An exploration into the pedagogical benefits of using social media: can educators incorporate social media into pedagogy successfully?

By

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Abstract

Social media and social networking sites have become popular across governments, enterprises, and non-profit making organisations. Nevertheless, education has evidenced conflicting views around the role that social media ought to play in pedagogy. This thesis examines whether or not social media can be incorporated into pedagogy successfully. The research aims are to examine the current relationship between social media and pedagogy, to identify factors that influence teacher engagement, and to determine whether or not social media can make an impact on student engagement and performance. The study is underpinned by Trowler’s (2008) socio-cultural theory and the research is based on a mixed methods approach. I applied a phase of online quantitative surveys that were analysed using descriptive statistics and two subsequent phases of interviews that were analysed thematically. I adopted purposeful sampling to recruit 434 secondary teachers with QTS to participate in the study. The results show that there is little meaningful, transformative professional development in schools in respect of using social media for pedagogy (Kennedy 2005; 2014). I argue that CPD in schools should focus on developing pedagogical strategies with technology as opposed to focusing on the technology in its own right. Furthermore, teachers’ reflections indicated that the differences between the social media platforms are profound; thus, grouping them together can become problematic. In other words, YouTube’s functionality is applied in an opposite way to Twitter’s and with different audiences. Additionally, the study has uncovered a lack of thought towards applying technology in education policymaking, and this became problematic for schools during the U.K. lockdown. The study’s major themes illuminate the challenges involved with successfully embedding technology in education, particularly social media.
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<td>American Academy of Paediatrics</td>
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<tr>
<td>AC</td>
<td>Abstract Conceptualization</td>
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<td>AE</td>
<td>Active Experimentation</td>
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<td>AI</td>
<td>Artificial Intelligence</td>
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<td>BERA</td>
<td>British Educational Research Association</td>
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<td>CE</td>
<td>Concrete Experience</td>
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<td>CHAT</td>
<td>Cultural-historical Activity Theory</td>
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<td>CK</td>
<td>Content Knowledge</td>
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<td>CLE Ex</td>
<td>Changing Learner Experience</td>
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<td>COPPA</td>
<td>Children’s Online Privacy Protection Act</td>
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<td>COVID-19</td>
<td>Coronavirus disease</td>
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<td>CPD</td>
<td>Continuous Professional Development</td>
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<td>DfE</td>
<td>Department for Education</td>
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<td>DPA</td>
<td>Data Protection Act</td>
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<td>ECF</td>
<td>Early Career Framework</td>
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<td>ECT</td>
<td>Early Career Teacher</td>
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<td>GDPR</td>
<td>General Data Protection Regulation</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>HE</td>
<td>Higher Education</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IF</td>
<td>Impact Factor</td>
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<td>IWB</td>
<td>Interactive Whiteboards</td>
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<td>LMS</td>
<td>Learning Management System</td>
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<td>LOTI</td>
<td>Levels of Technology Framework</td>
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<td>Acronym</td>
<td>Description</td>
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<td>MANOVA</td>
<td>Multivariate Analysis of Variance</td>
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<td>MMR</td>
<td>Mixed Methods Research</td>
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<td>MP</td>
<td>Member of Parliament</td>
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<td>NC</td>
<td>National Curriculum</td>
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<td>NQT</td>
<td>Newly Qualified Teacher</td>
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<tr>
<td>NSPCC</td>
<td>National Society for the Prevention of Cruelty to Children</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation &amp; Development</td>
</tr>
<tr>
<td>OU</td>
<td>Open University</td>
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<tr>
<td>PD</td>
<td>Professional Development</td>
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<td>PEAT</td>
<td>Partnership on Employment &amp; Accessible Technology</td>
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<td>PGCE</td>
<td>Postgraduate Certificate in Education</td>
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<td>PK</td>
<td>Pedagogical Knowledge</td>
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<td>PMLE</td>
<td>Persuasive Multimedia Environment</td>
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<td>QTS</td>
<td>Qualified Teacher Status</td>
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<td>RO</td>
<td>Reflective Observation</td>
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<tr>
<td>SAMR</td>
<td>Substitution Augmentation Modification and Redefinition</td>
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<tr>
<td>SAS</td>
<td>Statistical Analysis System</td>
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<tr>
<td>SD</td>
<td>Standard Deviation</td>
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<tr>
<td>SEN</td>
<td>Special Educational Needs</td>
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<td>SJR</td>
<td>SCImago Journal Rank Indicator</td>
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<td>SLT</td>
<td>Senior Leadership Team</td>
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<td>SPSS</td>
<td>Statistical Product and Service Solutions</td>
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<td>SNS</td>
<td>Social Networking Services</td>
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<td>STEM</td>
<td>Science Technology Engineering and Mathematics</td>
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<tr>
<td>TCoP</td>
<td>The Technology Code of Practice</td>
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TEL Technology Enhanced Learning
TES The Times Educational Supplement
TPACK Technological Pedagogical Content Knowledge
TK Technological Knowledge
U.K. United Kingdom
U.S. United States of America
VC Vulnerable Children
VLE Virtual Learning Environment
VR Virtual Reality
ZPD Zone of Proximal Development
CHAPTER 1 - INTRODUCTION

