reported that their schools did not block any social media sites.

- *Online technologies/ activity use in personal lives of teachers*: online survey participants responded on 18 items in terms of how often they engage in various activities (e.g. blogging). A five-point scale was used to code responses: 0 (never); 1(a few times a year); 2 (monthly); 3 (weekly); 4 (daily). Those 18 items were summed with a range of 0 to 72 (*Mean* = 18.34, *SD* = 11.01) with higher scores indicating greater use of social media in respondents' personal life. A Cronbach's α = .85 suggested that the scale had good internal consistency.
- *Online technologies/ activity use in the professional development of teachers:* online survey participants responded on 18 items in terms of how often they engage in various activities (e.g. blogging) in their professional development. A five-point scale was used to code responses: 0 (never); 1(a few times a year); 2 (monthly); 3 (weekly); 4 (daily). Those 18 items were summed with a range of 0 to 72 (*Mean* = 10.51, *SD* = 10.91) with higher scores indicating greater usage of social media in respondents' professional development practice. A Cronbach's α = .90 suggested that the scale had good internal consistency.
- *Online technologies/ activity use in the classroom practice of teachers:* online survey participants responded on 18 items in terms of how often they engage with various activities (e.g. blogging) in their classroom practice. A five-point scale was used to code responses: 0 (never); 1(a few times a year); 2 (monthly); 3 (weekly); 4 (daily). Those 18 items were summed with a range of 0 to 72 (*Mean* = 12.41, *SD* = 10.42) with higher scores indicating greater usage of social media in respondent's classroom practice. A Cronbach's α = .87 suggested that the scale had good internal consistency.
- *Educators' attitudes towards social media in education:* A six-point scale was used to code respondents' feelings (e.g., *I believe that the use of social media increases learners' motivation*); 1(strongly disagree) to 6 (strongly agree). Those 5 items were summed with a range of 5 to 30 (*Mean* = 17.93, *SD* = 5.32.) with higher score indicating more positive attitudes toward social media. A Cronbach's α = .80 suggested that the scale had good internal consistency.

- *Educators' confidence in using social media*: nine items were used to measure respondents' confidence in using different social media tools (e.g. *communicating with others using SNSs, such as Facebook*). Respondents rated their agreement to those 9 items on a six-point scale; 1(strongly disagree) to 6 (strongly agree). The 9 items were summed with a range of 9 to 54 (M*ean* = 34.76, *SD* = 10.21) with higher scores indicating greater confidence using social media. A Cronbach's α = .87 suggested that the scale had good internal consistency.
- *Educators' Teaching Approaches:*
    - *Student-centred teaching approach:* respondents were asked to report on six items regarding how on a daily basis they use teaching practices that are student-centred (e.g., *I encourage students to engage in peer assessment of work*). Respondents rated their agreement to those five items on a six-point scale 1 (strongly disagree) to 6 (strongly agree). Those six items were summed with a range of 6 to 54 (M*ean* = 27.32, *SD* = 5.40) with higher scores indicating greater usage of student-centred teaching practices. A Cronbach's α = .79 suggested that the scale had good internal consistency.
    - *Educators' willingness to receive feedback from students and peers on their teaching style:* respondents were asked to report on four items regarding how on a daily basis they use teaching practices that elicit feedback from students and colleagues (e.g., *Ask students to provide feedback on my teaching, learning and assessment strategies*). Respondents rated their agreement to those four items on a six-point scale 1 (strongly disagree) to 6 (strongly agree). Those four items were summed with a range of 6 to 24 (*Mean* = 15.90, *SD* = 4.15) with higher scores indicating greater soliciting of teaching feedback. A Cronbach's α = .67 suggested that the scale had moderate internal consistency.
    - *Educators' style in facilitating students to take control of their own learning:* The 6 item scale had respondents report on a daily basis how often they used teaching practices that provided students with options for learning (e.g., *Allow students to democratically decide on how the learning will take place*). Respondents reported their frequency

engaging in these practices on a six-point scale (Strongly Disagree = 1 to Strongly Agree = 6). Those six items were summed with a range of 6 to 30 (*Mean* = 15.10, *SD* = 5.40) with higher scores indicating greater student-centred teaching approach. A Cronbach's α = .81 suggested that the scale had good internal consistency.

Table 6.1 displays the means, standard deviations, minimum, and maximum responses for the aforementioned items.

Table 6.1: Primary Descriptive Statistics for Scales Created for Correlational Analyses For All Participants (*N* = 632).

Scale	*Mean*	*SD*	*Min*	*Max*
Internet access for teaching purposes	2.74	1.86	.00	8.00
Blocked social media	2.47	1.56	.00	5.00
Online technologies/ activity use in the personal lives of teachers	18.34	11.01	.00	63.00
Online technologies/ activity use in the classroom practice of teachers	12.41	10.42	.00	64.00
Online technologies/ activity use in professional development	10.51	10.91	.00	72.00
Educators' attitudes towards social media in education	17.93	5.32	5.00	30.00
Educator's confidence in using social media	34.76	10.21	9.00	54.00
Educators' student-centred teaching approach	27.32	5.40	9.00	36.00
Educators' willingness to receive teaching feedback	15.90	4.15	4.00	24.00
Educators' style in facilitating students to take control of their own learning	15.10	5.40	5.00	30.00

Notes: SD = Standard Deviation

6.2.3 Online Survey Phase 2- Principal Component Analysis

Teachers were provided a list of 19 different teaching techniques and asked to rate on a six-point scale (1 = Strongly Disagree to 6 = Strongly Agree) how often they engaged in each practice on a daily basis. In order to assess the dimensionality of the nineteen items, a Principal Component Analysis (PCA) was performed with Varimax rotation to provide for a simpler solution. (Warner 2008) Components were retained if they had an

eigen value greater than one and a component loading of .4 was used as a cut-off to classify items into a component. The rotated solution revealed that the data could best be represented by four components, which accounted for a total of 52% of the variance in respondents' scores. One item (*Mainly promote assessment in the form of written examinations*) failed to load onto a component and was not retained.

The first component, labeled *Student-Centred Teaching Approach,* consisted of five items (Cronbach's α = .81) and was comprised of teaching practices that allowed students greater choice in how they learned (e.g., *Allow students to democratically decide on how the learning will take place*) and accounted for 17% of the variance in teachers' scores after rotation. The second component, labeled *Educator Style in Facilitating Students to take control of their own Learning*, consisted of six items (Cronbach's α = .79) and was comprised of teaching practice in which students were in control of their learning (e.g., *Engage in enquiry or problem-based learning activities*) and accounted for 16% of the variance in teachers' scores. The third component, labeled *Educators' willingness to receive feedback from students and peers*, consisted of four items (Cronbach's α = .67) that described teaching practices in which the teacher attempts to receive feedback about his/ her performance (e.g., *Invite other teachers to observe and critically review my teaching and learning approaches*) and accounted for 10% of the variance in teachers' scores.

6.3 Correlational Results

Correlations are presented for online technologies/ activities usage in teachers' personal lives, their professional development and their classroom practice. In addition, correlations are presented for age, years of teaching experience, teacher confidence, and teaching styles in relation to K-12 teachers' use of social media.

6.3.1 Associations Among Teachers' Personal, Professional Development and Classroom Practice Use of Online Technologies/ Activities

Strong positive correlations were found between K-12 educators' personal use of online technologies/ activities and their subsequent use of online technologies for professional development as shown in Table 6.2. Furthermore strong positive correlations were found between K-12 teachers' use of online activities in their professional development

and their subsequent use of these technologies in their classroom practice. In looking at the three different school levels (elementary, middle and high school), slightly lower correlations were found among elementary school teachers (see tables 6.2a, 6.2b, and 6.2c). Among middle school teachers, the magnitude of the correlations was considerably larger than either elementary school teachers or high school teachers. This finding indicated that online technologies usage among these teachers was more closely related. Thus, middle school teachers were either more likely to use online activities when compared to elementary and middle school teachers. In high school, teachers' correlation was higher for personal use of online technologies and professional development, although the correlation between personal use of online technologies and classroom practice was lower.

Table 6.2: Associations Among Personal, Professional Development and Classroom Online Technologies Use for the Entire Sample ($N = 632$).

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.63**	--
Classroom	.67**	.76**

Table 6.2a: Associations Among Personal, Professional Development and Classroom Online Technologies Use for Elementary School Teachers ($n= 283$).

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.52**	--
Classroom	.63**	.75**

Table 6.2b: Associations Among Personal, Professional Development and Classroom Online Technologies Use for Middle School Teachers ($n = 97$).

	Personal OTA	PD OTA

Personal OTA	--	
PD OTA	.75**	--
Classroom	.78**	.87**

Table 6.2c: Associations Among Personal, Professional Development and Classroom Online Technologies Use for High School Teachers (n = 215).

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.60**	--
Classroom	.59**	.69**

Note:**$p \leq .01$. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use.

6.3.2 Associations Among Teachers' Personal, Professional Development and Classroom Practice Use of Online Technologies/ Activities, Removing E-mail

E-mail formed a very significant percentage of teachers daily online activities across the three domains of personal (92%), professional development (42%) and classroom practice (79%). A further correlational analysis was conducted, to assess if similar associations were found in the absence of e-mail. Slightly stronger correlations were found for the full cohort of K-12 educators' use of online technologies/ activities in professional development and in classroom practice (rs= .76 - .80), than when e-mail was included in the correlation. Tables 6.3, 6.3a, 6.3b, and 6.3c reflect the correlation results for K-12, elementary, middle and high school teachers respectively in relation to their online activities, having removed e-mail. With regard to correlations among the three school levels, correlations were slightly higher for elementary school teachers for classroom integration. At high school level, weaker correlations were found overall, while at middle school, the strongest correlations between personal, professional and classroom use of online technologies are evident, similar to the earlier section results including e-mail.

These findings suggested that online activities usage was more concentrated across the sample. With regard to correlations among the three school levels, correlations were slightly higher for elementary school teachers for classroom integration. At high school level, weaker correlations were found overall, while among middle school teachers, the strongest correlations are evident, similar to the earlier results (section 6.2.1 in this chapter) for correlations that included e-mail. As these analyses indicated, the utilisation of online technologies/ activities are greatest among middle school teachers, which indicates a more concerted effort among these teachers to either use all three types of social media or not.

Table 6.3: Associations Among Personal, Professional Development, and Classroom Use of Online Technologies/ Activities for the Entire Sample (N = 6323), Removing E-mail.

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.66**	--
Classroom	.69**	.80**

Table 6.3a: Associations Among Personal, Professional Development, and Classroom Use of Online Technologies/ Activities for Elementary School Teachers (n = 283), Removing E-mail.

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.55**	--
Classroom	.65**	.80**

Table 6.3b: Associations Among Personal, Professional Development, and Classroom Use of Online Technologies/ Activities for Middle School Teachers (n = 97), Removing E-mail.

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.78**	--
Classroom	.79**	.89**

Table 6.3c: Associations Among Personal, Professional Development, and Classroom Use of Online Technologies/ Activities for High School Teachers (*n* = 215), Removing E-mail.

	Personal OTA	PD OTA
Personal OTA	--	
PD OTA	.62**	--
Classroom	.61**	.70**

Note:**$p \leq .01$. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use.

6.3.3 Associations Among Teachers' Personal, Professional Development and Classroom Practice Use of Social Media (for Eight Common Social Media Activities)

As the previous analyses indicated, changing the composition of the online activities i.e., e-mail impacted the strength of correlation between personal, professional development, and classroom use of online activities. In light of this, eight specific activities that constituted "common" social media activities (i.e., discussion forums, real-time chat, create wikis, blogging, social networking, follow or contribute to micro-blogs, share images online, and share videos online) were isolated, to examine if the correlations existed for social media usage. Bivariate correlations were conducted for these new 8-item social media use scales, and are presented in tables 6.4 to 6.4c.

Table 6.4 Associations Among Eight Common Personal Social Media Use, Professional Development Social Media Use, and Classroom Social Media for the Entire Sample (*N* = 632).

	Personal SM	PD SM

Personal SM	--	
PD SM	.58**	--
Classroom SM	.57**	.75**

Interestingly, the magnitudes of the correlations between teachers' personal, professional development and classroom use of social media using these scales were the weakest. Compared to sections 6.3.1 and 6.3.2, while there were positive correlations across all K-12 teachers, using only these 8 "common" social media activities resulted in the lowest correlations (*r*s = .50 - .80) between teachers' personal, professional development and classroom use of social media for the entire sample. These results did mirror similar findings to earlier correlations when looking at the relation between social media use as a function of grade level. Elementary school teachers reported the weakest associations between personal social media use and professional development social media use and classroom social media use. Again, the strongest relationships existed among middle school teachers for these associations.

Now, similar to previous results, the differences reported here comprise relatively small fluctuations in terms of the magnitude of the overall correlations. In all three sections all correlations were positive and moderate to moderately strong in magnitude. But, the results suggest that isolating social media activities does impact the strength of the correlations in the use of social media across the different contexts. This was especially true in section 6.3.2, in which removing an online activity that has become rather ubiquitous in all aspects of life (i.e., e-mail) led to increases in the strength in the association among all three domains of social media use. Future research needs to be cognisant of how these terms are operationally defined. As more online activities become commonplace, it is possible that finding teachers that do not engage in certain "social media" activities may become more difficult to define and study in the future. Further researchers should investigate, how the wide scale adoption of certain online behaviours, rarely performed only a decade ago, impacts teacher practices and student learning.

Table 6.4a Associations Among Eight Common Social Media Tools in Personal Use, Professional Development Use, and Classroom Use for Elementary School Teachers (*n*= 283).

	Personal SM	PD SM
Personal SM	--	
PD SM	.50**	--
Classroom SM	.54**	.75**

Table 6.4b Associations Among Eight Common Social Media Tools in Personal Use, Professional Development Use, and Classroom Use for Middle School Teachers (n = 97).

	Personal SM	PD SM
Personal SM	--	
PD SM	.65**	--
Classroom SM	.67**	.80**

Table 6.4c Associations Among Eight Common Social Media Tools in Personal Use, Professional Development Use, and Classroom Use for High School Teachers (n = 215).

	Personal SM	PD SM
Personal SM	--	
PD SM	.56**	--
Classroom SM	.56**	.67**

Note:**$p \leq .01$. Personal SM = Personal Social Media Use; Classroom SM = Classroom Social Media Use; PD SM = Professional Development Social Media Use.

6.3.4 Associations Among Age and K-12 Educators' Use of Online Technologies/ Activities

The associations among age and the use of online technologies/ activities across the three domains are presented in Table 6.5, for the entire sample (N = 632). There was a significant, negative correlation among age and online technologies/ activities usage across the personal, professional and classroom domains (rs = -.18 - -.23, p< .001), indicating that younger teachers were more likely to report using online technologies/ activities when compared to older teachers.

Table 6.5 Association Among Age and Online Technologies/ Activities Usage Within Entire Sample (N = 632).

	Personal OTA	Classroom OTA	PD OTA
Age	--		
Personal OTA	-.23	--	
Classroom OTA	-.22	.67	--
PD OTA	-.18	.63	.76

The associations among age and use of online activities among elementary, middle, and high school teachers are presented in Tables 6.5a to 6.5c- (n = 595). [The reduced number of teachers in this sample is as a result of the removal of those teachers taught across grades, which would have skewed results] Results were similar across the three school levels, with age being negatively correlated to online activities usage (rs = - 06 - -41). The strongest relationships among age and online activities usage (for all three domains of social media use) were evident among middle school teachers (rs = -.39- -41, p< .001), suggesting a greater divide among teachers at this level with younger teachers being considerably more likely to use online activities than older teachers. In contrast, high school teachers had the weakest associations among age and online activities usage (rs = -.06 - -.18) with the association between age and online activities usage in professional development not being significant (r = -.06, p = .42). This suggests that there is less variability among high school teachers when it comes to their age and their online activities usage.

Table 6.5a: Association Among Age and Educators' Use of Online Technologies/ Activities in Elementary School (n = 283).

	Personal OTA	Classroom OTA	PD OTA
Age	--		
Personal OTA	-.24	--	
Classroom OTA	-.13	.63	--
PD OTA	-.15	.52	.75

Table 6.5b: Association Among Age and Educators' use of Online Technologies/ Activities in Middle School (n = 9).

	Personal OTA	Classroom OTA	PD OTA
Age	--		
Personal OTA	-.39	--	
Classroom OTA	-.40	.78	--
PD OTA	-.41	.75	.87

Table 6.5c: Association Among Age and Educators' Use of Online Technologies/ Activities in High School (n =215).

	Personal OTA	Classroom OTA	PD OTA
Age	--		
Personal OTA	-.15*	--	
Classroom OTA	-.18**	.59*	--
PD OTA	-.06	.60	.68*

Note: *$p \leq .05$, **$p < .01$. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use

6.3.5 Associations Among Years of Teaching Experience and K-12 Educators' Use of Online Technologies/ Activities

The association among years of teaching experience and use of online technologies/ activities are presented in Table 6.6 for the entire sample (N = 632). There was a significant, negative correlation among age and use of online technologies/ activities (rs = -.10 - -.21, $p < .01$) in all three domains, indicating that teachers with fewer years of teaching experience were more likely to report using online activities when compared to teachers with more years of teaching experience. It should be noted that age and years of teaching are highly correlated (r = .66, $p < .001$).

Table 6.6: Association Among Years of Teaching and Educators' Use of Online Technologies/ Activities: Entire Sample (N = 632).

	Personal OTA	Classroom OTA	PD OTA
Years Teaching	--		
Personal OTA	-.21	--	
Classroom OTA	-.18	.67	--
PD OTA	-.10	.63	.76

Note: all *p*s ≤.01. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use

The associations among years of teaching experience and use of online technologies/ activities across elementary, middle, and high school teachers are presented in tables 6.7a-6.7c (n = 595). Results were similar across all three school levels, with years of teaching being negatively correlated to online technologies/ activities usage (rs = - 01 - -34). Similar to the results reported for age, the strongest relationships among years of teaching experience and use of online technologies/ activities (in teachers' personal lives, for professional development and classroom practice) were evident among middle school teachers (rs = -.23 - .41, p< .001), suggesting a greater divide among teachers at this level with teachers with less years teaching being considerably more likely to use online technologies/ activities than teachers with more years of experience. Again, high school teachers had the weakest associations among years of teaching and online technologies/ activities with only one association among this group of teachers being significant-the slight negative association between years of teaching and personal use of online technologies/ activities (r = -.17, p = .01). See Tables 6.7a-6.7b for the results at elementary, middle and high school level.

Table 6.7a: Association Among Years of Teaching and Use of Online technologies/ Activities For Elementary School Teachers (n = 283).

	Personal OTA	Classroom OTA	PD OTA
Years Teaching	--		
Personal OTA	-.25	--	
Classroom	-.20	.63	--

OTA			
PD OTA	-.17	.52	.76

Table 6.7b: Association Among Years of Teaching and Use of Online Technologies/ Activities For Middle School Teachers (n = 97).

	Personal OTA	Classroom OTA	PD OTA
Years Teaching	--		
Personal OTA	-.34	--	
Classroom OTA	-.31	.78	--
PD OTA	-.23	.75	.87

Table 6.7c: Association Among Years of Teaching and Use of Online Technologies/ Activities For High School Teachers (n = 215).

	Personal OTA	Classroom OTA	PD OTA
Years Teaching	--		
Personal OTA	-.17*	--	
Classroom OTA	-.11	.59*	--
PD OTA	-.01	.60*	.68*

Note: all PS $\leq$.01. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use

6.3.6 Association Among Gender and K-12 Educators' Use of Online Technologies/ Activities

The associations among gender and the use of online technologies/ activities are presented in table 6.18 for the entire sample (N = 632). Even though the sample was predominately female (86%, n = 545), there were small, positive correlations among males and the use of online technologies/ activities (rs = .14 - .18, $p \leq .001$) across all three domains. These results suggest that males were more likely than females to use online technologies/ activities in their personal lives for professional development and classroom practice. (Table 6.8)

Table 6.8: Association Among Gender and Use of Online Technologies/ Activities, Entire Sample (N = 632) [where, Female=O, Male=1].

	Personal OTA	Classroom OTA	PD OTA
Gender	--		
Personal OTA	.14	--	
Classroom OTA	.18	.67	--
PD OTA	.14	.63	.76

Note: all ps $\leq$.001. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use

The associations among gender and use of online technologies/ activities as a function of school level (elementary, middle or high school) are presented in Tables 6.8a-6.8c (n = 595). Some interesting patterns emerged. Even though elementary school teachers were overwhelmingly female (97%, n = 275), there were significant positive associations among males and their use of online technologies/ activities in the classroom (r = .24, p < .01), and in professional development (r = .18, p < .01). While at the middle school level and high school level there were proportionally more males than at elementary school level (25% and 24%, respectively), the associations among gender and use of online technologies/ activities were very different. At the high school level, gender was not related to the use of online technologies/ activities in any of the contexts (see Table 6.8c). In contrast, gender was related to the use of online technologies/ activities across all three contexts of personal, professional and classroom practice in middle school, with males being significantly more likely to use online technologies/ activities, with the magnitude of the associations being larger than the associations found among elementary school teachers (see Tables6.8-6.8c).

Table 6.8a: Association Gender and Use of Online Technologies/ Activities For Elementary School Teachers (n = 283).

	Personal OTA	Classroom OTA	PD OTA
Gender	--		
Personal OTA	.09	--	

Classroom OTA	.24*	.63*	--
PD OTA	.18*	.52*	.75*

Table 6.8b: Association Gender and Use of Online Technologies/ Activities For Middle School Teachers (n = 97).

	Personal OTA	Classroom OTA	PD OTA
Gender	--		
Personal OTA	.44	--	
Classroom OTA	.39	.78	--
PD OTA	.29	.75	.87

Table 6.8c: Association Gender and Use of Online Technologies/ Activities For High School Teachers (n = 215).