1.1 Background

In today’s increasingly network-driven society, we have a generation of individuals who are not only part of the digital age but likewise the subculture of social media. Social media was initially defined as ‘a part of our everyday communication and information sharing’ (Spencer 2014, p. 323). As digital platforms evolved, the use of social media and social networks as interchangeable terms became redundant. Social networking is creating a profile and making connections (see Soderholm et al. 2016), whereas social media involves turning web-based and mobile communications into social dialogue (for example, as outlined in Cohn 2018; Soderholm et al. 2016). Social networking sites hold the potential to drive our primary form of communications, and they can dictate who is popular and who is not, they advertise products we did not know we wanted, and through information processing and artificial intelligence, they sub-consciously educate us.

The ubiquity of social media including Facebook and Twitter is no more apparent than in the education industry as it can aid communication between educators and learners (Guckian et al. 2021). Anecdotally, I have experienced pupils arrive at school and instantly recall last night’s social media activities. Nevertheless, few schools take advantage of how children become enthused in these ways and the potential these platforms may have in formal learning contexts. Ferguson (2013) reported that many teachers are not implementing any social media strategies in their classrooms, and this appears to be the case almost a decade on (Dennen, Choi and Wood 2021). Schools have introduced 21st-century technology into their classrooms with little, if any, alteration to the delivery of information.

Many social networking sites have been thought to break down traditional hierarchies in terms of society and global geography (Lewis 2017). Twitter, for example, can empower learners to engage with individuals from all over the world, often sharing educational resources
for free. The benefits of using Twitter and the growing role it has on education accelerates debates about how best it can be used to promote learning and improve engagement (Lewis 2017; Marich 2016; McKay et al. 2014; Juno et al. 2011; Junco, Elvansky and Heiberger 2012).

1.2 Research objective and aims

The focus of this thesis is to understand if educators can incorporate social media as an educational resource into their pedagogical practice successfully. The theoretical perspective used in this research is through the lens of socio-cultural theory (Trowler 2008). The research aims are to: 1) examine the current relationship between social networking sites and pedagogy, 2) distinguish factors that influence teacher engagement with social networking sites in their pedagogical practice, 3) determine, using a mixed methods approach, whether or not social media engages students and enhances academic performance and the degree of which this is compared with traditional teaching methods, and 4) design a framework for teachers to follow when implementing social media strategies in the classroom. The following section will amplify the main research aims of the present thesis. Using Guba’s (1994) characterisation of research paradigms, the aims have been constructed using a post-positivist paradigm with a critical realist ontological approach and constructivist epistemology.

1.2.1 Examine the current relationship between social networking sites and pedagogy

Social media influences 21st-century operations and whether referenced with communications, business practice or education, social media is at the heart of the modern-day individual. Almost all industries, including corporations, non-profit and government organizations share the need for employees to have social media expertise (see Freberg and Kim 2018). Within education, few schools have implemented social media strategies in their learning programmes, and at times the topic is often ignored. The main reasons for this are outlined by Fox (2013) and include a) the ambiguity of how to implement technology effectively, b) accessibility to all students and c) does the potential outcome outweigh the
additional workload? Furthermore, Dennen, Choi and Wood (2021) distinguish themes within and beyond education that influence social media decisions in the classroom. Within education, Fox (2013) argues for the importance of the transformative effectiveness of pedagogy and that this ought to be considered in as holistic a way as possible in educational contexts. However, outside education, scholars have been inclined to focus on health concerns, professional identity, and social relationships as significant themes. This is particularly interesting as it indicates that there is increasingly a cross-over between technology, health, and education, and subsequently, professional development that does not equip teachers for the broader societal challenges may not be effective in changing their beliefs to a more favourable social media viewpoint.

There may be possible links between a generation of social media proficient students and a productive workforce, thus, an absence of social media in the classroom could have a detrimental impact on the future workforce due to the benefits that a ‘social media savvy employee’ may bring (Junco et al. 2012). Furthermore, the expanded use of social media and the evolution of how humans communicate may be advantageous in promoting and enhancing workforce diversity (Martin et al. 2022). Nevertheless, the specifics of how this ought to work in practice are not mentioned, and some researchers have even indicated that because social media plays a central role in forming our views, it may in fact be a means of encouraging certain biases (for example in the work of Pitoura 2020).

Facebook and Twitter, along with other major social media platforms have age restrictions for users. The Children’s Online Privacy Act (COPPA) dictates the minimum age for using social networking sites in the U.K is 13 years. COPPA was first brought into force in 1998 to reflect a governance of technologies such as Google and Microsoft (Stephens 2020). Essentially, COPPA covers the need for parental consent when companies collect information from children under the age of 13 and this applies to SNS. In comparison, the introduction of
General Data Protection Regulation (GDPR) and the adoption of The Digital Age of Consent Bill in 2018 means that in the EU any child below 16 years could not give consent for internet companies to collect and store their data. This law has been described as ‘one step further’ than COPPA with much of the GDPR applying to adult personal data as well. This child-friendly regulation allows member states to set their own data age of consent and most notably, the U.K has established it as 13 years to align with COPPA, however, there are some exceptions whereby states such as Spain and the Netherlands have set it as 14 and 16 years of age respectively. GDPR states that commercial companies must take reasonable measures to ensure the child in question is above the minimum age. An example of this is having an age required field when creating a social account. The U.K. is now part of the UK GDPR which incorporates the requirements of EU GDPR with the 2018 Data Protection Act (DPA). There are limitations in how users verify their age on social media, and this is perhaps evidence of the initiative being government-led rather than industry-led. Historically, social media companies have supported age limits and at times lobbied for tighter restrictions on their platforms (The Guardian 2021). However, there may well be incentives for social media companies to allow governments to take control and set these restrictions, and there is evidence of Facebook spending £9.5m lobbying for restrictions against themselves (The Guardian 2021). Simply put, as an organisation adult data is more valuable than child data, and supporting these restrictions presents a positive brand image.

The American Academy of Paediatrics (AAP) spokesperson Gwenn O’Keeffe (2011), cautioned parents around the dangers of social networking even after the age limit. ‘It’s not a good idea. Since logic and sophistication reasoning does not kick in until high school, younger children may not realise one of their posts is inappropriate’. The quote supports the narrative many parents adopt in discussions of young people online (O’Keeffe 2011). Broadening social
connections becomes an insufficient argument for parents and educators when exposed risks include cyberbullying, sexting, and ‘Facebook depression’.