	Personal OTA	Classroom OTA	PD OTA
Gender	--		
Personal OTA	-.07	--	
Classroom OTA	-.06	.59*	--
PD OTA	-.01	.60*	.68*

Note: *$p \leq .01$. Personal OTA = Personal Online technologies/ activity use; Classroom OTA = Classroom Online technologies/ activity use; PD OTA = Professional Development Online technologies/ activity use

6.3.7 Correlation Among Age and K-12 Teachers' Attitudes Towards Social Media

The associations among age and attitudes toward social media use for the entire sample (N = 632) revealed a significant, negative correlation among age and attitudes toward social media (r = -.15, p< .001) indicating that younger teachers had more positive attitudes toward the use of social media than older teachers. A partial correlation controlling for teachers use of social media in the classroom and social media use in professional development still revealed that age was negatively associated with attitudes toward social media (r_p = - .10, p = .01). Overall, both analyses revealed a somewhat small association between age and attitudes toward social media.

The associations among age and attitudes toward social media use as a function of school level is presented in Table 6.9 (n = 595). The trends were similar across school type, with age being negatively correlated with attitudes toward social media. However, while there were significant associations, both the zero-order correlations and partial correlations (controlling for online technologies/ activities in the classroom and within professional development), among age and attitudes among elementary school teachers, there was no association among age and attitudes among middle school teachers. This could have been an issue of sample size, as the magnitudes of the associations were similar for all three school levels, but the overall sample contained proportionally less teachers at middle school level. At high school, there was a significant negative correlation between attitudes and age (r = -.16, p = .02); but that relation was no longer significant when controlling for online technologies/ activities usage in classroom and in professional development.

Table 6.9: Association Among Age and Attitudes toward Social Media as a School Level (Grade Level).

	Elementary School (n = 283)	Middle School (n = 97)	High School (n = 215)
Age r	-.15**	-.14	-.16*
Age r_p	-.12*	-.03	-.11

Note: *p< .05, **p< .01 r = zero order, bivariate correlation; r_p= partial correlation controlling for social media use in the classroom and social media use in professional development

6.3.8 Correlation Among K-12 Teachers' Years of Teaching Experience and their Attitudes Towards Social Media Use

The correlation among K-12 teachers' years of teaching experience and their attitudes toward social media use for the entire sample (N = 632) indicated that there was no association (r = -.06, p = .16) between the two variables. Follow-up analyses indicated that controlling for teachers' professional development and classroom use of online technologies/ activities had no effect on the association between years of teaching experience and attitudes towards social media (r_p = - .02, p = .69); further, controlling for teacher age also failed to reveal any relation between years of teaching and attitudes toward social media (r_p = .05, p = .15). These results suggest that the amount of years a teacher has been teaching has no relation to his/ her attitudes toward social media. The associations among years of teaching and attitudes toward social media use as a function of school level is presented in Table 6.10 (n = 595). The trends were similar across school level as there was no association between years of teaching experience and attitudes towards social media (rs = -.11 - .01 p> .05). Again, regardless of school level, there appears to be no relation between the years a teacher has been teaching and his/her attitudes toward social media.

Table 6.10: Association Among Years of Teaching and Attitudes toward Social Media as a School Level.

	Elementary School (n = 283)	Middle School (n = 97)	High School (n = 215)
Years of Teaching r	-.01	-.04	-.11

Note: *p< .05

6.3.9 Access to the Internet and School Type - Public, Private or Charter School

To examine if the school level (n = 627) had an effect on teachers' access to the Internet, an Analysis of Variance (ANOVA) was performed. School type (Public, Private, Charter) was the independent variable and Internet Access (Range 0-8) was the dependent variable. The results indicated that there was no effect of school type on the level of Internet access teachers reported (F(3, 628) = 1.75, p =.16, η^2 = .01). The means are presented in Table 6.11. Teachers across public, private and charter schools reported approximately the same level of Internet access, with teachers indicating a moderate level of Internet access. It is important to note that the vast majority of teachers in the current study were from public schools (94%, n = 593) so any

differences between these groups that may exist would be difficult to estimate given the unbalanced nature of the current sample.

Table 6.11: Means and Standard Deviations for Entire Access as a Function of Type of School.

	Internet Access *Mean* (*SD*)
Public School (*n* = 593)	2.75(1.84)
Private School (*n* = 24)	3.00 (2.27)
Charter (*n* = 10)	2.40 (1.58)

Note: *p< .05; SD = Standard Deviation

To further examine the effect of school level on Internet access, whether the type of school (*n* = 595) and school level had differential effects on Internet access was examined. To conduct this analysis, a 3X 3 ANOVA with school level (elementary, middle and high school) and type of school (Public, Private, Charter) as the independent variables and Internet access (Range 0 to 8) as the dependent variable was computed. Those results indicated that there was no effect of school level ($F(3, 591) < 1$, $p = .74$, $\eta^2 < .001$) type of school ($F(3, 591) < 1$, $p = .55$, $\eta^2 < .001$) nor did the interaction between school level and type of school have an impact ($F(3, 591) < 1$, $p = .98$, $\eta^2 < .001$). Table 6.12 presents the means and standard deviations for this analysis. As portrayed in Table 6.11, teachers from the various types of school and school levels all reported very similar Internet access.

Table 6.12: Means and Standard Deviations for Internet Access as a Function of Type of School and School Level (Grade Level).

	Elementary School (*n* = 283)	Middle School (*n* = 97)	High School (*n* = 215)
	Internet Access *Mean* (*SD*)	Internet Access *Mean* (*SD*)	Internet Access *Mean* (*SD*)
Public School (*n* = 566)	2.68 (1.81)	2.63 (1.83)	2.86 (1.91)
Private School (*n* = 19)	3.17 (2.71)	2.00 ( )	3.17 (1.70)

Charter (n = 8)	3.33 (1.53)	2.67 (.58)	3.00 (1.41)

Note: *p< .05; SD = Standard Deviation; Empty parentheses indicate no standard deviation as score is based on one respondent.

6.3.10 Access to the Internet and School Designation

In the survey, respondents were asked to categorise themselves as either a disadvantaged school (n = 115, 18%), a special educational needs school (n = 79, 13%), or 'other' (n = 69, 11%). Of the 'other' category, the majority indicated being designated a *Title 1* school (n = 47, 7%). Overall, a total of 212 (34%) teachers reported being in at least one of the underperforming school designation categories. First, a series of correlations was performed to examine if being designated either a disadvantaged school (Dummy Coded No = 0, Yes = 1), a special educational needs school Dummy (Coded No = 0, Yes = 1), a *Title 1* school (Dummy Coded No = 0, Yes = 1), or any designation (Dummy Coded No = 0, Yes = 1) was associated with Internet access.

The results depicted in Table 6.13 indicated that only being designated a *Title 1* school had school had a small impact (r = -.10, p = .02) on Internet access. This result suggests that teachers in a *Title 1* school tend to have less Internet access than teachers not in a *Title 1* school (Table 6.13a). These results do need to be interpreted cautiously as they are based on a relatively small sample. All other associations were not significant, indicating that teachers from the other designated schools tended to have the same level of Internet access as not designated school teachers.

Table 6.13: Associations Among School Designations and Internet Access.

	Internet Access	Disadvantaged	Special Needs	*Title 1*
Internet Access	--			
Disadvantaged	.02	--		
Special Needs	.06	.26**	--	
Title 1	-.10	-.06	.02	--
Any Designation	-.06	-.66**	-.53**	-.40**

Note: * p <.01, ** p< .01

As a follow up to the correlation between being a teacher in a *Title 1* designated school and Internet access, whether that association varied as a function of school level, was examined. Those results are presented below in Table 6.13a. While none of the associations were significant, the magnitude of the correlations were similar, indicating that the strength of the association between teaching at a *Title 1* designated school and Internet access was the same regardless of the type of school, with those teachers tending to report a little less Internet access than teachers in non-designated *Title 1* schools.

Table 6.13a: Association between Internet Access and Being A *Title 1* Designated as a Function of School Level (Grade Level).

	Elementary School (n = 283)	Middle School (n = 97)	High School (n = 215)
Internet Access	-.11^{+}	-.11	-.07

Note: ^{+}p <.10; * p< .05,

6.3.11 Blocking of Social Media Sites and Public, Private, Charter School Type

To examine if public, private, charter school (n = 627) had an effect on blocking of social media, an Analysis of Variance (ANOVA) was performed. School type (Public, Private, Charter) was the independent variable and Blocking of Social Media (Range 0-5) was the dependent variable. The results indicated that there was a significant effect of school type on the blocking of social media (F(2, 625) = 6.17, p< .001, η^2 = .02). The means are presented in Table 6.14. The results did indicate that teachers at private schools reported having more social media sites blocked when compared to either public school teachers or charter school teachers. While these results are based on a small sample, it is interesting to note that teachers at charter schools (n = 10) reported no blocking of social media sites.

Table 6.14: Means and Standard Deviations for Social Media Access as a Function of Type of School.

	Social Media Access *Mean* (*SD*)
Public School (n = 593)	.17^{a} (.37)

Private School (n = 24)	42[b] (50)
Charter (n = 10)	00[a] (.00)

Note: Means with different superscripts are significant at $p < .01$; SD = Standard Deviation

Whether the type of school (n = 595) and school level had differential effects on blocking of social media was examined. To conduct this analysis, a 3X 3 ANOVA with school level (elementary, middle and high school) and type of school (Public, Private, Charter) as the independent variables and Blocking of Social Media (Range 0 to 5) as the dependent variable was computed. Those results indicated that there was no effect of school level ($F(3, 591) < 1$, $p = .53$, $\eta^2 < .001$), but a main effect for Type of School ($F(3, 591) = 5.71$, $p = .003$, $\eta^2 = .02$). There was no significant interaction between school level and type of school $F(3, 591) < 1$, $p = .44$, $\eta^2 < .001$). Table 6.14a presents the means and standard deviations for this analysis. As the previous results and this current ANOVA suggests, teachers at private schools reported having more social media sites blocked, at all school levels, when compared to teachers in public schools or in charter school.

Table 6.14a: Means and Standard Deviations for Social Media Access as a Function of Type of School and School Level (Grade Level).

	Elementary School (n = 283)	Middle School (n = 97)	High School (n = 213)
	Social Media Access *Mean* (*SD*)	Social Media Access *Mean* (*SD*)	Social Media Access *Mean* (*SD*)
Public School (n = 566)	.19 (.39)	.11 (.31)	18 (.39)
Private School (n = 19)	.50 (.55)	1.00 ( )	.33 (.49)
Charter (n = 8)	.00 (.00)	.00 (.00)	.00 (.00)

Note: *$p < .05$; SD = Standard Deviation; Empty parentheses indicate no standard deviation as score is based on one respondent.

6.3.11.1 Blocking of Social Media Sites and School Designation – Disadvantaged, Special Educational Needs and Other

A series of analyses were performed to examine if teachers' school designation had an effect on the blocking of social media sites. In the survey, respondents were asked to categorise themselves as either a disadvantaged school (n = 115, 18%), a special educational needs school (n = 79, 13%), or 'other' (n = 69, 11%). Of the 'other' category, the majority of those individuals indicating being designated a *Title 1* school (n = 47, 7%). Overall, a total of 212 (34%) teachers reported being in at least one of the underperforming school designation categories. A series of correlations was first performed to examine if being designated either a disadvantaged school (Dummy Coded No = 0, Yes = 1), a special educational needs school Dummy (Coded No = 0, Yes = 1), a Title School (Dummy Coded No = 0, Yes = 1), or Any Designation (Dummy Coded No = 0, Yes = 1) was associated with the blocking of social media sites. The results depicted in Table 6.15. There was no association between any of the school designations and blocking of social media sites (rs = -.06 to .03, p > .05).

Table 6.15: Associations Among School Designations and Blocking Social Media Sites.

	Internet Access	Disadvantaged	Special Needs	*Title 1*
Internet Access	--			
Disadvantaged	.03	--		
Special Needs	.02	.26**	--	
Title 1	-.01	-.06	.02	--
Any Designation	-.06	-.66**	-.53**	-.40**

Note: * p <.01, ** p< .01

6.3.12 Associations Between Online Technologies/ Activities Usage in the Classroom and Teaching Strategies of K-12 Teachers

To examine any associations between online technologies/ activities usage in the classroom and teaching strategies, a series of correlations was first performed, using the entire sample (n = 632) to determine if use of online technologies/ activities in the classroom affected teacher practices. Three of the four teacher practices had been

identified in the data as stable constructs; *Educators' Student-Centred Teaching Approach*, *Educators' Willingness to Receive Teaching Feedback from Students and Peers*, *Educators' style in facilitating students to take control of their own learning*. The results are presented in Table 6.16 and reveal that online technologies/ activities usage in the classroom was positively associated with student-centred teaching approach, willingness to receive teaching feedback from students and peers, and teaching style in facilitating students to take control of their own learning (*r*s .12 to .30, $p < .05$).

Table 6.16: Associations Among Online Technologies/ Activities (OTA) Usage in Classroom and Teaching Strategies.

	OTA Use	Student Centred	Teaching Feedback	Student Control
OTA Use	--			
Student-Centred	.12**	--		
Teaching Feedback	.17**	.51**	--	
Student Control	.30**	.47**	.52**	--

Note: * $p < .05$, ** $p < .01$

6.2.12.1 Associations Between Online Technologies/ Activities Usage in the Classroom and Teaching Strategies as a Function of Elementary, Middle and High School Level

To determine if the associations among online technologies/ activities usage in the classroom and teacher practices were different as a function of school level, a series of correlations were conducted separately for elementary school teachers (n = 283), middle school teachers (n = 97), and high school teachers (n = 215). These results are portrayed in tables 6.17a-6.17c. At the elementary school level, online technologies/ activities usage was positively associated with *educators' willingness to receive teaching feedback from students and peers* (r = .15, $p < .05$) *and student-centred*

teaching approach (r = .28, p< .01), but not *educator's style in facilitating students to take control of their own learning*.

Table 6.17a: Associations Among Online Technologies (OTS) Usage in the Classroom and Teaching Strategies for Elementary School Teachers (*n=283).*

	OTA Use	Student Centred	Teaching Feedback	Student Control
OTA Use	--			
Student-Centred	.11	--		
Teaching Feedback	.15*	.48**	--	
Student Control	.28**	.43**	.50**	--

Note: * p <.05, ** p< .01

Similar to early results, online technologies/ activities usage was more strongly associated with teaching practices for middle school teachers. In particular, the magnitude of the correlations among online technologies/ activities usage in the classroom and *educators' willingness to receive teaching feedback from students and peers* (r = .24, p< .05) and *educators' style in facilitating student to take control of their own learning* (r = .41, p< .01) were the largest among middle school teachers, when compared to elementary and high school teachers. Interestingly, online technologies/ activities usage was not associated with *educators' style in 'facilitating students to take control of their own learning* for middle school teachers. Finally, for high school teachers, online technologies/ activities usage in the classroom was positively associated with *student-centred teaching approach*, e*ducators' willingness to receive teaching feedback from students and teachers*, and *educators' style in facilitating students to take control of their own learning* with the correlations being larger in magnitude than those found among elementary school teachers (see Table 6.34).

Table 6.17b: Associations Among Online Technologies/ Activities (OTA) Usage in the Classroom and Teaching Strategies for Middle School Teachers (*n* = 97).

	OTA Use	Student	Teaching	Student Control

		Centred	Feedback	
OTA Use	--			
Student-Centred	.10	--		
Teaching Feedback	.24*	59**	--	
Student Control	.41**	.53**	.54**	--

Table 6.17c: Associations Among Online technologies/ activities (OTA) Usage in the Classroom and Teaching Strategies for High School Teachers (n = 215).

	OTA Use	Student Centred	Teaching Feedback	Student Control
OTA Use	--			
Student-Centred	.20**	--		
Teaching Feedback	.15*	.54**	--	
Student Control	.25**	.50**	.54**	--

6.3.13 Associations Between Online Technologies/ Activities Usage in the Classroom and Teaching Strategies (Among Teachers that Reported No Blocking of Social Media)

A series of bivariate correlations were performed to examine associations between online technologies/ activities usage in the classroom and the use of the three teaching strategies among teachers that reported no blocking of social media (n = 110). Similar to the results of the analysis performed with the entire sample, a positive association between online technologies/ activities usage in the classroom and *educators' willingness to receive teaching feedback from students and peers* was found (r = .32, p< .01) and *student-centred learning approach* (r = .23, p < .05). The magnitude of the

relation between online technologies/ activities usage in the classroom and *educators' willingness to receive teaching feedback from students and peers* was larger among these teachers, when compared to the entire sample, while the association between online technologies/ activities usage in the classroom and *student-centred teaching approach* was slightly smaller among this smaller sample. In contrast to the entire sample, there was no relationship between online technologies/ activities usage in the classroom and *educator style in facilitating students to take control of their own learning* as a function among these teachers (see Table 6.18).

Table 6.18: Associations Among Online Technologies/ Activities (OTA) Usage in the Classroom and Teaching Strategies (among teachers that reported no blocking of social media).

	OTA Use	Student Centred	Teaching Feedback	Student Control
OTA Use	--			
Student-Centred	.04	--		
Teaching Feedback	.31**	.43**	--	
Student Control	.23*	.38**	.47**	--

6.4 Micro Study – Data Analysis and Reporting

Based on the high incidence reporting of social media sites being blocked in K-12 schools, a micro study was undertaken with those educators (17%, *n*=110) who reported no blocking of social media in their schools. The following are the trends emergent from this micro study.

6.4.1 Associations Between Attitudes Towards Social Media Use in the Classroom and Teaching Strategies

A series of bivariate correlations were performed to examine the relation between attitudes toward social media and the use of the three teaching strategies among teachers that reported no blocking of social media. As displayed in Table 6.19, there was no association between attitudes toward social media and the use the three different

teaching strategies. This finding suggest that attitudes toward social media do not influence teachers use of different teaching strategies among teachers that have open access to social media sites.

Table 6.19: Associations Among Attitudes Toward Social Media and Teaching Strategies.

	Social Media Attitudes	Student Centred	Teaching Feedback	Student Control
Social Media Attitudes	--			
Student-Centred	.04	--		
Teaching Feedback	-.03	.43**	--	
Student Control	.13	.38**	.47**	--

Note: * p <.05, ** p< .01

6.4.2 Associations Between the Level of Internet Access and Online Technologies/ Activities Usage in the Classroom

A bivariate correlation between level of Internet access and online technologies/ activities usage in the classroom among teachers that reported no blocking of social media (n = 110) indicated there was a significant, positive association among the variables (r = .32, $p \leq .001$). This result indicated that when teachers do not have social media sites blocked, teachers with more Internet access are more likely to report using online technologies/ activities in the classroom more when compared to teachers with less Internet access and open access to social media sites. Interestingly, the magnitude of this effect is virtually the same (r = .34, p < .001) when examining the association between online technologies/ activities use and level of Internet access among the entire sample (N = 632).

6.4.3 Associations Between Online Technologies/ Activities Usage in the Classroom and Teacher Confidence with Social Media

Across the entire sample (N = 632), it was found that there was a significant, positive association (r = .40, p< .001) among online technologies/ activities usage in the classroom and teacher confidence with social media. The same analysis was performed to determine if this relationship also existed among teachers that did not have social media sites blocked at their school (n = 110). There was also a positive correlation (r = .31, p< .01) among the variables in this smaller sample; however, the magnitude of the relation was somewhat smaller among these teachers. This finding might suggest that when teachers have more access to social media, their confidence in using social media may not be as important in actually using social media in the classroom, when compared to teachers that have social media sites blocked.

6.4.4 Associations Between Attitudes Towards Social Media and Online Technologies/ Activities Usage in the Classroom

Across the entire sample (N = 632), a significant, positive association was found (r = .27, p < .001) among attitudes toward social media and online technologies/ activities usage in the classroom. The same analysis was performed to determine if this relation also existed among teachers that did not have social media sites blocked at their school (n = 110). There was also a positive correlation (r = .20, p< .05) among the variables in this smaller sample; however, the magnitude of the relation was somewhat smaller among these teachers. Similar to the analysis above, it is possible that this smaller relation among these variables suggests that when teachers have more access to social media, their attitudes toward social media are not as great a predictor of classroom usage of online technologies/ activities, when compared to teachers who have limited social media site access.

6.4.5 Association Between Gender and Online Technologies/ Activities Usage in the Classroom

Across the entire sample (N = 632) a small, positive association was found between gender (dummy coded Female = 0, Male = 1) and online technologies/ activities usage in the classroom, r = .18, p < .01 (see Table 9). This finding suggested that males were more likely than females to report using online technologies/ activities in the

classroom. The association between gender and usage of online technologies/ activities existed even though the entire sample is predominately female (86%, n = 545).

A follow-up correlation was conducted within this micro-study in order to determine if the same relation existed among the smaller set of teachers (n = 110) that did not have social media sites blocked at their school. Similar to the entire sample, this smaller sample was predominately female (81%, n = 89). The bivariate correlation between gender (dummy coded Female = 0, Male = 1) and social media use in the classroom was significant, r = .25, p< .01. Again, the finding indicated that males were more likely than females to report using online technologies/ activities in the classroom. The magnitude of the correlation is somewhat larger among this smaller sample, when compared to the entire sample, suggesting that differences in gender usage of online technologies/ activities is greater when teachers have more access to social media sites.

6.4.6 The Effect of Social Media Access on the Use of Online Technologies/ Activities in the Classroom

To determine if not having social media sites blocked (n = 110) had an impact on the use of online technologies/ activities in the classroom, an independent t-test was performed with Social Media Sites Not Blocked (Yes, No) as the independent variables and Online Technologies/ Activities Usage (Range 0 -72) as the dependent variable. There was a significant effect of Social Media Sites Not Being Blocked, t(631) = 2.00, p< .05, d = .23). The means are presented in Table 6.20. Contrary to what one might assume, teachers who did not have social media sites blocked actually reported significantly less use of online technologies/ activities in the classroom (*Mean* = 10.61, *SD* = 8.22) when compared to teachers that had some social media sites blocked (*Mean* = 12.79, *SD* = 10.80).