In contrast to this, Longfield (2018) argues in a more recent editorial that children aged 8-12 years consider social media fun, and stimulating and that this helps build relationships during digital tasks. The report continues to argue that those who feel marginalised by disability, migration or sexuality are introduced to a broader selection of peers, thus benefitting their social well-being. Furthermore, the use of social media for personal and health issues is on the rise (Househ, Borycki and Kushniruk 2014) with newer research now showing evidence of social media having other perceived benefits such as improved motivation, enhanced self-efficacy and development of leadership qualities (Househ, Borycki and Kushniruk 2014; McLaughlin and Sillence, 2018). Of interest, public social media profiles allow individuals to share and receive emotional support, acting as therapy for social-emotional outcomes. Moreover, Lindly et al. (2022) argue that social media can reduce persistent health inequalities for children. In other words, in children where emotional support is limited at home, social media can decrease the gap with those who receive positive emotional support.

Additionally, children may benefit from an awareness of nutritional information online, as medical professionals are considering the physical benefits of social media. Mendoza-Herrera (2020) found that children and young adults share recipes and healthy eating advice on social media. Similarly, an initiative that promotes healthy lifestyles may reduce the widening ‘nutritional gap between rich and poor’ (Klassen 2018).

Nevertheless, according to the National Society for the Prevention of Cruelty to Children (NSPCC), not enough is being done to tackle cyberbullying (BBC, 2012). Whilst a certain amount of blame can be directed towards governments, arguments can certainly be levied at ‘neutral’ social networking sites and their avoidance of taking responsibility for ensuring that social networking is as safe as possible for young people.
It can be argued that in recent years there has been a blurring over what constitutes hate speech and what should be allowed under the right to freedom of speech (Enarsson and Lindgren 2018). However, it must be acknowledged governments and even higher educational (HE) institutes grapple with this modern-day conundrum (Enarsson and Lindgren 2018). In addition to social networking sites, policymakers, and influencers of policy, i.e., government, schools and activists have failed to educate young people on how to become safe online and use social media appropriately. Children at 13 years are opened up to the digital world without any pre-teaching at primary level and this is risk appetite. Within schools, there is an abundance of information available to children on the risks of smoking, drug, and alcohol abuse, nevertheless, an absence when it comes to social media (Gonzales 2017). Gonzales (2017) proposes that schools cover topics such as digital footprints and the permanency of online content, and recommends ‘Common Sense Media’, which provides lessons as well as resources for classroom teachers. ‘Natterhub’ is another organisation that focuses on empowering young people to thrive online by educating them on digital citizenship and online safety. Their unique selling proposition is that they provide lessons and resources that focus on social media literacy, including: how to navigate a digital world, the importance of digital relationships and empathy and developing communication skills.

As children mature, social media holds the potential to become increasingly relevant in education. Students can connect with each other digitally using platforms such as WhatsApp and Facebook groups to consolidate learning. Pappas (2016, p. 3) examines this further and concludes that, in such situations, ‘small groups with not too many members’ are optimal for learning. This is essentially the consequence of members in the group feeling confident alongside having a sense of privacy that is deemed appropriate. Furthermore, Teoh (2022) reveals that professionals in healthcare are using social media groups for the acquisition of new ideas, to reinforce knowledge, to adjust existing knowledge, to learn about resources, and for
career advancement. Teoh (2022) argues that social media can mediate learning but calls for tangible guidance and platform-specific examples to maximise these potential opportunities.

Research on study skills and associated learning processes suggest that social media may benefit students in a pedagogical sense (Thompson 2017; Veletsianos and Navarrete 2012). Alongside these findings, it was once argued that students enter universities as ‘digital natives’ with an expectation that social media is integrated into all their experiences (Prensky 2001), however, discourse has somewhat shifted from the digital ‘native’ and ‘immigrant’ language (Helsper and Enyon 2010). With such demand on HE institutes, it is unsurprising that many embrace social media within pedagogical practice. Freberg and Kim (2018) found teaching faculties use social media for professional reasons at least once per month. Further studies are finding social networking goes beyond facilitating class connection and that this can hold the potential to enhance learning (see Tess 2013; Kinsky, Freberg, Kim, Kushin and Ward 2016). Facebook groups, for example, may be influential for supporting student engagement with mass lectures by facilitating a discussion of course material (Bowman and Akcaoglu 2014). Although, it is now becoming common practice for academic staff in HE institutes to engage with social media, it has not been without resistance. Expanded workdays, privacy concerns, and classroom culture are reasons why faculties often have hesitations about the implementation of social media (Pearson Learning Solutions 2013). Michael King (2015) describes the importance of HE ability to adapt:

The speed of technological innovation and industry demands is moving faster than higher education’s ability to adapt. The system continues to focus on lectures and exams, leaving students underprepared to enter today’s workforce. They’re suffering as a result—along with businesses and higher education institutions themselves. How can we expect students to be effective and successful employees when we’re using outdated models to prepare them? (Para. 2)
1.2.2 Distinguish factors that influence teacher engagement with social networking sites in their pedagogical practice

Social networking services (SNS) are some of the most popular internet services in the world. In 2020, Alexa ranked YouTube #2, Facebook #3, Twitter #12, and Instagram #13 as the most popular sites in the world. Facebook has over 2 billion users from around the globe (Fatehkia, Kashyap, and Weber 2022). Advances in technology, such as continuous innovation in smartphones, have created avenues for people to access SNS at any time and any place. In professional contexts, industries such as retail are taking advantage by using social media to reach clients/customers.

Furthermore, social media has been thought to inform employers in recruitment decisions with 94% of recruiters using social media to further understand a candidate’s ‘natural habitat’ (The Economist 2021). However, the extent to which they rely on these channels appears to range from informal checks to direct messaging. SNS offer a wide range of communication strategies to reach out to others and this has been viewed favourably by organisations with enhanced consumer engagement goals (Kacker and Perrigot 2016). Dealing with customer queries, promoting offers and sharing information are new methods that have contributed to an increasingly modern, measurable customer relationship, that companies seek.

Conversely, the education sector is presented with an increasingly complex critique when social media has been incorporated into classrooms (Landson et al. 2015; Junco et al. 2012), and this is despite many adults, including teachers routinely using SNS outside of their profession. Schools omitting to teach how to use a tool that yields over 70,000 job vacancies at any one time is perhaps questionable (West 2017).

Vasek and Hendricks (2016) argue that the United States (U.S.) have embraced social media as a pedagogical tool that enriches the traditional classroom curricula. Technology savvy educators use social media and other internet-based tools to expand the learning space beyond
the classroom and encourage student creativity (Papandrea 2012; Tarantino, McDonough, and Hua 2013). Blessing, Blessing, and Fleck (2012) refer, for example, to an activity where pupils are given a historical figure to research and are tasked with creating their Twitter profile and tweeting as if they were in the present day. Otchie and Pedaste (2020) suggest that learners can benefit from both subjective specific knowledge skills, and social skills when social media is embedded in pedagogy. As part of classroom management, for example, a teacher may monitor students’ activities on a platform and provide guidance and feedback when needed as part of subjective knowledge skills. At the same time, students will also ascertain how to regulate their own learning and build groups and networks together.

However, when social media is available for student-teacher interaction, there are associated risks. In other words, there is a possibility of using social media in inappropriate ways (Papandrea 2012). Vasek and Hendricks (2016) suggest some communication between teachers and students resembles that of a ‘peer to peer’ relationship. Policymakers are charged with the difficult task of balancing the implementation of social media strategies in classrooms alongside managing teachers access so that it aligns with the education agenda. In the U.K., many schools and academies have a zero-tolerance policy towards mobile devices and SNS in classrooms, preventing any such creativity by teachers. Ingleby, Wilford and Hedges (2019) discuss the challenge educators face in making pedagogy ‘creative’ alongside providing ‘deep learning’ outcomes.