Table 6.20: Means and Standard Deviations of Online Technologies/ Activities (OTA) in the Classroom as a Function of Social Media Sites Not Being Blocked.

	OTA Use *Mean* (*SD*)
Social Media Blocked (n = 522)	12.79[a] (10.80)

Social Media Not Blocked (n = 110)	10.61[b] (8.22)

Note: Different superscripts are significant at $p < .05$; *SD* = Standard Deviation

6.4.7 The Effect of Social Media Access on Attitudes Toward Social Media

To determine if not having social media sites blocked (n = 110) had an impact on the attitudes toward social media, an independent *t*-test was performed with Social Media Sites Not Blocked (Yes, No) as the independent variable and attitudes toward social media (Range 5 -30) as the dependent variable. There was no effect of Social Media Sites Not Being Blocked, $t(631) < 1.0$, $p = .43$, $d = .08$). The means are presented in Table 6.21. As that table depicts, teachers with and without social media sites being blocked had similar attitudes toward social media, with both sets of teachers having moderately favorably attitudes towards social media.

Table 6.21: Means and Standard Deviations of Attitudes Toward Social Media Use as a Function of Social Media Sites Not Being Blocked.

	Social Media Use *Mean* (*SD*)
Social Media Blocked (n = 522)	18.00 (5.35)
Social Media Not Blocked (n = 110)	17.56 (5.18)

Note: Different superscripts are significant at $p < .05$; *SD* = Standard Deviation

6.4.8 The Effect of Social Media Access on Teacher Confidence with Social Media

To determine if not having social media sites blocked (n = 110) had an impact on teacher confidence with social media, an independent *t*-test was performed with Social Media Sites Not Blocked (Yes, No) as the independent variable and teacher confidence with social media (Range 9 -54) as the dependent variable. There was a significant effect of Social Media Sites Not Being Blocked, $t(631) = 2.17$, $p < .05$, $d = .23$). The means are presented in Table 6.22. Again, contrary to what one might assume, teachers with less access to social media reported having greater confidence in using social media (*Mean* = 35.17, *SD* = 10.30) than teachers with no social media sites blocked (*Mean* = 32.84 *SD* = 9.61).

Table 6.22: Means and Standard Deviations of Attitudes Toward Social Media Use as a Function of Social Media Sites Not Being Blocked.

	Social Media Use *Mean* (*SD*)
Social Media Blocked (*n* = 522)	35.17[a] (10.30)
Social Media Not Blocked (*n* = 110)	32.84[b] (9.61)

Note: Different superscripts are significant at $p < .05$; *SD* = Standard Deviation

6.5 Conclusions

This chapter presented various correlations conducted with the entire sample, and at each of the levels of elementary, middle and high schools; and in addition conducted correlations within a micro study of the 110 participants whose social media access was not blocked by their school. The correlations examined associations between: educator use of online technologies/ activities within their personal lives, professional development and classroom practice; gender, age; years of teaching experience; attitudes to and confidence in the use of social media for educational purposes; school level (elementary, middle and high school); school type (public private, charter); school designation (disadvantaged, special educational needs, *Title 1*); and teaching strategies employed by educators.

Strong positive correlations were found between K-12 educators' use of online technologies and social media in their personal lives, for professional development and within their classroom practice. The educator's age was found to be negatively correlated with use of online technologies/ activities in classroom practice, indicating that younger teachers were more likely to report using online technologies/ activities when compared to older teachers. Furthermore, there was a positive correlation between years of teaching experience and the use of online technologies/ activities in classroom practice, indicating that teachers with fewer years of teaching experience were more likely to report using online activities when compared to teachers with more years of teaching experience. In terms of gender, males were more likely than females to use online technologies/ activities in their personal lives, for professional development and within classroom practice.

Regarding access, teachers across public, private and charter schools reported approximately the same level of Internet access. In looking at school type, teachers in *Title 1* schools reported less Internet access than teachers in other designated schools, while teachers at private schools reported having more social media sites blocked when compared to either public or charter school teachers. In examining correlations between educators' teaching approaches and use of online activities in classroom practice, it was revealed that online technologies/ activities usage in the classroom was positively associated with strategies that promoted student-centred teaching approaches, where teachers facilitated students to take control of their own learning and were willing to receive teaching feedback from students and peers. The micro study revealed that when teachers do not have social media sites blocked, teachers with more Internet access are more likely to report using social media in the classroom; more when compared to teachers with less Internet access and open access to social media sites. In addition, teachers with less access to social media reported having greater confidence in using social media than teachers with no social media sites blocked.

Chapter 7 examines these findings from Phase 2 in more depth in the context of the over-arching research questions.

Chapter 7 Conclusions and Recommendations

7.1 Introduction

This mixed methods study set out to explore primary and second level teachers' online technologies usage in their personal lives and within their professional development, and then examined how their uses in the previous two domains impacted their use of technology in classroom practice. It also explored teachers' confidence in using new technologies and social media; their perceptions of; attitudes to; and concerns around integrating social media in their classroom practice. The quantitative and qualitative findings for both phases of this study have already been presented; phase 1 in chapter 4 and phase 2 in chapters five and six. This chapter presents the study's conclusions and recommendations.

7.2 Overview of Methodology and Overarching Research Question

A multiphase mixed methods approach was used in this research. Phase 1 (2007-2008), an *exploratory sequential design,* explored the key factors influencing Irish primary school teachers' engagement in online CPD, the barriers to teachers' engagement in online learning, and finally, if and how engaging in the online courses influenced teachers' integration of online technologies in their classroom practice. Phase 2 of the research (2011-2013), an explanatory sequential design, sought to understand the penetration and usage of online technologies in education, specifically exploring any correlations in the use of social media in the personal lives, professional development and/ or classroom practice of K-12 teachers in the United States. Interviews, a focus group and online surveys comprised the data collection tools across this study. The data analysis process included the statistical analysis of quantitative data, and thematic coding of qualitative data, at various stages in the research process.

7.3 Conclusions from Phase 1 of the Study

The findings from Phase 1 of this study suggest that Irish primary teachers' engagement in online CPD did positively impact on technology integration in classroom practice, indeed, over 75% of primary teachers said that participation in online CPD had influenced their integration of technology in the delivery of the curriculum. Examples of technology integration included using the Internet, e.g., *Google Search* to carry out research on topics of interest such as the Vikings, allowing students to e-mail essays, downloading educational software, and adaptive technologies for special educational needs students. In relation to the 75% of teachers who increased ICT integration in classroom practice, the benefits of online CPD included an enhanced knowledge of online resources, an increase in teacher confidence in using ICTs for curriculum delivery, and improved technology skills.

Overall, almost 83 percent of teachers reported 'some influence' of the online CPD programme on their classroom practice. Teachers reported being able to access more resources, use practical advice and ideas from other teachers and adopt new methodologies in their classrooms. Therefore, online CPD can be used as a vehicle for the infusion of technology in classroom practice, and furthermore, can potentially support the reflective practitioner by providing access to professional learning while teachers are teaching, and by fostering online communities of practice. [Interestingly, among those teachers who reported that online CPD had no influence on their teaching, the findings show that many of these were already using ICTs in their classrooms, or had attended programmes where ICT integration was not the focus.]

However, the findings from Phase 1 of this study also suggest that despite high satisfaction levels amongst users of online CPD, much improvement is required particularly in terms of collaborative and interactive elements of online CPD course design, in policy formation for the standardisation and recognition of online CPD programmes and in the degree of pedagogical challenge within online CPD programmes. Teachers were particularly unenthusiastic about some course design features including; navigational difficulties, unattractive layout and graphics, non-interactive course content (over-use of pdf documents resulting in illegible on-screen content requiring monotonous on-screen reading) and lack of diversity in assessment (consisting mainly of multiple-choice questions). Participants reported having to log on

for a minimum of 20 hours and having to post a specified number of posts. The lack of anonymity in the forums stifled more creative discussion and interactivity. These findings are a cause of concern. Online CPD courses must model good practice in aesthetic and pedagogic design, particularly as these online courses impact, not only on teachers' knowledge and skills within a particular thematic area or discipline, but importantly on teachers' dispositions towards the future integration of technology in classroom practice. Therefore, online CPD courses must promote meaningful engagement from a pedagogic perspective, while offering seamless navigation and interaction through the course, and opportunities for real collaboration with other practitioners.

Finally, the research in phase 1 suggests that the potential of online CPD is not being fully exploited due to particular situational, dispositional, institutional and technological barriers. The Situational Barriers identified in this phase included a lack of available time, and family commitments. The Dispositional barriers included teachers' perceptions of their ability to use technology lack of confidence with technology, lack of social interaction, fear of failure and low self-motivation. The Institutional barriers included; access to technology and the Internet, issues with quality of online content, fewer choices in the range of online programmes (when compared to range of face-to-face programmes), cost of online programmes and reduced recognition or inequality of EPV days award. Regarding technological barriers, low level of access to technology was seen as the greatest barrier along with technology skills and confidence using technology. The structure of the online CPD programme, its ease of use and navigation were stressed as important in counteracting some potential technological barriers. Technical support (and the knowledge that support would be close at hand) were regarded as important and seen as a major barrier if absent.

It is interesting to note that most of the factors influencing teachers' participation in online CPD programmes related to personal convenience and flexibility, rather than on pedagogic practice. Therefore, it could be concluded that teachers have adopted a rather egocentric view of online CPD (i.e., the benefits of online CPD centre on its flexible mode of delivery - how it facilitates personal convenience or can circumvent demands of family). This raises questions as to whether there is a need for a parallel process of conscious-raising among teachers of how the

global move towards online teaching and learning is impacting on the landscape of education, how their future role will involve harnessing online technologies to foster what Siemens (2007) has articulated within the Theory of Connectivism, and Learning eco-systems, and finally, how engagement with online CPD has the potential to transform classroom practice in this regard.

7.4 Conclusions from Phase 2 of the Study

The conclusions from phase 2 are presented here, leveraging the thematic framework that was introduced within the literature review process in chapter two, to articulate each dimension.

7.4.1 Access and Infrastructure in Online Technologies Integration

This study advances on the available research on 'access and infrastructure in online technologies integration' by offering new information about how school level, type of school, school designation and school policies impact on Internet access across K-12 education.

This study found that K-12 schools in general have a high degree of Internet access with 85% reporting having access to the Internet via desktop computer; this figure is slightly higher than Vockley Lang's (2009) US-based *Teachers Increasingly Value Media and Technology* report where 81% of teachers reported that they had access to the Internet in their classes. Other Internet connected devices available to teachers included laptops (54%), interactive whiteboards (51%) and tablet devices (26%).

Teachers from various designated schools (disadvantaged, special educational needs) tended to have the same level of Internet access, with the exception of *Title 1* schools, which appeared to have a lower level of Internet access, although *Title 1* teachers comprised a small sample (n=47), so generalisations may not be possible.

The majority of K-12 educators teach in schools where specific Internet and social media technologies are blocked in their classrooms, for example, SNSs such as

Facebook (75%), blogging sites, e.g. *Twitter*, (60%), instant messaging, e.g. *MSN* (58%), and Web-based communication, e.g. *Skype*, (42%). The results from the Analysis of Variance, ANOVA, did indicate that teachers at private schools (n=24) reported having more social media sites blocked when compared to either public school teachers (n=593) or charter school teachers (n=10). It is interesting to note that teachers at charter schools reported no blocking of social media sites. Furthermore, the school level had no effect on this outcome. Furthermore, there was no association between any of the school designations, such as *disadvantaged, special educational needs and other* and blocking of social media sites.

This association between the level of Internet access and social media use in classrooms indicated that when teachers do not have social media sites blocked, teachers with more Internet access are more likely to report using social media in the classroom more when compared to teachers with less Internet access and/ or less open access to social media sites. Interestingly, the magnitude of this effect is virtually the same (r = .34, p < .001) when examining the association between social media use and level of Internet access among the entire sample. McLeod (2012) provides advice to policy makers urging that education on safe use is more effective than blocking.

The effect of social media usage in the classroom where social media sites are not blocked (n = 110) was examined. Teachers who did not have social media sites blocked actually reported significantly less use of social media in the classroom (*Mean* = 10.61, *SD* = 8.22) when compared to teachers that had some social media sites blocked (*Mean* = 12.79, *SD* = 10.80). The *t-test* on the effect of social media access on attitudes toward social media showed that teachers with and without social media sites being blocked had similar attitudes toward social media, with both sets of teachers having moderately favourably attitudes towards social media. Regarding social media access and teacher confidence in using social media, teachers with less access to social media reported having greater confidence in using social media (*Mean* = 35.17, *SD* = 10.30) than teachers with no social media sites blocked (*Mean* = 32.84 *SD* = 9.61).

Therefore, the study has shown that while many K-12 educators had a good level of access to the Internet, they were restricted, mainly through school policy, on using some Internet sites and social media in classroom practice. In schools where social media usage was not blocked, higher levels of Internet access resulted in greater

use of social media in classroom practice. Interestingly, Fethi and Lowther (2010) state that access alone does not indicate technology integration, which has been corroborated in the low instance of Web 2.0 and social media integration in general across the K-12 sector in this study.

7.4.2 Trends in Types of Online Technologies/ Activities Being Used

The study has shown that the diversity of online technologies/ activities being used by teachers in their personal lives and for professional development is good, albeit at a low level. E-mail was, by far, the most frequently used online activity in respondents' personal lives (92%). Engagement in online activities linked to the use of social media was in general at a low level, with the exception of participation within social networking sites where over half use social networking sites such as *Facebook* or *LinkedIn* daily (53%) in their personal lives. The vast majority of educators did not engage in online activities for professional development, with the exception of e-mail, which was used daily by 42%, while 68% reported that they had never interacted with an online community of practice, or taken part in a discussion forum (56%). Of those who participated in professional development, 66% reported focusing on how to use specific classroom technologies, such as basic computer applications, how to participate in online communities of practice, Web publishing, Web video conferencing, 21st Century learners and technology integration in classroom and 13% reported spending personal time learning about ICTs.

The diversity of online activities used by K-12 teachers in their classroom practice is much greater. Three quarters of K-12 teachers say they use videos as Internet resources in the classroom on a daily/ weekly basis. This was by far the most used Internet resource in classrooms on a daily/ weekly basis (76%), corroborating the findings of Vockley Lang's 2009 study, where 78% of the cohort reported using videos. Learning games (65%) image or image collections (64%), interactive lessons (56%), current events information (49%), simulations (23%), blogs (20%), wikis (11%), and *Facebook*/ social media communities (8%) were also used by the current study's online survey respondents. Learning games were significantly more popular among educators at elementary (69%) and middle school (70%) than at high school (43%).

7.4.3 Trends in Models of Online Technologies Integration

This study showed that there was a strong correlation between online technologies/ activities use in the classroom and the three components of teaching style: *educators' student-centred teaching approach*, *educators' willingness to receive teaching feedback from students and peers* and *educators' style in facilitating students to take control of their own learning*. This association was stronger among educators whose access to social media wasn't blocked, when compared to the entire sample. This is a significant finding of the research because it posits that teachers' disposition or philosophical stance with regard to education (autonomous learning, democratic learning dispositions) and corresponding pedagogic strategies will impact on whether, and the extent to which, online activities will be integrated in the classroom.

The majority of the K-12 educators (76%) in this study taught to the whole class, while providing time in every class to support individualised instruction and promoting a diversity of modes of assessment. Over half (56%) collaborated with colleagues in the creation of learning resources for their discipline area. However, much lower percentages of respondents (10-28%) said that they invited other teachers to observe and critically review their teaching and learning approaches, requested student feedback on teaching, learning and assessment strategies, actively used resources that have been created by students, allowed students to democratically decide on how learning will take place or to choose the mode of assessment. Regarding the instructional methods encouraged by K-12 teachers, a majority strongly supported a collaborative approach where students discuss ideas with other students and the teacher, or work in groups; 60% allow students to reflect on their own learning, engage in inquiry or problem-solving based learning activities (53%), facilitate student self-assessment of their own work (51%), enable students to work alone at their own pace (44%). However, only about one third (36%) strongly encourage peer-assessment of work. Therefore, a participatory and democratic approach to learning whereby students elect assessments or become co-creators and/ or peer reviewers of resources, appears to be less popular among the K-12 educators in this study, and thus had a negative impact on use of social media in classroom practice.

Interestingly, associations across the three teaching strategies differed across school levels, with *facilitating students to take control of learning* not associated with online technologies/ activities usage at elementary and middle school levels, but

positively associated at high school level. With regard to this, further investigation is needed to uncover why high school teachers who facilitate autonomous learning are more likely to integrate online activities in their classroom practice, and why this makes less of a difference at elementary and middle school levels.

Regarding associations between the gender of K-12 educators, and their use of online technologies/ activities for personal, professional or classroom practice, the results of this study found that males were more likely than females to use online activities in their personal lives, for professional development and classroom practice. Furthermore, among those teachers whose access to social media was not blocked, the findings indicate that males were more likely than females to report using online activities in the classroom. The magnitude of the correlation is somewhat larger among this smaller sample (n=110), when compared to the entire sample, suggesting that differences in gender usage of online activities is greater when teachers have more access to social media sites. It should be noted here that although the number of males was low (n=35) in the overall population, that this association between the male gender and increased use of online activities has been shown to be statistically valid.

7.4.4 Key Influences on Teachers' Integration of Online Technologies/ Activities

This study found a number of key influences on teachers' integration of online technologies/ activities in classroom practice, namely, teachers' attitudes towards social media, teacher confidence in use of social media and teachers' age (and years of teaching experience). There is a positive correlation between teachers' attitudes, and teachers' levels of confidence, and their use of online activities in classroom, and perhaps unsurprisingly a negative correlation between teachers' age and years of experience and their integration of online activities in classroom practice; these results align with the findings of the European Commission (2013a) report on ICT usage in schools.

Associations between attitudes of teachers towards social media and online technologies/ activities use in the classroom across the entire sample (N = 632) yielded a positive association ($r = .27$, $p < .001$). There was also a positive correlation ($r = .20$, $p < .05$) among the variables in micro study; however, the magnitude of the relation was somewhat smaller among these teachers. Similar to the analysis above, it is

possible that this smaller relation among these variables suggests that when teachers have more access to social media, their attitudes toward social media are not as great a predictor of classroom usage of online technologies/ activities, when compared to teachers who have limited social media site access.

Regarding the associations between online technologies/ activities use in the classroom and teacher confidence with social media, this study found that there was a significant, positive association ($r = .40$, $p < .001$) among online technologies/ activities use in the classroom and teacher confidence with social media. The same analysis was performed to determine if this relationship also existed among teachers that did not have social media sites blocked at their school ($n = 110$). There was also a positive correlation ($r = .31$, $p < .01$) among the variables in this smaller sample; however, the magnitude of the relation was somewhat smaller among these teachers. This appears to suggest that when teachers have more access to social media, their confidence in using social media may not be as important in influencing their use of online technologies/ activities in the classroom, when compared to teachers that have social media sites blocked. These important clarifications extend the existing knowledge-base on the impact of teacher confidence in the utilisation of technologies in the classroom, such as Vockley Lang (2009), who found that providing support and training to teachers increases their confidence, Yaoyuneoyong and Burgess (2010), who found that confident teachers positively influence student confidence with technology, Hur and Hara (2007) who identified teacher confidence as a barrier to technology integration, and, the recent European Commission (2013a) study on ICT usage across EU, that found that teachers who are confident about using technology positively impact student learning, and use technology more frequently in class, even when ICT provision in low in their schools.

The study also showed that there was a significant, negative correlation among age (and also for years of teaching experience), and use of online technologies/ activities for personal, professional or classroom practice, indicating that younger, less experienced teachers were more likely to engage in online activities when compared to older teachers. This is hardly surprising given that age and years of teaching experience are highly correlated ($r = .66$, $p < .001$). Results were similar across the three school levels (elementary, middle and high school), with age (or years of experience) being

negatively correlated to online technologies/ activities use. The strongest relationships among age (or years of experience) and online technologies/ activities use (for all three domains of social media use) were evident among middle school teachers, suggesting a greater divide among teachers at this level with younger, less experienced teachers being considerably more likely to use online technologies/ activities than older teachers. In contrast, high school teachers had the weakest associations among age and online technologies/ activities use suggesting that there is less variability among high school teachers when it comes to their age (or years of experience) and their use of online technologies.

A significant, negative correlation was found among age and K-12 teachers' attitudes toward social media, indicated that younger teachers had more positive attitudes toward the use of social media than older teachers, with the exception of middle school teachers where there was no association among age and attitudes (although this sample was small in context of study). The correlation among K-12 teachers' years of teaching experience and their attitudes toward social media use for the entire sample suggest that the amount of years a teacher has been teaching or the level of school (elementary, middle, high school) has no relation to his/her attitudes toward social media.

7.4.5 Key Tensions that Impact on Teachers' Integration of Online Technologies

This study found that a large number of educators (circa 40%) felt that social media is a distraction to most students, and that they have insufficient time to integrate social media into their subject area. A much smaller minority (circa 11%) believed that using computers for learning takes student attention away from important instructional time, and furthermore that they felt out of place when confronted by technology and that the use of technology makes their professional work more difficult. The concerns highlighted above are indicative of some well-known tensions in education, namely: 'time demands of curriculum' versus 'innovation in learning' and 'digital natives' versus 'digital immigrants' debate (Bennett, Maton, and Kervin, 2008), and are discussed further in section 7.5.

7.4.6 Key Barriers to Teachers' Integration of Online Technologies

A significant barrier to the use of online technologies/ activities in K-12 schools identified within this study is the fact that access to social media is restricted in schools as reported by 79% of respondents. Other barriers included insufficient Internet bandwidth, insufficient numbers of computers, laptops or tablet devices for integration of social media, school computers not currently functioning (e.g. out of date or need repair), and insufficient technical support for teachers using social media in schools. A number of concerns specifically relating to the use of social media in schools included a perceived lack of privacy and security, the lack of control and the risk of students being exposed to inappropriate content or cyber bullying. There was also a fear that students would spend too much time on social media activities and that it would distract students in their classroom or negatively impact student learning. A large number of participants indicated that large class sizes were not conducive to integrating social media in classrooms (45%), and that too much time was required to effectively integrate social media in class (37%). Finally, 46% of respondents said that they would be unaware of how to use social media effectively for teaching and learning.