Gao et al. (2017) argue that teachers can consider that the disruptions significantly outweigh any benefit a mobile device/social media might add to the classroom. Speaking generally, Technology Enhanced Learning (TEL) is increasingly more complex than first imagined. HE presents an alternative story with academics within institutes being increasingly accepting of digital teaching methods. As an example, Landson et al. (2015) adopted various social media strategies within the classroom, investigating the engagement rate in university
nursing students. Some strategies included setting tasks on Twitter with students having to complete the task in a 140-character tweet. Results demonstrate that when tasks are put on Twitter, the engagement rate is 95%. However, these tasks were set during lectures, therefore, it is only to be expected that students who attended would engage with the tasks. Nevertheless, exploring the engagement rate when tasks are set outside of the learning environment is arguably worthwhile for teachers as they consider how to set homework tasks.

1.2.3 *Determine, using a mixed methods approach, whether or not social media engages students and enhances academic performance and the degree of which this is compared with traditional teaching methods* 

Kolb (1984) is associated with experiential learning in education literature, and he is associated with ‘four types of abilities’, that is: Concrete Experience ability (CE), Reflective Observation ability (RO), Abstract Conceptualization ability (AC), and Active Experimentation ability (AE). It is argued by Kolb (1984) that optimal learning can sufficiently take place when a learner possesses all four abilities. This constructivist view of pedagogy states that all four abilities are equally important, which is in disagreement with Piaget’s (1978) argument that intention is a superior cognitive process. Looking at current teaching methods across Europe, it can easily be argued that a hybrid combination of comprehension and intention produces higher levels of learning (Abdulwahed and Nagy 2009). This pedagogical model of learning is consistent with contemporary teaching methods (for example, as in Plett et al. 2006, with their trial course: introduction to robots). Twitter is gaining popularity in academic and conference arenas as a way to increase participation engagement, attention, and interaction (Bristol 2010; Junco et al. 2011; Lepi 2013; Nomura, Genes, Bollinger, Bollinger, and Reed 2012 cited in McKay et al. 2014). Astin’s (1999) definition of engagement includes ‘greater involvement in the course’, in other words, the argument that when students are actively involved in psychological and physical experiences their learning will be enhanced.
McKay et al. (2014) studied Twitter as a tool to enhance student engagement outside of classroom settings. Analysis undertaken on Hootsuite™ yielded a total of 289 tweets per conversation starter on the social media platform, and this is higher than the number of students on the course (n = 220). Despite generating many responses, 49% of students strongly agreed or agreed that Twitter was an engaging tool away from the classroom. The reviews by students were primarily the result of the task resulting in a more extended working day of 11.8 hours and a lack of training on this type of social media. Many students were first time users of Twitter, thus necessitating extra learning on their part. McKay et al. (2014) failed to use a pre-validation tool to measure students’ or faculty views of the ‘acceptability’ on Twitter, and whilst this study does contribute to the growing evidence that Twitter may enhance engagement in education, a mixed methods approach would’ve been able to capture ‘behind the scenes’ conversations on Twitter to effectively promote engagement (McKay et al. 2014).

Tess (2013) describes the potential social media has to ‘enhance the learning’. Using Twitter as an educational resource to benefit the learner can be broken down into two concepts, informal learning, and formal learning. Informal learning provides an opportunity for students to engage with learning outside the classroom, such as making a decision to follow and interact with leaders in a subject area on Twitter (Freberg and Kim 2018). Formal learning refers to a much further integrated approach to SNS with consideration of the notion that most employers want their workforce ‘social media ready’. HE, for example, frequently encourages students to participate in informal learning as a way of networking with academics at other institutions.

Classrooms provide learning spaces for children, which by themselves are a teacher’s most important learning tool. A teacher can often dictate how their learning space is arranged, for example, displays, cabinets, shelves, and seating arrangements. Despite this autonomy, pupils will either be arranged in clusters, U shaped or in rows. Teachers will then begin speaking with
children having pens to hand and books open ready to learn. Literature which goes back as far as the 1950s presents an almost identical classroom experience for pupils. Classroom layout has remained stable despite attempts for educational reform (Herman, Van Gorp, Simon, Vanobbergen, and Depaepe 2011 as cited in Tonduer et al. 2014).

Interestingly, the speed at which the technological revolution is taking place is a phenomenon. The advancement of technology such as Interactive Whiteboards (IWBs), computers and tablets can influence the educational space and practice, as identified by Brooks (2010). More recently, teachers have immersed themselves in technology by using virtual and social platforms and online lessons (Radianti et al. 2020). Nevertheless, the evaluation of the technologies have primarily been focused on the usability of the resource instead of the learning outcomes, and this reduces the effectiveness in respect of transformative pedagogy.

Additionally, teachers frequently do not have an opportunity to fully integrate technology in their classrooms and they may be left with inadequate resources. Turbill (2001, p. 175) writes that ‘One computer in a kindergarten classroom is about as useful as one container with three pencils when I have 27 children in a room’. In many cases, new technology has been adversely affected by inadequacies in the infrastructure, so it is unable to influence pedagogical practice effectively. Virtual and hybrid teaching have been presented with similar administrative and structural challenges whereby resources such as iPads and data plans are unable to be allocated to every learner (Potts 2020).

A number of scholars argue that educators and related professionals have a particular responsibility in teaching young people how to deal with new media, including social media (Livingstone and Brake 2013; López-Varela and Zepetnek 2008; Martens as cited in Vanwynsberghe and Verdegem 2013). However, this also raises the question of how social media could be integrated in the educational setting and how the success of this integration
could possibly be measured. To help in understanding this phenomenon, it is essential to examine previous studies. In Landson et al.’s (2015) study, which investigated the pedagogical engagement rate of 300 nursing students, the strategy was to promote active learning and a student-centred classroom. Initially, students were asked to complete the following sentences in a tweet during one of their learning sessions: My impression of health care disparities is...; A health care disparity theme that I am taking home today is....; A personal experience that I have had or know of with a health care disparity is.... These tasks did not contribute to a pupil’s assessment grade; however, the engagement rate was very high at 95%. Landson et al. (2015) compares this to previous tasks set on Moodle (a popular HE learning system) and stated the results are increasingly ‘positive’.

Interestingly, during the assessment task, students watched a video and followed the Twitter format (140 characters) to reflect on nursing and caring. Upon evaluating the study Landson et al. (2015) concluded this format as a teaching tool is useful in gaining an insight into the students’ comprehension of the material. Students engage with the social media tool and as a format for assessment, Twitter can be used to measure students’ comprehension.

1.2.4 Design a framework for teachers to follow when implementing social media strategies in the classroom

The workload of a classroom teacher has increased over the last decade, nevertheless, the expectation that new practices are implemented in their pedagogy may become increasingly prevalent as their perceived responsibility for student results increases (Runhaar and Sanders 2015). Hence, many teachers are encouraged to share best practices with departmental colleagues using shared drives and/or a bank of resources. This often reduces planning time as teachers can access lesson plans and class materials from previous years’ applications of a specific topic. However, as has been reported, this can lead to criticisms from teachers (as in
Runhaar and Sanders 2015). In schools, teachers have long been used to working autonomously and in isolation, which can impede interaction (Silins and Mulford 2002) and consequently, this prevents teachers learning from each other in helpful ways. It is argued that if teachers do feel empowered through sharing best practices, the skill level of that teacher increases (Runhaar and Sanders 2015). TEL has frequently delivered a dilemma for educators through the whole education system. Despite pushes from the UK governments from 1979 onwards, and in particular, increased education funding throughout the Blair years (1997-2007), the pedagogical needs of the teachers and the learners have not always been met (Ingleby, Wilford and Hedges 2019). It is argued that forms of TEL, such as making use of social media, hold the potential for innovative learning, however, the teachers and the students may first require training in its use. Nevertheless, teachers may not be willing to pursue this innovative pedagogical strategy since the accountability for and responsibility for student results tends to become a key focus of the UK teaching profession (Ingleby, Wilford, and Hedges 2019).