7.4.7 Claims Regarding the Potential of, or Need for, Integrating Online Technologies

It was evident from those teachers interviewed within this study that, teachers were aware of the rapidly changing landscape of technology in general and recognised the need for districts or schools to keep pace with this change. Teachers' perceived the integration of online technologies as providing better access to resources and ideas for teaching and learning, convenient access to professional networks of educators anywhere, the ability to give and receive ideas and advice, immediacy of responses to queries, and the efficient communication of information. Teachers also acknowledged the potential for student use of social media, citing; the ability to have students respond to non-fiction (political or environmental) topics in a social way, and to flexible mode of facilitating "*kids connecting with other kids*" around the world.

7.4.8 Standards in Online Technologies Integration

Standards in online technologies integration were not explicitly examined within this study. However, during the interview process in phase 2 of the research, teachers spoke about the likely impact of the 'common core' state standards (CCSS) on the integration

of online technologies/ activities in schools. The 'common core' state standards may impact on social media integration in schools specifically in relation to the development of school policies, which may include child safety or exploitation safeguards that limit social media access, as well as in the creation of disciplinary procedures for those who have been found to be engaged in unethical or inappropriate social media behaviour.

7.5 Discussion

In the discussion that ensues, the research questions that guided phase 2 of the research are examined with reference to the conclusions articulated in section 7.4, and where relevant, with reference to the literature reviewed in chapter two.

7.5.1 What Correlations Exist Between Teachers' Engagement in Online Technologies/ Activities Across their Personal Use, Professional Development and Classroom Practice?

The intent of the second phase of this research was to examine K-12 teachers' use of online technologies/ activities in general (alongside an inner focus on social media) in their personal lives, for their professional development, and in their classroom practice, and to see if there were any correlations between these three domains and online technologies usage. Cronbach's alpha test was used to validate the question scales and in the vast majority of cases, the scales used had *good internal consistency.* This research has contributed significantly to the body of research, as it is the first large-scale study which focuses on an analysis of online technologies usage within teachers' personal lives, professional development and classroom practice across the K-12 sector. So, what correlations have emerged from this study?

Across the entire sample (N=632), strong positive correlations were found between K-12 educators' personal use of online technologies and their subsequent use of online technologies/ activities for professional development and classroom practice. It is interesting to note that in examining these correlations at the three different school levels (elementary, middle and high school), slightly lower correlations between personal, professional and classroom use of online technologies were found at elementary school. Middle school appeared to have more significant correlations across

all three domains of personal use, professional development use and classroom practice. In high school the correlation was higher between personal use and professional development, and it was significantly lower between personal use and classroom practice. Finally e-mail formed a very significant percentage of teachers daily online activities across the three domains of personal (92%), professional development (42%) and classroom practice (79%). E-mail was also found to be more frequently used by teachers than SNSs, in Madden and Zickhur (2011) study. Trust (2012) acknowledges e-mail as the link between the teacher and the SNS. When 'e-mail' was removed from the correlational analysis within the study, the correlations between personal, professional and classroom use of online technologies were slighter stronger within the entire sample and at middle school level, and slightly weaker at high school level.

In terms of K-12 educators age (and years of experience) and use of online technologies/ activities across the three domains, significant negative correlations were discovered indicating that younger teachers are more likely to use social media than older teachers. Similar results were found across elementary, middle and high school educators, although middle school teachers were considerably more likely to use social media across the three domains of use and in the case of high school teachers, where the weakest correlations were found, demonstrating that age and social media use was more variable. The European Commission (2013a) study on ICT usage across EU27 also found this correlation among age (and years of teaching experience) and use of new technologies.

The study also found that male educators are more likely to use online technologies across all three domains. This pattern was found across all three school levels, with more significant correlations in elementary school (r = .24, p < .01) even where females comprised 97% of the sample. Results from the predominately female (81%, n =89) micro study (n=110) corroborated the findings above and in this sample males are even more likely to use social media (r = .25, p<.01)

A majority of educators reported having regular access to the Internet via computers (78%) and Mac/ PC laptops (54%) for teaching purposes. Further correlational analysis also indicated that there was no impact on Internet access across

school level (elementary, middle and high school), or school type (Public, Private, Charter), although a slight effect for *Title 1* schools. However, the majority of teachers are blocked from using specific social media in their classrooms such as social networking sites, e.g. *Facebook* (75%), only 17% had no restrictions which triggered the micro study's examination of educators whose schools did not block access to the Internet and social media sites. No significant differences in social media blockages were found at the different school levels (i.e. elementary, middle and high school), school type (public, private, charter) or school designation (disadvantaged, special educational needs, other). One further correlation conducted on the 'other' category indicated that the majority of these educators taught in *Title 1* schools, where a slight negative correlation did exist between *Title 1* designated schools and Internet access (r = -.10, p = .02). The European Commission (2013a) found similar results although the focus of this research was on ICT use in general not on the newer technologies of Web 2.0 and social media.

Regarding blocking of social media, in general, K-12 teachers with greater access to the Internet, i.e., no blocking of Internet or social media access, were more likely to report using social media in their classrooms (r = .34, p < .001). Overall results were practically the same as the micro study association (r = .32, $p \leq$. 001).

This study reveals significant findings about teacher attitude and social media across K-12 education, indicating teachers who use social media in their professional development and classroom practice have more positive attitudes towards social media. Younger teachers also have more positive attitudes towards the use of social media than older teachers (r = -.15, p< .001). These trends were similar across school type, although high school revealed a negative correlation between attitudes and age (r = -.16, p = .02). K-12 teachers' years of teaching experience had no association on their attitudes toward social media use, nor did school level, nor school type. Results from both the full sample and the micro study suggest that attitudes toward social media do not influence teachers use of different teaching strategies among teachers that have open access to social media sites. Overall, teachers with and without social media sites being blocked had similar attitudes toward social media, with both sets of teachers having moderately favorably attitudes towards social media.

Across the entire sample and the micro study, where social media is not blocked, a significant correlation was found between social media use in the classroom and teacher confidence with social media. This correlation was somewhat smaller among micro study teachers, suggesting that when teachers have more access to social media, their confidence in using social media may not be as important in actually using social media in the classroom, when compared to teachers that have social media sites blocked.

7.5.2 What Barriers Exist to Teachers' Use of Online Technologies?

The barriers to teachers' use of online technologies identified within phase 2 of this research can be summarised as a lack of access to, or technical support for online technologies such as social media, e-safety concerns, school policy restricting of blocking social media, teachers' dispositions towards online technologies and/ or inadequate level of training in the use of online technologies in education. These findings corroborate the many barriers to Web 2.0 use and social media discussed in the literature review. Access has been identified as a barrier by Buabeng-Andoh (2012). Technical support and teacher training is cited as a barrier to use of online technologies in classroom practice in many studies including European Commission (2013a), Picciano and Seaman (2008), Kopcha (2008). The European Commission (2013a) study further highlights insufficient ICT equipment as a barrier to use of technology in education. Yuen *et al.* (2011) cite teachers' dispositions towards online and social media technologies in relation to perceptions of usefulness and applicability as potential barriers to integration of technology, while Picciano and Seaman (2013) mention the lack of acceptance of legitimacy of online courses in relation to their adoptions on the part of institutions. Su (2009) refers to teachers' pedagogical and psychological beliefs as barriers to use. Yuen *et al*. (2011), BECTA (2008) and the European commission (2013a) also refer to eSafety concerns.

However, a significant finding from this research is that the majority of schools blocked or restricted the use of social media in classroom practice. The implications of this are profound – by limiting the usage of online technologies/ activities in the learning environment, the potential for harnessing online technologies (such as social media) to connect, communicate, create and collaborate is greatly reduced, and the learning experience may be diminished as a result. School policies that

block or severely restrict social media usage in the classroom are counterintuitive in the context of the global move towards online learning, that aims to prepare learners with 21st century skills for engagement within the knowledge economy and society.

Finally, teachers also mentioned the issue of the 'time demands of curriculum', and how this restricted opportunities for integration of online technologies in teaching and learning. The age-old issue of the demands of the curriculum curtailing innovation in learning can only be resolved through the development of a more enlightened understanding among teachers of the value of technology in facilitating transformative learning opportunities. This will necessitate revision of online CPD programmes, so that they not only train those teachers lacking key skills (*digital immigrants*) on how to use emerging technologies effectively in their practice, but also provide opportunities for teachers to dialogue on the value of integrating online technologies in education.

7.5.3 Has Engaging in Personal Use of Social Media Influenced the Likelihood of Teachers Using Social Media in Professional Development and/ or Classroom Practice? If so, How?

The overall integration of social media in personal, professional development and classroom practice was at a low level with the exception of social networking. The fact that in the majority of schools social media is blocked has a huge impact on the overall level of integration of social media in schools. However, this study clearly shows that where correlations exist, these are strong. Correlations were found between teachers' personal use of social media in their personal lives, their use of social media for professional development and their use of social media in their classroom practice, for the entire sample (N=632). In terms of school level, strong correlations were also found at the individual school levels (elementary school, middle school and high school). A slightly weaker correlation was found at elementary school between the three domains of use (personal use, professional development use and classroom practice use). High school had strong correlations, but the correlations for middle school teachers use across the three domains was significantly higher than elementary or high school.

7.6 Recommendations

The recommendations provided herein discuss possible areas of further research, policy recommendations for online technologies integration in education, and the revision of CPD programmes.

7.6.1 Areas for Further Research:

- A follow-up study that examines Irish teachers use of social media within their personal lives, for professional development and in classroom practice needs to be undertaken. The results could then be juxtaposed with the outcomes from phase 2 of this research.
- Within this study, middle school teachers appeared to yield stronger correlations between the usage of online technologies and the deployment of particular teaching strategies (student-centred learning, teachers' willingness to receive student and peer feedback and teachers facilitating students to take control of their own learning). However, the cohort of middle school teachers was the smallest of all three school levels and therefore a larger study involving educators at this school level would be required to validate these findings.
- Another interesting research project might look at why high school teachers seem to facilitate 'students taking control of learning' more than elementary and middle school teachers. Furthermore, more investigation is needed to uncover why high school teachers who facilitate autonomous learning are more likely to integrate social media in their classroom practice, and why this makes less of a difference at elementary and middle school levels.
- Finally, further investigation is needed into the philosophical dispositions of teachers and how this might impact on teachers' use of social media in the classroom.

7.6.2 Policies for Online Technologies Integration in Education

Districts and schools will need to relook at their policies of access and blocking in order to comply with the aforementioned CCSS. The adoption of appropriate and balanced school policy dealing with access to the Internet and social media technologies and appropriate use, as well as appropriate support for teachers in the form of technical support and professional development, will ultimately lead to the

essence and aspirations of 21st Century skills articulated within the CCSS. School policies that support better and more effective online technologies integration will move teachers and schools to a place of acceptance and more effective integration. The opportunity exists for schools to ensure that policies that govern the access and use of social media and new technologies are up to date and capable of dealing with current trends, concerns and potentialities, of social media in an educational context.

7.6.3 Revision of CPD Programmes

According to Yuen, Yaoyuneyong and Yuen (2011) and Sadag, Newby and Ertmer (2012), teachers' perceptions of the value of the integration of online technologies is key to their use. Teachers' perceptions of the pedagogical value of these technologies is a key challenge to their classroom integration. This research found that teachers' deployment of specific teaching strategies was aligned with increased usage of online technologies in their teaching. Therefore, the continuing professional development of teachers (including encouraging the use of communities of practice) is required to engender the teaching strategies and philosophical beliefs that will ultimately result in more effective models of integration of Web 2.0 and social media in education.

Online CPD course providers need to consider issues around poor access to technology and inadequate infrastructure noted in phase 1 of this study. As a minimum, course providers ought to be aware of the differing skills-level of their target audience, and provide appropriate support and training for those engaging in online CPD programmes. The collaborative aspect of online programmes is an area where improvements can be made by course developers. The constructivist philosophy of creating knowledge through collaboration should strongly underpin this aspect of online programmes. Teachers must be offered opportunities to leverage online technologies to communicate, collaborate and share their knowledge, experiences and good practices, and in doing so, become reflective practitioners, life-long learners and active members of communities of practice.

7.7 Conclusions

The potential of online technologies to transform teaching and learning has been highlighted by Kampylis, Bocconi, and Punie, (2012); Redecker, Ala-Mutka, and Punie

(2010); Ala-Muta, Punie, and Redecker (2008); Koptcha (2008); Johnson, Adams and Cummins (2012); Becker (2000); Holland and Judge (2013); Morgan (2012) and many others. There are many examples of good practice in the integration of online technologies in learning, e.g. flipped classroom, but according to Yuen, Yaoyuneyong and Yuen (2011); Punie *et al*. (2006); European Commission (2013a); and Morgan (2012), the potential of online technologies has yet to be fully leveraged by schools or the teaching profession. This multiphase mixed methods study endeavoured to gain a deeper understanding of teachers' personal, professional and classroom use of online technologies in Ireland and the US, and thus contribute to the body of knowledge on how to promote and effectively integrate online technologies in classroom practice. In doing so, this study has uncovered the nature and complexity of the relationships between teachers' personal, professional and classroom use of technology, within the confines of institutional policies and technological infrastructures.

The phase 1 findings confirm that despite high satisfaction levels amongst Irish teachers of online CPD, much improvement is required particularly in terms of collaborative and interactive elements of online CPD course design, in policy formation for the standardisation and recognition of online CPD programmes and in the degree of pedagogical challenge within online CPD programmes. Phase 1 research also suggests that online CPD does positively impact on teachers' use of ICTs in classroom practice, however, the potential for using online CPD as a vehicle for promoting the integration of technology in education is not being fully exploited due to the aforementioned issues. The phase 2 findings suggest that there is a 'transfer of practice' from teachers' use of online technologies and social media in their personal lives and within professional practice, to classroom practice. This suggests that more investigation is needed into ways in which "*living technologies*" can be harnessed within teacher professional development, particularly within the design of online CPD programmes, and classroom learning contexts. This study also showed that there was a strong positive correlation between online technologies/ activities use in the classroom and three components of teaching style: *educators' facilitating student-centred teaching*, *educators' willingness to receive teaching feedback from students and peers* and *educators' style in facilitating students to take control of their own learning*. This calls for renewed efforts within CPD programmes to promote more democratic, student-centred and autonomous approaches to teaching and learning.

The integration of online CPD in education explicitly offers teachers flexibility in accessing CPD, providing opportunities for increased interaction and collaboration with peers and access to a diversity of quality learning resources in a range of subject areas. Hooligan (2006, p. 564) states that the '*facilitation of the professional learning of teachers as 'cyber students' is a potential driver to enhance the quality, morale and public standing of teaching as a profession'*. More importantly, the deployment of online CPD has the potential to implicitly model good practice in how to effectively utilise and integrate technology into classroom practice. In this respect, the aesthetic and pedagogic design of online CPD courses is key to teachers' engagement in critical and reflective thinking on their own teaching and learning. Teachers' utilisation of technological features and resources to facilitate transformative and constructivist learning opportunities in the classroom could be examined. Furthermore, this process of engaging in online CPD allows teachers to develop their '*sensibilities to being an e-learner'*, in particular through becoming more responsive to processes of change and adaption aligned with the integration of new technologies. (Daly *et al*. 2007, p. 459) It presents opportunities for teachers to rediscover and re-frame the value and meaning of professional learning and pedagogic practice as well as raising their morale.

It is evident from the findings of this study that further research is needed in this area, particularly as online technologies were integrated at a relatively low level in the vast majority of classrooms. There is a need to examine ways in which online CPD can help support and extend the professional learning of teachers as they practice in 21st century classes and provide the appropriate ingredients for teachers and students to engage with social media for learning purposes. Further research is also needed to identify and facilitate understanding of the types of teaching and learning environments, the disciplinary contexts, the preferred learning modes, the nature of the online technologies being utilised and other contributory factors for improving the quality of online CPD and resultant classroom practice. These will be key to promoting the meaningful integration of online technologies and social media at primary and post-primary levels of education in the future.

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Appendix A

Social Media Technologies Classification, Adapted from Kaplan and Haenlein (2010)

Social Media Classification	Product	Product Description
Collaborative Content Creation (tools facilitating user generated content (UGC))	*Wikipedia* www.wikipedia.org	With over 30 million articles in 286 languages, wikipedia is a collaboratively edited, multilingual, free Internet encyclopaedia supported by the non-profit Wikipedia Foundation.
	PBWiki http://pbworks.com	PBworks (formerly PBwiki) is a commercial real-time collaborative editing (RTCE) system.
	Wikispaces http://www.wikispaces.com	Launched 2005, Wikispaces is a Free web hosting service for creating private wikis with advanced features for businesses, non-profits and educators. Wikispaces has also given away more than 100,000 premium wikis to K-12 educators. Since 2010 Wikispaces have cooperated with web 2.0 education platform Glogster EDU.
	Flickr http://www.flickr.com	Flickr is an image and video hosting website, web services suite, and online community that was created in 2004.The service is used by bloggers to host images that they embed in blogs and social media. Yahoo reported in June 2011 that Flickr had a total of 51 million registered members.
	YouTube http://www.youtube.com	YouTube is a video-sharing website, created in 2005, on which users can upload, view and share videos. Most of the content on YouTube has been uploaded by individuals, although media corporations including CBS, the BBC, Vevo, Hulu, and other organizations offer some of their material via the site, as part of the YouTube partnership program.
	Pinterest www.pinterest.com	A content sharing service that allows members to "pin" images, videos and other objects to their pinboard. Also includes standard social networking features.
	SlideShare www.slideshare.net	SlideShare is the world's largest community for sharing presentations. With 60 million monthly visitors and 130 million page views. Besides presentations, SlideShare also supports documents, PDFs, videos and webinars.
	Google Docs http://docs.google.com	Closely linked to apps in Google Drive, Google docs enables users to create, share and collaborate on the web with documents, spreadsheets and presentations.
	WikiHow http://www.wikihow.com	WikiHow is a web-based and wiki-based community, consisting of an extensive database of how-to guides. It has evolved to host over 150,000 articles, and in January 2012, had 35.5 million unique readers from over 200 countries or territories.
	Wikispaces http://www.wikispaces.com	Launched 2005, Wikispaces is a Free web hosting service for creating private wikis with advanced features for businesses, non-profits and educators. Wikispaces has also given away more than 100,000 premium wikis to K-12 educators. Since 2010

		Wikispaces have cooperated with web 2.0 education platform Glogster EDU.
	Glogster EDU http://edu.glogster.com	Glogster EDU is a global education platform for the creative expression of knowledge and skills in the classroom. Empowering educators and students with the technology to create GLOGS - online multimedia posters - with text, photos, videos, graphics, sounds, drawings, data attachments.
	Google Sites www.sites.google.com	Google Sites is a structured wiki and web page-creation tool offered by Google as part of the Google Apps Productivity suite.
	Zoho http://www.zoho.com/	Zoho.com offers a comprehensive suite of award-winning online business, productivity & collaboration applications with more than 7 Million users who work online with Zoho.
	Delicious https://delicious.com	Founded in 2003, Delicious (formerly del.icio.us) is a social bookmarking web service for storing, sharing and discovering web bookmarks. By the end of 2008, the service claimed more than 5.3 million users and 180 million unique bookmarked URLs.
	Diigo https://www.diigo.com	The name "Diigo" is an abbreviation for "Digest of Internet Information, Groups and Other stuff." It is a research and collaboration (knowledge-sharing) social content site.
Blogs (personal web pages allowing for interaction and comments from others)	***WordPress*** http://wordpress.com	WordPress is a free and open source blogging tool and content management system. WordPress is currently the most popular blogging system in use on the Web, powering over 60 million websites worldwide.
	Blogspot www.blogger.com	Blogger is Google's free tool for creating blogs.
	Twitter www.twitter.com	Twitter is an online social networking and microblogging service that enables users to send and read text-based messages of up to 140 characters, known as "tweets". Twitter was created in 2006 and it had over 500 million registered users as of 2012, generating over 340 million tweets daily and handling over 1.6 billion search queries per day
	Tumblr www.tumblr.com	Started in 2006, Tumblr is a microblogging platform and social networking website. The service allows users to post multimedia and other content to a short-form blog. As of May 2013, Tumblr hosted over 108 million blogs.
	Tencent QQ http://www.imqq.com	Founded in 1999, and popularly known as QQ, this instant messaging software service offers a variety of services, including online social games, music, shopping, microblogging, and group and voice chat. As of 20 March 2013, there are 798.2 million active QQ accounts, with a peak of 176.4 million simultaneous online QQ users
Content Communities (facilitate the sharing of media among users)	*Storify* https://storify.com	Launched in 2010, Storify is a social network service that lets users create stories or timelines using social media such as Twitter, Facebook and Instagram.
Social	*Facebook*	Founded in 2004 by Mark Zuckerberg and fellow

Networking Sites (allow users to connect by creating personal profiles, inviting "friends" to access these profiles, and send e-mails and instant messages to each other)	https://www.facebook.com	Harvard University students, Facebook allows users 13 years and older to register, post content and comments. As of September 2012, Facebook has over one billion active users.
	Instagram www.instagram.com	Online photo and video-sharing social networking service that enables users to take pictures and videos, apply digital filters and share them on social networking services such as Facebook, Twitter, Tumblr and Flickr. Over 100 million active users as of April 2012.
	Friendster www.friendster.com	Friendster is a social gaming site based in Kuala Lumpur, Malaysia. It was previously known as a social networking website, until 2004.
	MySpace http://www.myspace.com	MySpace is a social networking service with a strong music emphasis, launched in August 2003. Although its decline coincided with the rise of Facebook, MySpace had a significant influence in pop culture and music and created a gaming platform. MySpace began the trend of creating unique URLs for companies and artists.
	Ning www.ning.com	Ning is an online platform for people and organizations to create custom social networks, launched October 2005.
	Mighty Bell https://mightybell.com	A social platform for real-world experiences allowing creators to have a simple way to define and share with others an organized series of step-by-step, day-by-day actions grouped together around a specific goal or topic.
	Foursquare https://foursquare.com	Foursquare is a free app that helps users make the most of where they are, sharing and saving the places they visit. Founded in 2007, it has a community of over 30 million.
	LinkedIn https://www.linkedin.com	Launched in May, 2003, mainly used for professional networking. As of January 2013, LinkedIn reported more than 200 million users in more than 200 countries and territories.
Virtual Game Worlds (3-D worlds)	World of Warcraft http://us.battle.net/wow/en/	3-D (three-dimensional*) environment where users through their personalized avatars interact with each other as in real life* (e.g., World of Warcraft)
Virtual Social Worlds (allow users to live a virtual life)	***Second Life*** http://secondlife.com	Launched in 2003, Second Life is an online virtual world developed by Linden Lab. A number of free client programs, or Viewers, enable Second Life users to interact with each other through avatars and have a Second Life'

Appendix B

Phase 1 Research: Interview Questions

1) Teachers Interview Questions

2) INTO Representative Questions

3) NCTE Representative Questions

4) DES Inspectorate Representative Questions

1) Teachers' Interview Questions:

Teaching Experience Category: 0-4 years 5-15 years 15-30 years
School/ address/ school type (special/ mainstream):

1. What online course did you undertake during Summer 2007?
2. Were there any reasons why you decided /What attracted you to do an online course as opposed to a face-to-face summer course?
3. What were your expectations of the course?
4. Were these expectations met?
5. Were there elements of the course that you found difficult for any reason? If so, what were these?
6. With regard to the course design, was it easy to navigate? Was information readily available? What demands did the course place on you that you found difficult?
7. Was there a collaborative aspect to the course? How did you find this?
8. Was your overall experience of the online course positive one? Can you elaborate?
9. Has engaging in this online course affected / influenced your teaching/ your classroom practice? If so, how?
10. As a result of you taking this course, are you more likely to integrate ICTs in your curriculum delivery? If yes / no please give details.
11. Was there anything about the course that you thought could be improved for future teachers?
12. Would you take an online Summer course again in the future?
13. What is your impression of online courses in general?

2) INTO Interview Questions:

Name:
Job Title:

1. How many online courses were run by the INTO during the Summer of 2007?
2. When did the INTO first offer online summer courses for teachers?
3. What was the uptake on these courses?
4. What percentage/ number of overall courses run by the INTO did online courses represent?
5. How do you make your members aware of these courses?
6. What are the key considerations for the INTO with regard to delivering online courses?
7. Who is involved in the design process?
   Are there reasons why teachers choose to do an online course as opposed to a face-to-face summer course?
8. How do you work with other organizations in providing these courses? (NCTE, Department of Education and Science and private companies)
9. Has the overall feedback been positive? Specifically what are the positives cited by teachers?
10. If there are areas for improvement cited, in what areas would these lie?
11. Does the INTO work to standardize the experience, design or layout of online courses provides?
12. What are the requirements for gaining approval for INTO online Summer courses?
13. What factors might influence teachers' engagement in online summer courses?
14. What are the differences between online and face-to-face summer courses?
15. What barriers might exist in teachers engaging in online summer courses?
16. Have teachers commented on the collaborative nature or otherwise of your online courses?
17. Did you envisage an impact on the integration of e-learning in classroom practice? What was that vision?
18. As a result of taking an online course, are teachers more likely to integrate ICTs in their curriculum delivery? If yes / no please give details.
19. Does the INTO intend to increase the number or promote the development of online courses for CPD?

3) NCTE Interview Questions:

Name:
Job Title:

1. How many online courses were run by the NCTE during the past number of years?
2. When did the NCTE first offer online summer courses for teachers?
3. What was the uptake on these courses?
4. What are the key considerations for the NCTE with regard to delivering online courses?
5. Who is involved in the design process? Who is on the design team?
6. What is the length of time required to create an online course?
7. What is involved in terms of meetings and development?
8. Who attends the meetings – the full design team members?
9. Who drives the design? Is this person an educationalist or a technical team member?
10. What are the key considerations made from the aesthetic, and pedagogic perspectives?
11. What are the design implications around accessibility and usability?
12. Are there reasons why teachers choose to do an online course as opposed to a face-to-face summer course?
13. How do you work with other organizations in providing these courses? (INTO, Department of Education and Science and private companies)
14. Has the overall feedback from teachers been positive? Specifically what are the positives cited by teachers?
15. If there are areas for improvement cited, in what areas would these lie?
16. Does the NCTE work to standardize the experience, design or layout of online courses provided?
17. What are the requirements for gaining approval for NCTE online Summer courses?
18. What factors might influence teachers' engagement in online summer courses?
19. What are the differences between online and face-to-face summer courses?
20. What barriers might exist in teachers engaging in online summer courses?
21. Have teachers commented on the collaborative nature or otherwise of your online courses?
22. Did you envisage an impact on the integration of e-learning in classroom practice? What was that vision?
23. As a result of taking an online course, are teachers more likely to integrate ICTs in their curriculum delivery? If yes / no please give details.

4) DES Interview Questions:

Name:
Job Title:

1. When did online courses come on stream?
2. What are the key considerations for the Department of Education and Science with regard to delivering online courses?
3. Who is involved in the design process?
4. Are there reasons why teachers choose to do an online course as opposed to a face-to-face summer course?
5. How do you work with other organizations in providing these courses? (NCTE, INTO and private companies)
6. What is the view of the inspectorate towards online summer courses for teachers continuing professional development?
7. Does the Department of Education and Science work to standardize the experience, design or layout of online courses provided?
8. What are the requirements laid down by the Department of Education and Science for online Summer courses?
9. What factors might influence teachers' engagement in online summer courses?
10. What barriers might exist in teachers engaging in online summer courses?
11. Do you envisage an impact of CPD in classroom practice? What was that vision?
12. As a result of taking an online course, are teachers more likely to integrate ICTs in their curriculum delivery? If yes / no please give details.
13. Does the Department of Education and Science intend to increase the number or promote the development of online courses for CPD?
14. How important is the assessment of the learning outcomes?
15. How do you monitor quality in terms of the learning value???
16. Blended learning
17. What problems currently exist with the online courses in your opinion?
18. What improvements might you consider for future offerings of online courses?

Appendix C

Phase 1 Research: Interview Transcript Samples

Name: Teacher 1
Teaching Experience Category: 0-4 years
Class: 3rd Class
School type: Mainstream
Course Organiser: ICEP
Letter of consent: signed – agreed to full name being used in research

Notes	**What online course did you undertake during Summer 2007?** It was Early Childhood Studies
Convenience Travel – 24/7 access	**Were there any reasons why you decided? / What attracted you to do an online course as opposed to a face-to-face summer course?** I just thought that it was handier. I was traveling to Australia during the summer and the courses that I wanted to take did not tie in time-wise so I just thought this was handy as I could do it as part of my travels. I could stop off in different places and do it. So it was just for convenience really.
Provide some ideas and practical hints Refresher - Transition to a new position	**What were your expectations of the course?** Well I had been working in a Special School previous to here and a lot of the work I would have done would have been like teaching Junior or Senior Infants so I thought that it would give me some ideas and some hints and as well as that I was making the transition back into mainstream teaching, I thought that if I was to get a younger class, I thought I would brush up on some of the skills and with controlling a big class, discipline, procedures and things like that. I just thought that it would give me some ideas and some practical hints
Yes	**Were these expectations met?** They were yeah. Now, I thought that there was quite a bit of theory that was unnecessary but some parts of it were very practical suggestions and the setting up of the classroom and organizational aspects and I found that very helpful.
No – although some monotonous on-screen reading	**Were there elements of the course that you found difficult for any reason? If so, what were these?** Not really but I found some of it not very helpful. It wasn't particularly difficult but it was unnecessary and I found it kind of monotonous reading through it and I didn't think that it was very useful in the classroom. Some of it I thought that there's no need to be spending an hour on this. But saying that someone

	else might find it very useful.
Yes – good structure and layout, easy to navigate	**With regard to the course design, was it easy to navigate? Was information readily available?** Aha, I found that it was broken up very well into the different lessons and the different sections and it was very self-explanatory really. I found as well as that it was kind of handy cause I was doing it on the go and it was do you know with some courses that if I started it and left it, it would be very hard to get back into it but it was structured quite well cause you could do one lesson and finish that completely, do the test and have that out of the way, so that the next time you went to do the course again you could start again at the next lesson. It wasn't difficult to get back into it at all. Navigating from page to page was fine as well.
No, although the course could have been completed in less than the specified 20 hours Frustrating	**What demands did the course place on you that you found difficult?** Not really, no the only thing that I would say I found I don't know if that's relevant to this question but we had to log on for a minimum of 20 hours and you would have it done within far sooner than that and I would be quite a fast reader so I'd have read and then I'd have to stay on line for ages so I'd keep reading and re-reading and stuff and in the end up I had to leave it online and that kind of thing I felt that was a little bit unnecessary. But I suppose that's something they have to do to cover themselves as well.
Yes, enjoyed reading through other comments in the forum, lots of practical ideas from other teachers, one of the better sides of the course…	**Was there a collaborative aspect to the course? How did you find this?** Em, I can't actually remember. **Were there chat rooms…?** Oh sorry, there were yeah…I'm just trying to think, yeah, there were that you a forum I think that you had to log on and give your opinion and em yeah I forgot about that so eh, after each lesson you'd have to write up a diary entry not a diary entry but just your opinions and your thoughts and you would leave, it was required that you would leave a message in the forum but I found that good reading through others as well cause like I said the practical side of things em was the part I was most interested in and you would get really good practical ideas from other teachers who were teaching infant classes and the like so yeah that was probably one of the better sides of it.
Yes – convenience while travelling, good hints and practical ideas for the classroom	**Was your overall experience of the online course positive one? Can you elaborate?** Yeah it was, em, I found it was very convenient. I loved the fact that I could be in Singapore doing my course in Early Childhood Studies, it was very convenient, and as well as that very good

	help, very good hints and practical ideas for the classroom especially that I have been out of mainstream for 2 years and I was a bit daunted of the fact of coming back into it. **Were you in Special Education?** I was, I was teaching in a school for severe to profound learning difficulties so em and that was my first job so it was kind of strange coming back into mainstream so I found this just kind of reminded me of all the things we learned in college and just got me back on track again with just practical ideas and the organisational aspect of things so yeah I found it very practical.
Yes from an organisational point of view	**Has engaging in this online course affected / influenced your teaching/ your classroom practice? If so, how?** I'd say it has from the organizational point of view anyway. It has, because straight away in September I took ideas from that and implemented them straight away into the classroom. Em I suppose if I had a younger class, I have third class at the minute, if I have a younger class it would have affected my much more. The fact that I have a more middle of the road class, a lot of the ideas, you wouldn't really use, but certainly some aspects of it you would.
Yes, use the computer more in class, Internet browser for research purposes, e-mail for sending work back and forth to school	**As a result of you taking this course, are you more likely to integrate ICTs in your curriculum delivery? If yes / no please give details.** Yeah, I suppose I use the computer in the class quite a lot and I suppose apparently as I'm used to using the computer as a result of doing the course. But with the boys, I would always assign 2 Internet browsers, so if we're looking up, we change the jobs all the time, but if we're looking up a certain topic like Vikings or whatever, two go down and find out whatever they can and as well as that we're writing stories at the minute so the boys type them up at the minute and anyone who has a PC and wants to type them up at home can and they e-mail them. We have a class e-mail address so they e-mail their essays and things to me and we edit them online and stuff and so. So things like that I would use the computer quite a bit in the classroom.
Having to stay online for the 20 hours was annoying	**Was there anything about the course that you thought could be improved for future teachers?** Em, not really, no not really, I found the fact that you had to stay on line for 20 hours a bit annoying but I think that can't be helped cause if you were doing a course, it would be the same thing, you might feel that it could be wrapped up in a day instead of a week. And sometimes I was working out the lessons that I would spend 3 hours or 4 hours on each lesson so sometimes you would need the full time and you'd be getting really involved in it and other times, I know that's…just some bits I found really relevant and interesting I would have spent

	more time on and then other bits that I found a bit monotonous. I suppose that's part and package of everything really
Yes	**Would you take an online Summer course again in the future?** Oh yeah, yeah.
Has a positive experience of doing online courses	**What is your impression of online courses in general?** That particular course I found particularly interesting and when I worked in a special school, there were some things that were less formal but there would be some courses on dyslexia and autism and I would have completed bits and pieces of those not as formal as that. I wouldn't have got a Cert or anything for it but I would have done them through the school and I found them very useful as well. So generally, I have had very positive experiences with online courses. **Have you done many online courses?** The main one was probably the Early Childhood Studies, but the Principal in our old school would set up a media course for Autism and there were 4 teachers in the school so it would kind of be running in the office and we could go in and take what we wanted from it. So yeah I would have done bits of one on autism and bits and pieces of one on ADHD actually was the other.

Interview Questions:
Name: Teacher 6
Teaching Experience Category: 5-15 years
Class: Resource Teacher
School type: Mainstream
Course Organiser: INTO
Letter of consent: signed – agreed to full name being used in research

'Sharpening Minds not Pencils' – INTO	**What online course did you undertake during Summer 2007?** I did a maths online course provided by the INTO, I can't remember the actual name of the course but it was something like practical skills for teaching maths.
Transition to a new job – Learning Support Teacher for Maths Looking for a practical course, revision and consolidation reasons Practical choice to do it at home, save driving to attend a face-to-face course	**What were the reasons that you decided to take an online summer course? /What attracted you to do an online course as opposed to a face-to-face summer course?** Em, just a short time before that, I had taken up an offer of a job, part-time, job-sharing teaching maths in a primary school in Ballyfermot. I wanted to do something that would be practical that would provide a kind of revision and would consolidate a lot of the information that I had previously in relation to teaching maths and bring it all together so that I would have a resource that I could tap into, a sort of refresher. So before going back to teaching maths, it would give me a bit of motivation to become familiar again with the strands in maths and the different teaching approaches. **And then in terms of the online side of things, was there a particular reason why you decided to do this course online?** I think it was probably July when I had taken up this job offer and I hadn't a lot of choice. I suppose, I'm online a lot of time every day so I felt that it would be a practical choice and even with my own work routine from my office, I could dedicate a couple of hours a day where needed as against driving to an actual venue every day and attending a course that way.
To learn some practical skills	**What were your expectations of the course?** Em, I suppose it was more for the practical skills, the emphasis was to be on using concrete materials and psychology as opposed to the chalk and talk approach. So apart from that, I hadn't much expectation one way or the other, that's something that I wanted to do so I was clear in my own objective that I would enrol in the course do a few hours here and there and finish the course when I wanted to, go through the modules, the motivation was that in September I would be teaching maths so there was a goal in my own mind that sent me to do the course.
Yes and no Issue with the course being booked up and	**Were these expectations met?** Yes and no I think, I think that it's probably the first year that this particular course was done on line by the INTO and what actually surprised me initially was that because there's a practical course that

closed A lot of ideas in terms of working through the strands Useful links to web sites Audio-visual area needs to be improved Could do a lot more in terms of teaching methodology	many teachers would like to do, the course was booked up very quickly and they wouldn't take on any extra people to do the course. So, I made a number of phone calls to people in high places and got the course reopened and as a result, another hundred people signed up so I find that kind of ridiculous that the INTO weren't prepared to hire more facilitators. I think that there's a ratio of 25:1 or 50:1, so they expected a certain number of teachers to enrol in the course and hadn't put any contingency plan if the numbers exceeded that. You need x number of facilitators for x number of teachers. So I thought that was a bit strange. I wouldn't have been able to do the course had I not been able to wangle it and then they opened up all the other courses and consequently the INTO should provide me with a free course for the amount of extra money they made (laughs). So John Carr, if you ever get this transcript, I'll be expecting a phone call… But the course...there were a lot of ideas in terms of working through the strands, but a lot of it was done in the format of reading through different materials and different methodologies of teaching maths or teaching mental arithmetic and all that and different links to different web sites which I found useful for research because I think that teachers are becoming more savvy as regards finding online resources particularly there's a lot of freeware and shareware that is very good and there's an awful lot of resources out there for interactive whiteboards as well that you can download free of charge without having to create your own. I think that the course didn't challenge us in the sense that we were reading through the materials themselves and at each module you would be asked to give an opinion on a given point that was related to that module, be it problem-solving or mental arithmetic and asked to give a 3 or 4 sentence opinion which in terms of evaluating the course. I think that the whole audio-visual end of things could be, I think an awful lot more could be put into the course design in making it more relevant than reading through the various PDFs and games and whatever else. They were useful in that I printed off whatever I thought would be useful and I have them in a folder so when I am teaching maths part-time, I can refer to it for ideas for Bingo games or multiplication games. I also found useful the links to a lot of web sites with different freeware or shareware that had been checked out in advance. But in terms of teaching methodology, I don't know if they can provide us with…I'm not quite clear but I think that they could do a lot more with it.
Yes Reading through a lot of pages to assimilate information in the 1st week of July Too much	**Were there elements of the course that you found difficult for any reason? If so, what were these?** Yeah, I think that reading through a lot of pages and trying to assimilate it and make sense of it, especially if you're doing it in the first week of July when teachers are very tired and brain dead after a whole year's teaching, and I think that this is an other barrier because trying to motivate yourself in July when you won't be using it until the 1st of September. So you don't se it as very practical, but also a

content to read on screen E-mails saying details had not been provided correctly A more detailed valuation form would yield better feedback for the course organisers Motivator could be provided to get good feedback	lot of the online courses are too wordy, too much actual content thrown at you to read on screen. **Was there anything else that you found difficult about that particular course?** But even for me I thought that the end was a bit confusing because I got an e-mail saying that I hadn't given all my details correctly and that I wouldn't get my EVP days if I didn't respond before a given date and so I would have a higher IT knowledge than the average person but it wasn't very clear. So for people who don't have very good IT skills, it should be very simple whereby they put in their teacher's number, type the name of the course and then sign off on it, you know. I'm sure, I think that there was no clear evaluation at the end of the course; I think that there should have been more of a kind of questionnaire where they could give feedback on a particular course on what elements need to be improved. So I felt that that issue had almost been avoided, that they didn't want to get feedback. That's the sense I got, it was very flimsy, it's like if you do an actual course, I think that this feedback could provide motivation for teachers to give a proper evaluation, you'd be entered into a draw for a weekend away to a nice hotel in Co Mayo or some place, so that when they're working on a course again a pattern emerges in terms of what elements need to be improved with the course so it wouldn't be that difficult for them to go through that data then.
Yes, easy enough, no major problems in this area The forum requirements and comments were not very engaging	**With regard to the course design, was it easy to navigate? Was information readily available?** It was easy enough to work around, just click on different hyperlinks and work your way around, in that there weren't any major problems in regard to this. But the only evaluation at the end of each module was to give your opinion on a quotation and then people comment on your comment, which I thought in this day and age, is not very engaging.
No, except wading through the content to find useful information	**What demands did the course place on you that you found difficult?** No, just I suppose trying to wade through all the material or content and try to take out what was useful from it.
Yes, this area could be greatly improved allowing teachers to put forward methodologies and experiences Cold be a more natural forum for exchange of	**Was there a collaborative aspect to the course? How did you find this?** I think that could be taken further, teachers could be provided with an opportunity to give their own ideas as opposed to giving an opinion on problem solving. If that was taken a step further, a lot of teachers would be diligent enough to actually put forward their own actual methodologies, their own ideas or different games and activities that they have played and where they got their resources from or software they have used…I think that would be much more valuable than giving an opinion on a quotation, particularly when it's about a specific point in relation to mental arithmetic or shape or

ideas Would be good if the access to the course could be extended	measurement. It could be used as a natural forum where people could talk to teachers looking for ideas for teaching shape and colour that they could find ideas that other teachers have found that have worked for them. So it could be integrated so that it wouldn't be unavailable, so that if you wanted to use your name and password 3 months later, or it could be extended. I don't know if the course has to come off line but if it could be extended, then part of it left open through the web site that teacher could keep on updating it.
Yes, but a face-to-face course would have been a very different learning experience, more energy…	**Was your overall experience of the online course positive one? Can you elaborate?** Eh overall, yeah definitely, yeah. ***Do you want to elaborate on that?*** It suited me in the sense that it sort of gave me what I was looking for. I was only looking for a refresher, I wasn't looking for an in depth course and it did stimulate a few ideas. Some of the ideas form the course; I have used some I haven't so em for that it was useful for me to do it. I just wondered if I had done a course over 5 days in an actual room with an actual facilitator and a group of teachers, there would probably been a lot more energy and it probably would have been different so that learning experience could be different.
Yes, got practical ideas to use in the classroom	**Has engaging in this online course affected / influenced your teaching/ your classroom practice? If so, how?** Yes a little bit yeah. A lot of practical activities, dominoes games, card games. There were different little ingredients in different strands and kind of concrete games you could develop and play a number of games, domino games, bingo games, card games, things you can create yourself and you know software you could download yourself, so that was…
Yes, realises the value of good software	**As a result of you taking this course, are you more likely to integrate ICTs in your curriculum delivery? If yes / no please give details.** Yeah but I would integrate ICT into 25/30 percent of my teaching anyway because I do realise the value of very good quality as opposed to the traditional drill and practice software which has a place as well but should not dominate the wealth of software available. They can provide a teaching experience and even companies like Riverdeep provide software that does teaching lessons as well. I think that a lot of teachers see software as just reinforcement too. Whereas I would have a better understanding that modern programs can provide.
The look and design of the course The collaboration	**Was there anything about the course that you thought could be improved for future teachers?** Definitely the look and design of the course, more enticing graphics, layout. It's like looking at a dull web site, which you would flick off if very quickly and go on to the next one. They should use more

aspect EVP - disqualification	Flash and maybe use some basic video stuff, which could be collated from teachers who have been asked to demonstrate a maths lesson. Give teachers a chance to look at that and evaluate it. How would they do it differently? I think that the whole audio-visual thing was severely lacking in the course. Well the collaboration think where there could be more resources that they could share with each other. I think the evaluations. People getting actual course days, I think that that needs to be tightened up a lot because as the course stands at the moment, it is a course that could be done in one hour it a teacher wants to. Em so my understanding that will be provided this year whereby teachers actually had to put in the work in order to complete the course and a number of people either dropped out or failed the course which is a bit revealing of for what motivation teachers are actually doing the course. I think that in any professional body, be it teachers or solicitors or doctors, if they're going to be rewarded either by getting extra pay or time off as professionals you must realise that you have to put the work in and not get away easily.
Maybe, would need to grab attention	**Would you take an online Summer course again in the future?** M…yeah, maybe I might consider it, I'm not 100 percent sure, it would have to be something that would grab my attention and I think that it would have to be not doing a course for the sake of doing a course, it would have to be something that would be relevant.
They have a long way to go!	**What is your impression of online courses in general?** They have a long way to go! And if I ever design a course, I'll make sure that, there'll be lots of criticisms of it I'm sure, but it will contain elements, extra elements, ingredients, and make it more worthwhile.

Appendix D

Phase 1 Research: Focus Group Research Areas (Teachers Who Had Not Engaged in an Online Summer CPD Course)

Name:

Teaching Experience Category: 0-4 years 5-15 years 15-30 years

School/ address/ school type (special/ mainstream):

Areas for discussion

1. Perceptions/ feelings towards the use of technology in online education

2. Perceptions/ feelings towards the use of technology in continuing professional development (CPD)

3. Barriers to engaging CPD generally

4. Barriers specifically related to online CPD

5. Pros and cons of engaging in online CPD

Appendix E

Phase 1 Research: Focus Group Transcript

Teacher ID	*Areas for discussion*
	Perceptions/ feelings towards the use of technology in online education
Teacher 1	Well I mean I think it's very useful to use technology in the classroom if you have the resources for it. I think it's difficult if you, like many of the schools here, only have one computer in a class of 30. It's more useful in resource, which is what we're doing here where you have a small group or if you have a lab or laptops on wheels where you have one for each student, or a projector where you can project it up so they can all see. It's not as useful if you have to gather 30 kids around one computer and then they can't see…but I think it's great to use computers and there are lots of web sites out there that are terrific for you know maths and reading and science and you know the kids of course love doing online games and things like that rather than sheet work. It's always more exciting to see it on the computer and just using the Internet as a resource if you have to do research on different areas, research reports but like I said, I think it depends on what resources are available.
Teacher 2	Just following on from what Teacher 1 has said there, there's also some barriers with some teachers who have been trained you know quite some time ago, we weren't trained a) in the era of technology and b) the focus is on ourselves to retrain ourselves and there is slight a) a fear there, you know, I am not a very techie person, how do I do it and where do I go from here and if the resources aren't literally put in front of you, if you're not foisted into it, there is a slight reluctance (now some people have embraced it and done fantastic) but you know I personally am not a very techie person and there's only so far that I would go with technology even though, I can really see the benefits of it. But I was trained in a very different era, a very much talk and chalk era so I would have to be pulled into it, even though I would be interested in it but not interested enough to actually go and do you know…but yes

	I can see the advantages and I can see that that is where it is going to be going. So any teachers trained in the last 10 to 15 years are… and it's going to continue and it will only improve and accelerate.
Teacher 5	While I was training over in England nearly most of the classrooms would have had interactive whiteboards and so I had training. I could see such a difference and now coming back to Ireland and teaching here, but the benefits of having interactive whiteboards, if they're used properly, and the teachers are trained properly into using them properly. For the teacher and the kids. I used to use it for teaching maths, to introduce a maths lesson and to just get the kids up to the interactive whiteboard and they playing games and they love it like compared to doing stuff out of the textbooks all the time. If there's a balance and you know where to bring it into the classroom. I used to bring it into most lessons and there are some much resources on the Internet now that it's a great tool to have now, I think, personally. As well as that even to have x number of classrooms with all the computers that's the way it's going at the moment. That's the way it's going. I can see such a difference in the kids over in England. Their computer skills are much ahead of the Irish kids who can hardly type or they're using one finger and they don't know where each letter is on the keyboard.
Teacher 1	Yeah I have seen the same in the States, where they've been taken to the computer lab from Kindergarten, like since they were 5 years old. And they can type better than people who are our age.
Teacher 5	It is very important to have that to start off at an early age, to get that computer education because of jobs these days and all they need. It's all through computers, I'd say it's…
Teacher 4	I'm the Resource teacher here and I think that it lends itself well to kinds of the whole Learning Support/ Resource area, especially when you work with small groups or one to one and even back in class it can e used to differentiate work for children that would have special needs. I think that certainly from that point of view it really is a wonderful resource. And then as well as what Teacher 1 was saying about web sites, there's a huge amount of information available that we can access. And we would use it a huge amount within Resource throughout the school. I know it's a lot more difficult in class if you're

	just one teacher and a large group with one computer, but I think that it certainly is a wonderful resource to have and to use.
Teacher 3	So again I cam from a pre-digital age in regard to computers but certainly I can concur with everything that has been said, a great resource and I would embrace new technology. My main thing now is to up skill, up skill, you know I have a certain amount of skills on the computer, but you know at a very low threshold and the need for teachers, well some teachers, is to up skill personally and then that would I think help them in the classroom. Certainly, that's the way we're going into that age and I've no problem with it at all.
Teacher 4	There's confidence too. If you've got classrooms using a computer you're happier using it than in class where it's to improve your own skills as well.
	Perceptions/ feelings towards the use of technology in continuing professional development
Teacher 3	I think I'd still prefer the more traditional type of course, I think the idea of sitting at home there or sitting in your classroom and doing an online course it's very disembodying, very isolating, exactly. Whereas if you're put onto a course and I've done many Summer courses and that type of thing, you know you can meet up with a different group of people and there's a social interaction and all of that. And it makes the whole learning experience much more enjoyable and you get more out of it as well, I think.
Teacher 4	I'm just finishing a Master's at the moment with the OU and the reason I did it, it's half online, some of it would be online but what I like about it is the conferencing end of it, you're in touch with other people through the Internet that way, whereas I would se my tutor 3 or 4 times a year which I like, I like the face-to-face and I like the interaction with other people. But some of it is done in an online format and you can access other people around the world through online conferencing and that is very productive, that part of it. I wouldn't do an online; I'm not keen on online courses because of that because you don't meet up and you don't have that face-to-face which I think is very important in a course. So there are parts of it that work.

Teacher 3	That's not to say the benefits of online courses, a lot of people I know because of family or domestic circumstances cannot get out to courses or people in Ireland living in remote areas, for example. Definitely there are benefits to online courses but my own personal preference would be for a face-to-face course and the interaction and the interaction of ideas that that brings.
Teacher 4	That's part and parcel of it whether you are upskilling yourself you get so much from meeting with other people and networking and you know running things by them whereas you miss out on that in an online.
Teacher 1	I would just agree with what has been said. I think it's great for flexibility cause I, you know just doing my graduate course there would be some weeks where you had other commitments and you had to go to the course because you could get marched out if you weren't there, so I think that for flexibility, it's terrific, you can kind of plan your schedule around it, but I think that I would also miss the face-to-face and getting to talk with other people in the class to talk to the professor. I know that you do meet with the professor but I don't know it's like asking questions things like that.
Teacher 4	It's more supportive when you have a face-to-face in a group situation.
Teacher 2	But I think that in the world we live in and the way things are going, it's certainly going to be one of the main for the whole area, flexibility, time, etc. That is huge, people are now so busy you still want to upgrade your skills and this is an ideal way of doing it.
Teacher 5	I agree with what everyone has said there, I think the major thing is the flexibility and obviously, face-to-face you get more out of it if you do it the traditional way. I mean, I'd have no problems doing an online course and that, I think it has a lot to do with the confidence thing. To get around the whole program, the way it's set up. It might be frustrating for some people if it's not structured properly. To access certain information they might find it hard to do that. So as long as that's made very easy for like someone who's not confident in computers and that
Teacher 2	That's true cause a lot of people might be afraid to do it because they might think this is going to be so difficult, I'm no good and I think that that would be a big turn off for a lot of people.

Teacher 3	It's probably a cultural thing, you know in Ireland we like to talk face-to-face. I'm talking about business in general. You know if I have a complaint, my Insurance quote comes in…I remember leaving school one day and I can phone but no I'll go in. I went in, met somebody and he could see me; I could see him and I got 100 euro knocked off it, that's the way we do business. We'd be more confident and happier in those situations.
Teacher 4	…there is no face, there's no one to talk to…and that was so frustrating
	Barriers to engaging in CPD generally
All together	Time, it's time.
Teacher 2	I think that time is the main constraint in most people's lives no matter what their circumstances are. Also traffic, trying to get places getting back, I mean a course for me out in Tallaght, I wouldn't even attempt to do it no matter how interested I was in the course, I wouldn't even go there! Travel, time, to me they are the big barriers.
Teacher 4	I would be the same, my family is grown up now so I find that I am much more flexible with doing courses. I can if there's something coming up at nighttime or even over in Tallaght, I can work around it. But when my family was small there's no way I could have done that. You know when I was at Teacher 2's level the time is just not there and if you're working during the day and you have families or whatever, afterwards, it's impossible. I think that time is certainly a big factor.
Teacher 3	They would be the main reasons, domestic chores if you're caring for some one at home as well an ageing parent or whatever it can be another barrier if your parent is living down the country where you have to travel down at weekends, you know that can be a factor as well. And if you're traveling down the country regularly, say at weekends, well you know you're tired after work anyway and your weekend is now taken up as well.
Teacher 4	And travel as well, I think that we're lucky in Dublin in that we have a huge amount on our doorstep relatively

	speaking, but people living down the country in small villages, they'd have to travel a quite a distance to get… and they wouldn't have quite the same, em variety of courses that we would have here. Distance would be certainly one, distance and time.
Teacher 3	Which makes the case for online courses…!
	Barriers specifically related to online CPD
Teacher 4	I think too, again a lot of the online course are quite heavy on content and I think that if you're working hard during the year, like teachers, and you're doing a lot of head work, and I think it's nice to have something more practical, so I tend to do a practical based one where I'm out and about rather than sitting in a room taking in more information so whereas you wouldn't get that taking an online course.
Teacher 3	It's a good point you're making. Lads I know the course I'm just talking specifically about the summer courses the weeklong course. You know now that you mention it I've don things like set dancing and walks and tin whistle courses, stuff like that where you're getting away from it all. Getting it out of your head. I think none of those courses go to waste, you know, you will always find spin off that you will use in the classroom.
Teacher 4	And again I think, it's networking, you're coming up against other people. I go down every year; they know me well, to a hotel in Kerry. The Gaeltacht do an Irish one and you're out and about you're out at night time, you're out in the day, you're meting with people all the time and you're interacting with them and finding out how they're doing things in school and getting different ideas. It mightn't be anything about the Gaeilge, but you're coming up against people, you're just talking things through and you don't get that in an online course; that would be my feeling against it.
Teacher 2	Then there'd be the technical thing you know what Teacher 5 was saying earlier you know some people would have a fear of online, 'oh my God, I wouldn't have a clue!' while it might not be that difficult. You know that they would probably get through but there's this perception that 'Oh

	gosh that's for technical people, it's not for the likes of me' especially older teachers.
Teacher 1	I was just going to say eh, maybe like the motivation as well, if you're I don't know if you're out and you're interacting with people or the teacher or whoever is actually doing the course doing things, you're more motivated and it depends on what type of learner you are too. Actually participating in it might help, kind of sitting at a computer and reading, I know myself I might get bored after a while rather than actually doing things so depending on what type of learner you are that might hinder on it too.
Teacher 3	Yeah the other barrier is the one, I mean, I can't type very quickly; you have to be practical about it. It's a physical barrier and that's one of the things I have to do is a typing course, bring up my speed, you know, if there was an online course there that I was interested in or motivated to try out, the first thing
Teacher 4	So you've 2 things going on, you're trying to get your keyboard skills and trying to look at the content.
Teacher 1	And sometimes it's nice to know on this date and this time 'm doing the course, although I was saying earlier that this can be a problem but when you have to motivate yourself to get on the computer, start up and get yourself started, I might wait until the last minute to do it rather than ok if it's set for a certain date and time, I know it's done with anyhow, you know what I mean like so even though that also could be a problem at the same time.
Teacher 2	To me one of the big barriers is it's presupposing that everyone has technology in their homes. There would be people who don't have broadband, a computer, printer and all the rest of it, not everyone has that in their home. I still know people who don't have a computer. So if you don't have that you have no access to it.
Teacher 5	Just even connection problems which can get very frustrating when you're in the middle of doing something, the Internet dies, or even your computer or software problems can some people might be grabbing the computer and wanting to throw it out the window. And you could lose some of your work as well, you know, you could be in the middle of doing something and it just crashes and it's all gone. That has happened to me a few times, but I suppose it's part and parcel of the online course.

	Positives and negatives of using online CPD
	Positives
Teacher 2	The variety available
Teacher 2	The convenience of being able to do it from your own home (Teacher 2)
Teacher 3	Location- access in remote areas (Teacher 3)
	Negatives
Teacher 4	Isolation, I'd say isolation
Teacher 3	Difficulties with the technology, infrastructure
Teacher 2	Not as motivating
Teacher 3	Lack of broadband
Teacher 2	Lack of skills
Teacher 3	Out dated machinery
Teacher 5	Confidence with technology

Appendix F □Phase 1 Research - Online Survey Questions

The Professional Development Unit of the INTO is collaborating on research into on-line learning. If you participated in any on-line summer course last summer we would like you to complete and submit this questionnaire. We are interested in ascertaining your perceptions of on-line professional development especially with regard to on-line summer courses. This simple questionnaire is anonymous and will take only 10 - 15 mins to complete. It will support us in developing our on-line courses to better meet your needs.

1. Please indicate your teaching experience.

1-4years

5-15years

16-30years

2. Please indicate your school type.

Mainstream

Special

Other

3. Are you Male/ Female?

4. Indicate what on-line summer course you participated in.

5. Indicate the subject area of the on-line course you participated in.

6. Indicate why you participated in an on-line course last summer as opposed to a face-to-face course.

7. Apart from on-line summer courses please indicate what other types of professional development activities you have engaged in.

Face-to-face summer courses

On-line term time courses

Professional Development Seminars

In school courses

Other (please specify)

8. What were your prior expectations of the on-line summer course?

9. Were these expectations met?

Yes

To some extent

No

Please explain

10. Were there elements of the on-line course that you found difficult for any reason?

11. With regard to the on-line course design, was it easy to navigate?

Yes

No

Please explain

12. How would you rate the on-line course content?

Excellent

Very Good

Good

Average

Poor

Please Explain

13. What demands did the on-line course place on you that you found difficult?

14. Was there a collaborative/ forum aspect to the on-line course?

Yes

No

Describe your experience of this?

15. Was your overall experience of the on-line course a positive one?

Yes

No

Please explain

16. Has engaging in this online course affected / influenced your teaching/ your classroom practice?

Yes

To some extent

No

If so, how?

17. As a result of you taking this on-line course, are you more likely to integrate ICTs in your curriculum delivery?

Yes

To some extent

No

If so, how?

18. What suggestions would you make to improve on-line courses?

19. Would you take an on-line summer course again in the future?

Yes

No

20. What is your impression of online courses in general?

21. Please add any additional comments that you would like to make in relation to on-line courses.

22. Would you be interested in taking part in a follow-up interview/ focus group to discuss your experiences of on-line learning?

Yes

No

Thank you for taking the time to complete this questionnaire. Your responses are very much appreciated and will contribute to future developments in on-line course delivery.

If you answered yes to the above please indicate a contact e mail address

Appendix G Phase 1 Research - Online Survey, Summary of Results

On-line Summer Course Professional Development May 2008

1. Please indicate your teaching experience.

	Response Percent	Response Count
1-4 years	5.7%	4
5-15 years	22.9%	16
16-30 years	**71.4%**	50
answered question		**70**
skipped question		**0**

2. Please indicate your school type.

	Response Percent	Response Count
Mainstream	**97.1%**	68
Special	2.9%	2
Other	0.0%	0
Other (please specify)		2
answered question		**70**
skipped question		**0**

3. Are you

	Response Percent	Response Count
Male?	21.4%	15
Female?	**78.6%**	55
answered question		**70**
skipped question		**0**

4. Indicate what on-line summer course you participated in.	
	Response Count
	70
answered question	**70**
skipped question	**0**

5. Indicate the subject area of the on-line course you participated in.	
	Response Count
	70
answered question	**70**
skipped question	**0**

6. Indicate why you participated in an on-line course last summer as opposed to a face-to-face course.	
	Response Count
	70
answered question	**70**
skipped question	**0**

7. Apart from on-line summer courses please indicate what other types of professional development activities you have engaged in.

	Response Percent	Response Count
Face-to-face summer courses	**50.0%**	35
On-line term time courses	14.3%	10
Professional Development Seminars	15.7%	11
In school courses	20.0%	14
Other (please specify)		30
answered question		**70**
skipped question		**0**

8. What were your prior expectations of the on-line summer course?

	Response Count
	70
answered question	**70**
skipped question	**0**

9. Were these expectations met?

	Response Percent	Response Count
Yes	**70.0%**	49
To some extent	20.0%	14
No	10.0%	7
Please explain		49
answered question		**70**
skipped question		**0**

10. Were there elements of the on-line course that you found difficult for any reason?		
	Response Percent	Response Count
Yes	25.7%	18
No	**74.3%**	52
Please explain		25
answered question		**70**
skipped question		**0**

11. With regard to the on-line course design, was it easy to navigate?	
	Response Count
	70
answered question	**70**
skipped question	**0**

12. How would you rate the on-line course content?		
	Response Percent	Response Count
Excellent	**48.6%**	34
Very Good	37.1%	26
Good	7.1%	5
Average	2.9%	2
Poor	4.3%	3
Please Explain		46
answered question		**70**
skipped question		**0**

13. What demands did the on-line course place on you that you found difficult?	
	Response Count
	70
answered question	**70**
skipped question	**0**

14. Was there a collaborative/ forum aspect to the on-line course?		
	Response Percent	Response Count
Yes	**95.7%**	67
No	4.3%	3
Describe your experience of this?		60
answered question		**70**
skipped question		**0**

15. Was your overall experience of the on-line course a positive one?		
	Response Percent	Response Count
Yes	**80.0%**	56
To some extent	14.3%	10
No	5.7%	4
Please give details		43
answered question		**70**
skipped question		**0**

16. Has engaging in this online course affected / influenced your teaching/ your classroom practice?

	Response Percent	Response Count
Yes	48.6%	34
To some extent	34.3%	24
No	17.1%	12
If so, how?		52
answered question		70
skipped question		0

17. As a result of you taking this on-line course, are you more likely to integrate ICTs in your curriculum delivery?

	Response Percent	Response Count
Yes	45.7%	32
To some extent	30.0%	21
No	24.3%	17
Please give details		40
answered question		70
skipped question		0

18. What suggestions would you make to improve on-line courses?

	Response Count
	70
answered question	70
skipped question	0

19. Would you take an on-line summer course again in the future?		
	Response Percent	Response Count
Yes	97.1%	68
No	2.9%	2
Please give details		40
answered question		70
skipped question		0

20. What is your impression of online courses in general?	
	Response Count
	70
answered question	70
skipped question	0

21. Please add any additional comments that you would like to make in relation to on-line courses.	
	Response Count
	35
answered question	35
skipped question	35

22. Would you be interested in taking part in a follow-up interview/ focus group to discuss your experiences of on-line learning?		
	Response Percent	Response Count
Yes	27.9%	19
No	72.1%	49
If you answered yes to the above please indicate a contact e mail address		20
answered question		68
skipped question		2

Appendix H

Phase 2 Research: Online Survey Questions

DUBLIN CITY UNIVERSITY

Final Online Survey Questions

This online survey is part of a doctoral study entitled "The potential of online technologies and social media in 21st century teacher professional development and practice: A mixed methods study exploring connections between teachers' personal, professional development and classroom use of online technologies within Ireland and the United States of America".

Social media are web and mobile-based technologies that connect and facilitate interactive communication among individuals, communities and organisations, while also allowing for the creation and exchange of *user-generated* content. Some examples of social media include Facebook (social networking site) and Twitter (micro-blogging tool). This study aims to explore teachers' perceptions, attitudes, and experience of the integration of social media in their personal lives, their classroom practice and their professional development.

Your participation in this study is voluntary. Answering this questionnaire should require no more than 15-20 minutes. Most questions may be answered by simply clicking in the appropriate box. All responses are anonymous and treated in the strictest confidence; you will not be identifiable in any reports of the research. If you require further information, please contact Teresa Hagan via email: Teresa.hagan@hmhco.com
Please tick the box to confirm that you agree to participate in this survey.

I agree to participate in this survey. [ ]

Thank you very much for responding to this questionnaire.

A. Background Information:

1. Location: Where do you currently reside?
Tick one box

a. United States
b. Ireland

2. [IF Q1=US] In which state is your school located?
Include a drop list of US states plus District of Colombia (DC)

3. Which of the following best describes your job title?
Tick one box

- Classroom Teacher
- Department Chair/Director
- Head Teacher/Team Leader/Supervisor
- Curriculum Specialist/Coordinator/Director
- Curriculum Coach
- Principal
- Assistant Principal
- Superintendent/Assistant Superintendent
- Administrator
- Other (please specify)

4. Which grade(s) are you primarily responsible for?
Select all that apply

USA	***Ireland***
Pre K/K Grades	Primary Junior Infants
1st Grade	Primary Senior Infants
2nd Grade	Primary 1st Class
3rd Grade	Primary 2nd Class
4th Grade	Primary 3rd Class
5th Grade	Primary 4th Class
6th Grade	Primary 5th Class
7th Grade	Primary 6th Class
8th Grade	Second Level 1st Year
9th Grade	Second Level 2nd Year
10th Grade	Second Level 3rd Year Junior Cert.
11th Grade	Second Level Transition Year
12th Grade	Second Level 5th Year
	Second Level 6th Year Leaving Cert.

5. Which of the following subjects are you responsible for?

Select all that apply

- Literature
- English/Language Arts
- Reading
- Irish (Gaeilge)
- Math(s)
- Science
- Social Studies (History, Geography, Civics)
- World Languages/Foreign Languages
- Arts Education Visual Arts, Drama, Music
- English as a Second Language (ESL)/English for Speakers of other Languages (ESOL)
- Other (please specify)

6. Which of the following best describes your school type?

Tick one box

- Elementary School [Show if Q1=US]
- Middle School [Show if Q1=US]
- High School [Show if Q1=US]
- Primary School [Show if Q1=Ireland]
- Second Level School [Show if Q1=Ireland]
- Other, please explain: [Show to all]

B. Access to ICT/ Social Media in Education:

7. Do you have access to each of the following for teaching purposes?

Tick one box on each line (No, Sometimes – access to this on request (e.g. shared resources or via a mobile cart), Yes – permanent access to this (e.g. in my classroom)

- Desktop Computer with Internet connectivity
- Desktop Computer without Internet connectivity
- Laptop (Mac/PC) with Internet connectivity
- Laptop (Mac/PC) without Internet connectivity
- Interactive Whiteboard
- Tablet device (for example: iPad) with Internet connectivity
- Tablet device (for example: iPad) without Internet connectivity
- Mobile device (cell phone) for use in school

- Digital Camera/Camcorder
- Dedicated Computer room

8. Which of the following has your school provided you with for use in the classroom?

Select all that apply

- Laptop
- Tablet device
- None of these

9. Which of the following has your school provided each student for classroom use?

Select all that apply

- Laptop
- Tablet device
- None of these

10. Which of the following personally owned devices are students allowed to use for instructional usage?

Select all that apply

- Laptop
- Tablet device
- Mobile/Smart Phone/Cell Phone
- None of these

11. Does your school block the use of any of the following social media in the classroom?

Select all that apply

- Social networking sites (such as Facebook)
- Blogging sites (such as Twitter)
- Web-based communication (such as Skype)
- Instant Messaging (such as MSN)
- Other, please explain:
- None of the above

12. What Internet resources do you access / use in your classroom?

Select all that apply

- Lesson Plans
- Videos
- Images/ image collections

- Interactive Lessons
- Simulations
- Learning Games
- Current Events information
- Information for your own professional development
- Blogs
- Facebook, Wiki, Social media communities
- None of these

C. Personal, Professional Development, and Classroom Practice use of social media

13(a). Please indicate how frequently you have participated in these activities within your personal life in the past 12 months.

Tick one box for each item (never, daily, weekly, monthly, a few times per year)

Personal use	***Never***	***Daily***	***Weekly***	***Monthly***	***A few times per year***
E-mail					
Discussion Forums					
Real-time chat (such as instant messaging)					
Video Conference (such as Skype)					
Create Wikis (Such as Wikipedia)					
Blogging					
Social Networking (such as Facebook or LinkedIn)					
Follow or contribute to Microblogs (such as Twitter)					
Share images online (e.g., via Flickr)					
Share videos online (e.g., via YouTube)					
Individually create online documents (e.g., using Googledocs)					
Collaboratively create online documents (e.g., using Googledocs)					
Create Web sites					
Create online presentations (e.g., using Prezi)					
Interact in an online classroom (e.g., Wimba or OpenMeeting)					
Interact within a virtual Learning Management System (such as Moodle, Blackboard, Web CT)					
Interact with an online Community of Practice					
Virtual World (e.g. Second Life)					

13(b). Please indicate how frequently you have participated in these activities within your professional development in the past 12 months.

Tick one box for each item (never, daily, weekly, monthly, a few times per year)

Professional Development Use	***Never***	***Daily***	***Weekly***	***Monthly***	***A few times per year***
E-mail					
Discussion Forums					
Real-time chat (such as instant messaging)					
Video Conference (such as Skype)					
Create Wikis (Such as Wikipedia)					
Blogging					
Social Networking (such as Facebook or LinkedIn)					
Follow or contribute to Microblogs (such as Twitter)					
Share images online (e.g., via Flickr)					
Share videos online (e.g., via YouTube)					
Individually create online documents (e.g., using Googledocs)					
Collaboratively create online documents (e.g., using Googledocs)					
Create Web sites					
Create online presentations (e.g., using Prezi)					
Interact in an online classroom (e.g., Wimba or OpenMeeting)					
Interact within a virtual Learning Management System (such as Moodle, Blackboard, Web CT)					
Interact with an online Community of Practice					
Virtual World (e.g. Second Life)					

13(c). Please indicate how frequently you have participated in these activities within your classroom practice in the past 12 months.

Tick one box for each item (never, daily, weekly, monthly, a few times per year)

Classroom Practice use	***Never***	***Daily***	***Weekly***	***Monthly***	***A few times per year***
E-mail					
Discussion Forums					
Real-time chat (such as instant messaging)					
Video Conference (such as Skype)					
Create Wikis (Such as Wikipedia)					
Blogging					
Social Networking (such as Facebook or LinkedIn)					
Follow or contribute to Microblogs (such as Twitter)					
Share images online (e.g., via Flickr)					
Share videos online (e.g., via YouTube)					
Individually create online documents (e.g., using Googledocs)					
Collaboratively create online documents (e.g., using Googledocs)					
Create Web sites					
Create online presentations (e.g., using Prezi)					
Interact in an online classroom (e.g., Wimba or OpenMeeting)					
Interact within a virtual Learning Management System (such as Moodle, Blackboard, Web CT)					
Interact with an online Community of Practice					
Virtual World (e.g. Second Life)					

14. In the past 2 school years, have you participated in professional development in the following areas?

Select all that apply

- Basic computer applications (e.g. Internet browsing and searching, basic word processing, spreadsheets, presentations, databases, etc.)
- How to create a virtual course (e.g. using systems such as Blackboard or Moodle)
- Web publishing (e.g. creating websites, etc.)
- Web/videoconferencing
- How to use specific classroom technologies (e.g. Interactive Whiteboard, Camcorders etc)
- Pedagogical use of ICT in teaching and learning (e.g. Intel *Teach to the Future*)
- How to participate in online communities for teachers (e.g. mailing lists, social networks, twitter, blogs)
- E-tutoring
- Personal learning about ICT in your own time
- Other professional development undertaken related to classroom technology (please specify):
- None of the above

15. In total, how much time have you spent in these professional development opportunities during the past two school years?

Tick one box

- Less than 1 day
- 1-3 days
- 4-6 days
- More than 6 days

16. Please indicate how much you agree or disagree with the following statements. [RANDOMIZE]
(Scale of 1 to 6, where 1= Strongly disagree and 6=Strongly agree)

Tick one box for each line item

On a daily basis, I:

- Present, demonstrate and explain to the whole class
- Allocate time in each class to supporting individual students
- Collaborate with colleagues in the creation of learning resources for my subject/discipline
- Actively use resources that have been created by students
- Ask students to provide feedback on my teaching, learning and assessment strategies

- Allow students to democratically decide on how the learning will take place
- Invite other teachers to observe and critically review my teaching and learning approaches

16a. Please indicate how much you agree or disagree with the following statements
(Scale of 1 to 6, where 1=Strongly disagree and 5=Strongly agree)
[RANDOMIZE]

On a daily basis, I encourage students to:

- Work alone at their own pace
- Work in pairs or groups
- Engage in enquiry or problem-based learning activities
- Suggest alternative teaching, learning, or assessment strategies
- Discuss ideas with other students and the teacher
- Allow students to choose which topics to learn
- Reflect on their own learning
- Engage in peer-assessment of work
- Self-assess their own work

D. Teacher opinions and attitudes to the integration of social media in education

17. The following are concerns that some educators have when using social media in their classrooms. Please indicate how much you agree or disagree with each statement when thinking about using social media in your classroom.
(Scale of 1 to 6, where 1=Strongly disagree and 6=Strongly agree)
[RANDOMIZE]

Tick one box on each line.

- There is a lack of privacy/security when using social media.
- Social media will distract my students in the classroom.
- There is a lack of control on social media in my school.
- Students will spend too much time on social networking websites, such as Facebook.
- Too much time is required to effectively integrate social media in my classroom practice.
- The integration of social media will negatively impact learning.
- My students will be exposed to cyber bullying.
- My students will be exposed to inappropriate online content
- Access to social media is restricted in my school.

- There are insufficient numbers of computers/laptops/tablets for integration of social media.
- There is insufficient Internet bandwidth/speed for integration of social media at my school.
- School computers are not currently functioning (e.g., out of date or need repair).
- There is insufficient technical support for teachers using social media in my school.
- I am unaware of how to use social media effectively for learning in my subject/discipline.
- Large class sizes are not conducive to the integration of social media in my classroom.

18. Please indicate how much you agree or disagree with each of the following statements on the use of technology/social media in education. (Scale of 1 to 6, where 1=Strongly disagree and 6 = Strongly agree) [RANDOMIZE]

Tick one box on each line.

- I am confident using social media as a teaching tool.
- I feel out of place when confronted with technology.
- There is not enough time to integrate social media into my subjects/disciplines.
- I do not believe that quality of learning is improved by the use of social media.
- The use of technology makes my professional work more difficult.
- Using computers for learning takes students' attention away from important instructional time.
- I believe that the use of social media increases students' motivation.
- I believe that the use of social media positively impacts student higher order thinking skills.
- Social media should be used as a means to connect with students beyond the classroom.
- Social media can better facilitate sharing of experiences, ideas and advice among professionals/peers.
- Social media allows teachers to access online content more easily.
- Social media is a distraction for most students.
- Students try harder when they are learning with technology.

19. How confident are you with each of the following? (Scale of 1 to 6, where 1=Not at all confident and 6=Very confident) [RANDOMIZE]

Tick one box for each line.

- Producing/editing online documents (e.g. using Googledocs)
- Communicating with others using email or instant messaging
- Communicating with others using social networking tools, such as Facebook

- Communicating online using web conferencing tools, such as Skype
- Creating online courses (e.g., using Blackboard or Moodle)
- Capturing, editing and sharing digital photos or graphics online (e.g., via Flickr)
- Capturing, editing and sharing digital movies online (e.g., via YouTube)
- Collaborating in online communities of practice for teachers
- Delivering a course to learners online (e.g., e-tutoring)

E. Additional Areas

The last few questions are for classification purposes only:

20. Are you?
Tick one box

- Female
- Male

21. What is your age?
Tick one box

- Younger than 25 years
- 25 to 35 years
- 35 to 44 years
- 45 to 54 years
- 55 to 64 years
- 65 years or older
- Prefer not to answer

22. For how many years have you been teaching in the education field overall?
Tick one box

- Less than 1 year
- 1-3 years
- 4-10 years
- 11-20 years
- 21-30 years
- 31-40 years
- More than 40 years

23. In what type of area is your school located?

Tick one box

- o A village or rural area (population fewer than 3,000)
- o A small town (population 3,000 to about 14,999)
- o A town (population 15,000 to about 99,999)
- o A city (population 100,000 to about 999,999)
- o A large city (population of 1,000,000 or more)

25. Which of the following best describes your school?

- Public (non-Charter) [Show if Q1=US]
- Private (Parochial/Independent) [Show if Q1=US]
- Charter [Show if Q1=US]
- Public/State run school [Show if Q1=Ireland]
- Private School [Show if Q1=Ireland]
- Educate Together [Show if Q1=Ireland]

Other (please specify)

26. Please indicate whether your school has been designated as any of the following:

Select all that apply

- Special Needs schools/Special Education centres
- Disadvantaged schools/Academies
- Other, please explain:
- None of these

27. Sometimes, we may have questions about your responses to the survey. If so, we would like to follow up with a brief 15-minute phone interview to discuss your responses. If you are willing to engage in a short interview, please enter the following information below:

- o Name
- o Phone number
- o Email address

Thank you for your time!

Appendix I

Phase 2 Online Survey Summary Report and School Level Detail (Elementary, Middle and High School)

Appendix J

Phase 2 Research: Follow up Interviews (with teachers who reported Internet / social media sites not blocked in their schools)

Teacher Code:
Grade taught

1. Personal Life (online technologies and social media use)
Do you use social media in your personal/ home life?
What social media do you use?
If yes, how do you use it?

2. **Professional Development** ***(online technologies/ social media use)***
Have you used SM for your professional development?
Are you a member of a community of practice? Have you collaborated in CoPs?
What social media resources do you use?
How do you use them?

3. **In the Classroom (online technologies and social media use)**
Do you use social media in your classroom?
What social media resources do you use?
How do you use them?
(Detail on the type of video/ YouTube, length/ duration of the resource, (3-5 minutes), type of images, what Web sites? Do you access open resources, what kind of learning games.

4. **General Use**
Are you more inclined to use social media at home, for professional development of for classroom use?
What do you see as the real benefits of social media in education?
Do you have any concerns in relation to use of social media for education purposes?

5. **School Policy**
Does your school have a policy on access to technology (Infrastructure, specific technologies, mobile phones, etc.), specifically on social media access and use? Detail?

6. **Federal/ State Policy**
Does government policy, e.g. NCLB impact on funding/ access to Internet and social media technologies?

7. **Additional Comments?**

Appendix K

Phase 2 Research: Follow Up Interview Transcripts (Sample)

Name:	*EI8*
Grade(s) taught:	*I teach Kindergarten in an elementary school*
1. Personal Life Do you use social media in your personal/ home life? What social media do you use? How do you use it?	*Oh yes!* *I use Facebook – a lot and just connecting with friends and getting new ideas. I use Pinterest a lot to get new ideas for the classroom and just new ideas for social too. I guess I use it for both things, both personal and school life. Oh yes, I use it for music and for videotaping. I use it for both sometimes when I'm looking for something personal, I find something for school and it's like 'heh wait a minute I could use that type of thing'.*
2. Professional Development Have you used SM for your professional development? Are you a member of a community of practice? Have you collaborated in CoPs? What social media resources do you use? How do you use them?	*Yeah I've done several online courses, either one through a masters program, but I had taken one on differentiated Instruction and Instructional Design. We did online classes.* *My experience was fun in a way because you could in a way get other ideas and see where people were coming from more than just what was in your school. You get different ideas and different feedback from people around the country. It was kids of fun.* *I access a network of teachers for my own interests. I go on a couple of forums and a couple of blogs to access and to get ideas and to say, 'heh can I run something past you guys?' because sometimes you have questions and you don't want others in your district to know about it or select people to know about it so I run ideas through others or sometimes they do the same. You know I'm looking for an idea for the end of the year, what do you got, I want something different, just those types*

	of things.
3. In the Classroom Do you use social media in your classroom? What social media resources do you use? How do you use them? (Detail on the type of video/ YouTube, length/ duration of the resource, (3-5 minutes), type of images, what Web sites? Do you access open resources, what kind of learning games.	*I do, definitely use social media and some blogs to pull up pictures when I'm trying to convey or start something new, to kind of give them here's what we're going to do and give them that pre-knowledge, that pre introduction type thing, to get them excited to do the projects that we're going to be starting.* *I usually access it for resources or I'm the one who's leading the activity. Like if I pull it up on our Smartboard or our interactive whiteboard we do it as a whole group type of thing. Like we look at videos off of YouTube especially if we're working on a skill or that type of thing, but I'm usually the one who's leading and controlling where they're going on it versus just letting them click and go. We have computers and iPads that we use, but when I'm doing my whole group type of thing, we do Smartboards we have a big Smartboard that the kids do use that we convey everything through.* *What else do you want to know, I don't know, we try and do as much technology as we can and technology is doing a lot more. I try and get them involved more, like when we're doing and I've done in the past, not so much this year, but I have my own blog for the classroom so we put things on there together. Sometimes they'll say 'he miss, show me, can you put that on the blog so I can show my mom and dad'. So I've done that too. We use blogs to put some pictures and stuff on it. The kids kind of get interested in that, some of them want to go home and they show their parents what they've done at school that day or show a picture or a project that we've worked on so we do blogs such as that you know trying to convey things. So they get a little more involved in that more than anything. The kids get interested and the parents will make comments on the blog on our personal blog about different things you know 'you guys are doing a great job' or you know I'm so proud' just different types*

	of things because the kids like to see the comments and they want to read them 'can you read it can you read it there's a comment on there, there's a number' so they know it they feel if there's a number there they know that someone has said something to them. So then we have to read what they said and who wrote it. The get pretty excited about those sorts of things. Yeah they know a little too much about the numbers and the comments. They're barely learning to read, but they know what those mean and they want to know. So it's great, it's fun and I can say who wrote it cause the parents, they'll say, heh AK, that's Julia's mom or Kevin's mom or dad so they get excited that way which is kind of nice, they get really excited, it's fun to see their little spark and they'll write other things too, we've put things on there that we're learning about, not just anything, what we're learning, what we want to show mom and dad what we're doing type of thing, we just have to limit what we put on there. *I just do blogspot.com it was just a free one that was a little bit easier for me to us cause I might find something and I always try to use something from my aspect. Even though I know technology, but I want something that will be easy to use but that's easy for parents to access.* *The kids are definitely growing up with more touch technology, cause we went up to the computer lab and we have mice and keyboards and that type of thing and they a lot of them struggled with the mouse and how to use a mouse and clicking with the mouse. And I said that you guys all talk about playing games and they say, well miss you just take your finger and you go 'beu' and 'gotcha'! So it's like even 5 years ago they were pretty fluent o using a mouse well now they're not fluent on using that type of technology, they're using an iPod or iPad where you just take your finger and it does everything for you versus a mouse where you have to move and do all those types of things so…*

4. General Use Are you more inclined to use social media at home, for professional development of for classroom use?	*Yes.*
5. **What benefits do you see to the use of social media in education**	*I think it's a great way to share ideas with people that you would never meet. I mean because you sometimes get stuck in a rut. I always do this at the end of the year I always do this for Mothers' Day and sometimes you're like I'm tired of doing this for mothers' day, what else is out there. I mean if you're district is pretty much stuck in a rut like I need some new ideas so you can go out there and you can also post some ideas that you find saying heh here's something new that I've tried, what do you think. You try and get feedback, I like that. It's nice cause I follow teacher blogs and I go on a couple of forums and post ideas or just chit chat type of thing and I think it has helped me improve what I do because sometime I go on there and say I'm having issues with a student who's learning what can I do different, or what have you done or what can I try it's great to get different ideas and different perspectives without being judged per say. Because you know you have some who are judged because they say you don't know what to do well you should know what to do. Well sometimes you have students who come through and they throw you a curve ball so you don't always know what to do type of things. So I think it's a great way to share ideas and get new ideas.*
6. **Do you have any concerns in relation to use of social media for education purposes?**	*Well I don't necessarily have concerns about it. When I try to use it in the classroom or for the classroom, I try to make sure that it's appropriate and appropriate context cause sometimes especially if you're on YouTube one might say one thing but then might totally be something different when you click on the video to play or the music to play, so some of those things that might not be labeled correctly would be a huge concern so I*

	always really try to preview and make sure that everything is appropriate especially for kindergartners cause they don't need to see or be involved with things that are not ok. Yes, and they wont understand either so I always try to do that. And they'll say 'click on this one or click on that one. You know with YouTube at the end they'll pop up with other videos and I say 'no we're not going to play that one today no you know cause I haven't seen that one before so I don't know exactly what it is. So I try to you know do as much as I can but sometimes, yeah, it's not happening.
7. **School Policy** Does your school have a policy on access to technology (Infrastructure, specific technologies, mobile phones, etc.), specifically on social media access and use? Detail?	*We do have a policy, but they're pretty open on things, you know obviously not visiting things sites that are not appropriate, that type of thing, but they're pretty liberal they really want us to bring technology and social media into the classroom and for the kids because that's the wave of the future and that's what these kids need to learn. So that's how they learn and that's how they need to learn because by the time they graduate from High school, it's going to be all technology or technology based.*
8. Federal/ State Policy Does government policy, e.g. NCLB impact on funding/ access to Internet and social media technologies?	*Not that I know of I know a lot of my state policies go with what the district policy is and each school district is different with their policies no policy is the same in the district. You know some districts don't allow you to do Facebook or social media at all whereas in my district, you can do Facebook, you're not banned from them. I know that during kid time, every student has their own log into the computer system they can do they cannot go on some type of sites, they're blocked during school time, unless you get, unless the teacher gets*

	special permission to have those unlocked for the students. Our district wants to use technology and they don't want to ban them from most sites.
9. Any other comments in relation to social media?	*I don't think so. I just think that it's going to keep growing and building and it's going to be the wave that we're going to be following so that type of thing.*

Appendix L

Research Ethics Committee: Notification Form for Low-Risk Projects and Undergraduate Dissertations

DCU Research Ethics Committee has introduced a procedure for notification to the committee of:

1. Low-risk social research projects, in which personal information that is deemed not sensitive is being collected by interview, questionnaire, or other means

2. Dissertations on undergraduate programmes in all disciplines.

The committee requires researchers to concisely answer the following questions **within this form** (before the project starts):

Project Title:
Social Media usage in the professional development and classroom practice of primary and post-primary teachers in Ireland and the United States - a comparative mixed methods study.

Applicant Name, School/Unit and E-mail:
Name: Teresa Hagan (Doctoral Researcher)
Faculty: School of Education Studies, Faculty of Humanities and Social Sciences

E-mail: Teresa.hagan@hmhpub.com

If a student applicant, please provide the additional information:
Level of Study: Taught PhD
Supervisor Name: Dr. Charlotte Holland
E-mail: Charlotte.Holland@dcu.ie

Questions:

1. Provide a lay description of the proposed research (approx. 300wds):

The use of online technologies or information and communications technologies (ICTs) in education is facilitated by the permeation of the World Wide Web (WWW) and Internet technologies in all aspects of everyday life. These technologies as well as social networking sites, such as Facebook, LinkedIn, allow for social collaboration "in the cloud", facilitating forums where one can chat, post messages and/ or send multiple forms of information to each other. The widespread availability of broadband and Wi-Fi, mobile devices including PDAs and the latest iPods, video, weblogs and podcasts is influencing the expectations of users, including teachers and students in the primary and post-primary sectors. The digital natives, or the Net generation as they are sometimes referred, understand the opportunities of the Internet, often better than the teachers who did not grow up with the Internet (U.S. Department of Education, 2004). The anecdotal evidence suggests that these digital natives are adopting social media technologies as a means of communication, collaboration and sharing resources at a phenomenal rate outside school contexts. Permeation of these technologies within educational settings is expected to increase rapidly in the coming years. However, there is little empirical evidence on teachers' perspectives and usage of social media to support their continuing professional development or their classroom practice. This comparative study (U.S. and Ireland) aims to explore teachers' perceptions, attitudes, and experience of the integration of social media in classroom practice and/ or professional development. The study aims to produce a rigorous analysis, through quantitative and qualitative examination, of the degree of infusion of social media in the professional development and/ or classroom practice of primary and post-primary teachers. Approximately 4,000 teachers will be surveyed across both countries (2,000 US teachers with an

expected response rate of 25% and 2,000 Irish teachers with an expected response rate of 25%).

2. Detail your proposed methodology (1 page max.):

A Mixed Methods approach will be used for the purposes of this research, underpinned by a post-positivist philosophy, where the ontological position is that the participants are socio-technologically-enabled beings and the epistemological perspective is that knowledge gained is subjective in nature. The Mixed Method approach will be based on the *Explanatory Sequential Mixed Methods Design*, which is conducted across two phases; the initial phase involving qualitative data collection and analysis, and the second phase involving qualitative data collection and analysis. This research does not start out with any hypothesis about models of social media usage. Instead, it sets out on a broader investigation to explore perceptions, attitudes, and barriers to the integration of social media in teachers' professional development and classroom practice. The analysis of the quantitative data will provide an overview of the use of social media in the professional development and practice of primary and post-primary teachers. The analysis of the quantitative data will lead to refinement, extension and/ or deeper exploration of the use of social media in particular contexts. Thus, the qualitative data will be used to refine the results or findings from the quantitative data.

The data collection tools will comprise an online survey and interviews. The online survey will be deployed using SurveyMonkey (http://www.surveymonkey.com). Stage one involves a pilot of the online survey to a sample population of teachers to test the validity and internal reliability of the instrument. Stage 2 involves the deployment of the survey to the wider population of teachers in US and Ireland (10,000 teachers), to ascertain their views in relation to the integration of social media in professional development and classroom practice. Stage three involves follow up interviews with approximately 10 teachers on factors, trends or issues emergent from the analysis of the online survey. These tools will set out to qualify, examine, and further understand the factors affecting the integration of social media integration in professional development and classroom practice.

3. Detail the means by which potential participants will be recruited:

Approximately 10,000 teachers will be surveyed across the United States and Ireland. Houghton Mifflin Harcourt Publishing Company has access to a database of over 5,000 teachers; this will comprise the US sample. The Irish National Teachers' Organization (INTO) has a database of approximately 5000 teachers and this will comprise the Irish teachers sample.

4. How will the anonymity of the participants be respected?

The use of the online survey will preserve the anonymity of those participants who do not wish to be identified. The online survey can be completed anonymously. However, survey participants will also be offered the option to participate further in phone or Skype interviews. Participants who are willing to engage in interviews will be asked to provide a phone number or Skype-name. However, they will be provided with the option to have their data recorded

anonymously (i.e. through the use of pseudo-names or codes to preserve their identity). Anonymity will also be respected in the management of the records and data. The researcher intends to keep all personal information separate from the data gathered by the use of alphanumeric codes assigned to each participant. This coding system will be used to ensure that anonymity can be guaranteed, e.g. Teacher 1 (T1) may refer to Mary Jones and so on using an alphabetical and numerical code to identify participants.

5. What risks are researchers or participants being exposed to, if any?

There are no perceived risks to participants of this research project. Participants will be fully informed about the research through the Participant Consent Form and Plain Language Statement. They are also informed that they should contact Teresa Hagan or Dr. Charlotte Holland at DCU if they have any questions or concerns in relation to the study. This information is provided to participants through the consent form and the plain language statement.

In the unlikely event of a participant disclosing particular inappropriate information or demonstrating anxiety during the interviews, he or she will be referred to their line manager for additional support.

6. Have approval/s have been sought or secured from other sources?

Yes, I have received approval from the following sources in support of initiating this research dissertation:

Houghton Mifflin Harcourt:
Approval has been received from Bethlam Forsa, EVP Content Development and Publishing Operations (my line manager) and Margaret De Boer and Brian Feltz, Product Management, at HMH, who support this work and have provided me with access to the database of 2,000 US teachers across PreK-12.

INTO:
Approval has been sought and confirmation is pending from the INTO who can provide access to the database of teachers for the purposes of this research study. Fidelma Morris, Director Online Professional Development at INTO is the contact.

7. Please confirm that the following forms are attached to this document:
Informed Consent Form: Yes
Plain Language Statement: Yes

If not, explain why: NA

PLAIN LANGUAGE STATEMENT

DUBLIN CITY UNIVERSITY

Research Study Participant Information

I. Research Study Title

Social Media usage in the professional development and classroom practice of primary and post-primary teachers in Ireland and the United States - a comparative mixed methods study.

Principal Investigators: 1. Dr. Charlotte Holland Lecturer, Education Studies Faculty (Supervisor)
2. Teresa Hagan, M.Ed., B. Ed. (Hons.), PhD Student

Address: School of Education Studies
Faculty of Humanities and Social Sciences
Dublin City University
Dublin 9

Telephone: + 353 86 6053960

Email: Charlotte.Holland@dcu.ie
Teresa.Hagan@hmhpub.com

PLEASE READ CAREFULLY

Your confidentiality in this research project is assured. Confidentiality of information is subject to legal limitations. Any information provided by you that could identify you from the forums or online questions will be removed if it is to be used in the research report.

I. Your Participation is voluntary

It is up to you to decide if you want to participate in this research study. Before you do, it is important for you to understand what the research is about and what you will be asked to do. This statement and the consent form will tell you about the study, why the research is being done, and what will be asked of you during the study, as well as the benefits and risks of your participation.

If you decide to participate, you are still free to leave at any time, without giving any reasons, and with no consequences. If you decide not to participate, you do not have to provide any reasons for your decision.

Please take the time to read all of the information provided here before making your decision.

II. Introduction to the research study

The use of online technologies or information and communications technologies (ICTs) in education is facilitated by the permeation of the World Wide Web (WWW) and Internet technologies in all aspects of everyday life. These technologies as well as social networking sites, such as Facebook, LinkedIn, allow for social collaboration "in the cloud", facilitating forums where one can chat, post messages and/ or send multiple forms of information to each other. The widespread availability of broadband and Wi-Fi, mobile devices including PDAs and the latest iPods, video, weblogs and podcasts is influencing the expectations of users, including teachers and students in the primary and post-primary sectors. The digital natives, or the Net generation as they are sometimes referred, understand the opportunities of the Internet, often better than the teachers who did not grow up with the Internet (U.S. Department of Education, 2004). The anecdotal evidence suggests that these digital natives are adopting social media technologies as a means of communication, collaboration and sharing resources at a phenomenal rate outside school contexts. Permeation of these technologies within educational settings is expected to increase rapidly in the coming years. However, there is little empirical evidence on teachers' perspectives and usage of social media to support their continuing professional development or their classroom practice. This comparative study (U.S. and Ireland) aims to address this by exploring teachers' perceptions, attitudes, and experience of the integration of social media in classroom practice and/ or professional development.

III. Details of what involvement in the research study will require

You will be part of a community of approximately 10000 U.S. and Irish teachers invited to participate in an online survey. You will be asked to describe your perceptions, attitudes, and experience of how social media has been utilised in your professional development or classroom practice. If you consent to a follow up interview, you will be asked more in-depth information on your use of social media.

A report will be written at the end of the project, which may include comments made by you in your online survey or interview – however, the comments will be coded so that no one will know that it was your comment(s) in the report. The information gathered during this project will be securely held in the School of Education Studies, Dublin City University for two years, after which it will be destroyed.

This project is expected to run from July 2011 to April 2013.

You can withdraw from the project at any time. There will be no penalty for withdrawing before all stages in the project have been completed.

For more information about this research project, please contact Teresa Hagan, School of Education Studies, Dublin City University, Glasnevin Dublin 9, Ireland.

VI. Potential risks to participants from involvement in the research study (if greater than encountered in everyday life)

There are no significant risks to participants in this study. If you experience any negative effects from your participation in this study please feel free to contact my supervisor or me at any time.

V. Benefits (direct/ indirect) to participants from involvement in research study

The benefits of becoming involved in this project are that you will contribute to a study to ascertain the state of the art around the infusion of social media in primary and/ or post-primary education.

VI. Advice as to arrangements to be made to protect confidentiality of data, including that confidentiality of information provided id subject to legal limitations

All information gathered from the online surveys and follow up interviews will be securely stored on my computer.

All personal information will be kept separate from the information gathered using alphabet and number codes for each participant. This coding system will be used to make sure that you are anonymous, e.g. Teacher 1 (T1) may refer to Mary Jones and so on using an alphabetical and numerical codes.

VII. Advice as to whether or not data is to be destroyed after a minimum period

Information gathered from this study will be destroyed two years after the study is completed unless you are notified otherwise in writing by me, and your further written consent is received.

Note: If you have concerns about this study and wish to contact an independent person, please contact:

The Secretary, Dublin City University, Research Ethics Committee, c/o Office of the Vice President for Research, Dublin City University, Dublin 9, Ireland. Tel: +353 1 7008000

INFORMED CONSENT FORM

DUBLIN CITY UNIVERSITY

Informed Consent Form

I. Research Study Title

Social Media usage in the professional development and classroom practice of primary and post-primary teachers in Ireland and the United States - a comparative mixed methods study.

Principal Investigators: 1. Dr. Charlotte Holland Lecturer, School of Education Studies (Supervisor)
2. Teresa Hagan, M.Ed. B. Ed. (Hons.), PhD Student

Address: School of Education Studies
Faculty of Humanities and Social Sciences
Dublin City University
Dublin 9

Telephone: + 353 86 0469521

Email: Charlotte.Holland@dcu.ie
Teresa.Hagan@hmhpub.com

II. Clarification of the purpose of the research

This comparative study (U.S. and Ireland) aims to explore teachers' perceptions, attitudes, and experience of the integration of social media in classroom practice and/ or professional development.

III. Confirmation of particular requirements as highlighted in the Plain Language Statement

I agree to take part in an online survey as part of a Ph.D. study entitled "Social Media usage in the professional development and classroom practice of primary and post-primary teachers in Ireland and the United States - a comparative mixed methods study", conducted by Teresa Hagan in the School of Education Studies at Dublin City University.

I am aware that I can contact the Principal Investigators listed above if I have any questions or concerns relating to this research project.

Participant – please complete the following (Circle Yes or No for each question)

Have you read or had read to you the Plain Language Statement? *Yes / No*

Do you understand the information provided? *Yes / No*

Have you had an opportunity to ask questions and discuss this study? *Yes / No*

Have you received satisfactory answers to all your questions? *Yes / No*

Are you aware that your online survey responses will be recorded and analysed for the purpose of this research? *Yes / No*

Are you aware that if you volunteer to engage in follow up interview/s, that the interview/s will be recorded? *Yes / No*

Do you agree that 'direct quotes' or 'summaries of quotes' can be used (anonymously) from the transcripts of your interview/s? *Yes / No*

Do you understand that the researcher may publish the findings of the study? *Yes / No*

IV. Confirmation that involvement in the Research Study is voluntary

Your participation in this study is voluntary. Please take time to consider whether you wish to take part in this research study or not. If you have any questions about the research, please contact me, Teresa Hagan by phone on + 353 86 0469521 or e-mail at Teresa.Hagan@hmhpub.com.

If you decide to participate in this study, you may withdraw from the Research Study at any point, without giving any reasons. There will be no penalty for withdrawing before all stages of the research have been completed. If you decide not to participate or sign this consent form, you do not need to provide any reasons for your decision.

V. Advice as to arrangements to be made to protect confidentiality of data, including that confidentiality of information provided is subject to legal limitations

The research methodology will provide you with confidentiality and anonymity since the focus is on gaining an understanding from the data and will not report

what any particular person says. Your anonymity will also be protected in the management of the records and data. The researcher will keep personal information separate from the data derived from online survey responses and follow up online focus groups by the use of alpha-numeric codes. A code will be assigned to you at the start of the research and your name will not appear on any record. As with any research study or collection of documents, they can become the subject of legal proceedings. In this unlikely event, only the minimum data necessary for this legal purpose would be revealed.

All information obtained from you during the research will be kept confidential. Recordings and notes about the research will be stored in a locked file. Data will be securely held for two years after the research project is completed and accessed only by the named researchers within this study. The data will be securely disposed of after this.

Confidentiality of participants in this research project is assured. Confidentiality of information is subject to legal limitations. Should an extract from the reflections in your data or responses to the online survey be used for research purposes, any information that would identify you will be removed. Identifying information about you or your school will not be used in any reports of the research.

VI. Signature:

I have read and understood the information in this form. My questions and concerns have been answered by the researchers, and I have a copy of this consent form. Therefore, I consent to take part in this research project

Participants Signature: _____

Name in Block Capitals: _____

Date: _____

DUBLIN CITY UNIVERSITY

Draft research Questions

Teacher Online Survey Questions

General

1. Name: Teacher 14
2. Gender: Male Female
3. Teaching Experience Category: 0-4 years 5-15 years 15-30+ years
4. Level of Educational Institution: Elementary/ Primary Second Level /Middle School High School
5. School Type: Mainstream Special Needs Advantaged Disadvantaged
6. Rate your own skills level with regard to your proficiency of technology (poor, fair, good, very good, excellent/ proficient)
7. What is your understanding of social media?
8. What social media have you used and for what purpose?

Professional Development/ In-career professional development/ Continuous Professional Development (CPD)

1. Have you recently used information and communications technology (ICT) in your professional development? If yes, what have you used?
2. Have you engaged in the use of social media for your professional development?
3. What types of social media have you used in your professional development? Describe
4. What typed of social media have you not used? And why?
5. What advantages do you see to the use of social media in the context of professional development (CPD)
6. Do you have concerns regarding the use of social media for teacher professional development?
7. What strategies do you use to mitigate these concerns?
8. What barriers exist to the use of social media for professional development?
9. How can these barriers be overcome?
10. Give one example of what you perceive to be a good example of the use of social media for teacher professional development.

Classroom Practice

1. Have you recently used information and communications technology (ICT) in your classroom / instructional practice? If yes, what have you used?
2. Have you engaged in the use of social media in your classroom / instructional practice? Describe.
3. What types of social media have you used in your classroom/ instructional practice?
4. What typed of social media have you not used? And why?
5. What advantages do you see to the use of social media in the context of your classroom / instructional practice?
6. Do you have concerns regarding the use of social media in classroom / instructional practice?
7. What strategies do you use to mitigate these concerns?

8. What barriers exist to the use of social media for classroom / instructional practice?
9. How can these barriers be overcome?
10. Give one example of what you perceive to be a good use of social media for classroom / instructional practice.

List of social media that will be included in the answers for selection by the teachers:

- Email
- Instant Messaging
- Discussion forums including
- Collaborative projects including weblogs, social blogs, micro blogging (e.g. Twitter, Wikipedia)
- Online surveys, ratings systems Podcasts
- Sharing of photographs, pictures, video, etc.
- Content Communities (e.g., YouTube)
- Online Communities of Practice
- Online surveys/ Rating systems
- Social Networking Sites, wall-postings (e.g., Facebook)
- Virtual Game Worlds (e.g., World of Warcraft)
- Virtual Social Worlds (e.g. Second Life).
- Crowdsourcing
- Skype/ Video conferencing/ Voice Over IP

- NB – The application should consist of **one electronic file only**, which incorporates all supplementary documentation – including all documentation being presented to the participants (e.g. Informed Consent Form, Plain Language Statement, questionnaires, surveys, interview schedules etc).
- Student applicants must cc their supervisor on that e-mail – this applies to all student applicants, undergraduate, masters and postgraduate.
- The completed application must be proofread and spellchecked before submission to the REC. All sections of the form should be completed.

Applications which do not adhere to these requirements will not be accepted for review and will be returned directly to the applicant. The administrator to the Research Ethics Committee will assess, on receiving such notification, whether the information provided is adequate and whether any further action is necessary. Please complete this form and e-mail to fiona.brennan@dcu.ie

Please note: Project supervisors of dissertations on undergraduate programmes have the primary responsibility to ensure that students do not take on research that could expose them and the participants to significant risk, such as might arise, for example, in interviewing members of vulnerable groups such as young children. In general, please refer to the Common Questions on Research Ethics Submissions for further guidance on what research procedures or circumstances might make ethical approval necessary (http://www.dcu.ie/internal/research/questions_ethics_submissions.pdf)

Appendix M

Phase 1 Research: Information Sheet for Participants

Dear *Name*,

I am currently undertaking a research study with the Education Studies faculty Dublin City University, in part fulfilment of the Professional Doctoral Programme. I am inviting you to participate in my research project which is

entitled *Online Learning in the Continuing Professional Development (CPD) of Primary School Teachers.* The purpose of this study is to explore the provision of online learning courses for the continuing professional development of teachers in Ireland.

You have been selected to participate in this research study, along with twenty other people, including teachers, Department of Education and Science Inspectors, INTO and NCTE representatives because of your engagement in a recent online Summer course.

The proposed starting date for this study will be February 2008 and you will be asked to take part in a semi-structured interview/ focus group, which will last for approximately 45 minutes and which will take place on your school premises. With your permission, the interview will be recorded on an audio tape. Please note that I may ask to contact you by telephone or e-mail if I have any follow-up questions after the interview. It is hoped that this research study will benefit the participants by identifying areas of further development online teacher education.

All information obtained from you during the research will be kept confidential. Recordings and notes about the research will be stored in a locked file. Each person who participates in the research will be given a numeric code to ensure anonymity. ldentifying information about you or your organisation will not be used in any reports of the research. After this research is completed, I may save the tape recordings and my notes for a period of up to two years for the purpose of research. The same level of confidentiality guaranteed in this research will apply to the storage and use of materials.

Your participation in this research is voluntary. Please take time to consider whether you wish to take part in this research study or not. If you have any questions about the research, please telephone me, Teresa Hagan at 086 6053960 or contact me by e-mail: teresahagan@iol.ie. If you agree to take part in this research, I will ask you to sign a consent form at the interview/ focus group. You will be given a copy of this agreement for future reference.

Please note that this research study is being conducted under the guidance of Dr. Charlotte Holland and the School of Education Studies at Dublin City University. If you have any questions regarding your treatment or rights as a participant in this research project please feel free to contact Dr. Charlotte Holland by e-mail: Charlotte.Holland@dcu.ie. Many thanks for taking the time to read this information email.
Yours sincerely, Teresa Hagan

Appendix N

Phase 1 Research: Letter of Consent

I agreed to be interviewed as part of a Ph.D. study on developing and integrating technology in Adult Literacy Education, conducted by Teresa Hagan in the School of Education Studies at Dublin City University.

l have read the transcript or summary of this interview attached, and agree to findings being drawn from this information.

I agree that 'direct quotes' or 'summaries of quotes' may be used from the transcript in the research thesis.

I understand that my name will not be used in this research unless I give permission below.

The purpose of the study has been explained to my satisfaction.

I understand that, upon request, I may have a full description of the results of the study after its completion.

I understand that the researcher may publish the findings of the study.

I am aware that I can contact the researcher, Teresa Hagan by phone: 086 6053960 or e-mail: teresahagan@iol.ie if I have any questions about this project.

I HAVE READ AND UNDERSTOOD THIS CONSENT FORM AND I AGREE THAT THE INFORMATION ATTACHED CAN BE USED IN THE STUDY.

Participant name: (please print):

Signature of participant:

Date:
Telephone number:
E-mail address:

Do you agree for your full name to be used in the research? (please tick)
Yes [ ]
No [ ]

(If NO, then your identity will be hidden using coded numbering: e.g., a teacher named Angela Smith could be coded as *Teacher 8*.

Appendix O

Phase One Research: Extra Personal Vacation - Rule 58 of the Rules For National Schools

Circular 37/97

AN ROINN OIDEACHAIS AGUS EOLAIOCHTA | DEPARTMENT OF EDUCATION AND SCIENCE

Note: This electronic version was re-typed from the original in May, 2006

PRIMARY BRANCH

CIRCULAR LETTER TO BOARDS OF MANAGEMENT AND PRINCIPAL OF NATIONAL SCHOOLS

EXTRA PERSONAL VACATION
RULE 58 OF THE RULES FOR NATIONAL SCHOOLS

The Minister for Education wishes to refer to Rule 58 OF THE Rules for National Schools, and to confirm that the entitlement to extra personal vacation (EPV) on foot of attending approved summer courses is as follows:

1. COURSE OR COURSES AMOUNTING TO 15 DAYS OR MORE

ATTENDANCE	EPV awarded
Full	5
9 – 14 days	4

No EPV will be awarded for less than 9 days attendance

2. COURSE OR COURSES AMOUNTING TO 9 - 14 DAYS

ATTENDANCE	EPV awarded
Full	4
6 – 8 days	3

No EPV will be awarded for less than 5 days attendance

3. COURSES OR COURSES AMOUNTING TO 5 – 8 DAYS

ATTENDANCE	EPV awarded
Full	3
4 days	2

No EPV will be awarded for less than 4 days attendance

It should be noted that no EPV entitlement arises where attendance at any specific course amounts to 3 days or less, and, in particular, that 5 DAYS EPV IS THE MAXIMUM WHICH MAY BE AWARDED IN ANY SCHOOL YEAR.

Enquiries in relation to EPV scheme should be addresses to Department of Education, **Primary Administration Section 1**, Athlone, Co. Westmeath. Tel 01 8734700 or 090 64 83600 (September 1997