It is argued that one of the reasons teachers are not using social media in their learning is a lack of knowledge about how to implement the use of technology effectively (Dennen, Choi and Wood (2021). With such uncertainty around the application of social media strategies, teachers may feel less confident in using social media for pedagogy. Practical considerations may additionally limit the application of social media to pedagogy (for example, questions around which devices to use, and special educational needs (SEN) considerations).

In this research, I argue that the importance of this study goes beyond providing guidelines for educationalists on how to use TEL for pedagogy. Baudrillard (1983) characterizes the modern world as nothing more than a script, seeking to examine the relationships between reality and society. In his analysis of Disneyland, Baudrillard (1983) describes the commodity as a symbolic value and significant to construct a perceived reality, and that over time becomes truth in its own right. The concept of making the imaginary world ‘real’ and hyperreality, or in

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other words, more real than reality itself has implications within the escapism idea of social media. Twitter, for example, creates a ‘make-believe world’ that manipulates opinions and ways of thinking, and a Twitter profile often makes people liable for their posts, influencing tweets but restricting a complete mirror image of that person. Once particular views are shared, they snowball and gather momentum addressing specific issues. Although initially the concept of ‘fake reality’ can be perceived as unfavourable, in respect of classroom learning it can be argued that social media holds the potential to break down barriers in relation of accessibility to the curriculum and literacy skills, in addition to other social barriers (Reeves 2017).

1.3 Methodological approach

I have approached this thesis from a quantitative social science background, and a significant part of the thesis focuses on attempting to establish facts and look for causality. With reference to Guba’s (1994) research paradigms, a post-positivist paradigm has been adopted enabling the use of a mixed methods perspective with a critical realist ontological approach in developing this research.

Chapter 2 of the thesis provides a thorough understanding of the role technology has with pedagogy, illuminating the relationship between social media and teaching practice. Chapter 2 will critically investigate existing studies which have implemented TEL, distinguishing factors which relate to teachers using social media as a classroom resource. The chapter discusses the relationship that exists between personal development and TEL, and how technology policy impacts teaching practice. In a comprehensive exploration of the impact that social media has on student performance and engagement, Chapter 3 will outline the methodology that informs this study. The chapter content begins by presenting anonymous information about the participations taking part in the research and the content then outlines the mixed methods approach that has been used for the data collection process. Finally, Chapter 3 considers research ethics and GDPR law. GDPR aims to give individuals control over their personal data
by modernising laws on how private and public bodies handle personal information. The mutually agreed law came into force on May 25\textsuperscript{th}, 2018 (now referred to as UK GDPR) and this has had an impact on the customer data SNS pass on to advertisers, thus affecting user experiences. Chapter 4 presents the data that has been gathered from each phase of the data collection process as well as reveals the key research themes. The main findings are linked to the TEL literature, for example, Landson et al. (2015) in Chapter 5, and there is a detailed reflection on the implications of the PhD research pedagogy in this area.

This study is explored using theory from Vygotsky’s (1920) Zone of Proximal Development (ZPD) and Social Constructivism, alongside the application of sociocultural theory (Trowler 2008). Constructivism is a broad term that has been grounded in research by both Vygotsky and Piaget. One of the main ideas of social constructivism is that social interactions are essential for knowledge construction (Bruning et al. 2004). Vygotsky asserted that the development of individuals, including their thoughts, languages, and reasoning processes, is a result of culture. These abilities are developed through social interaction with others. In an environment of constrained resources and quality assurance efforts, institutions across the U.K. are now having to develop creative ways to link their pedagogy to 21st-century teaching. It is argued that over the last 15 years, American institutions have become better at preparing their students for employment by implementing contemporary learning strategies. This has included the application of Vygotsky’s theory about the ZPD (Murphy, Scantlebury and Milne 2015; O’Sullivan and Seabra 2020). The ZPD proposes that each individual has a developmental capacity and that anything above this capacity cannot be achieved. The difference between a learner’s actual development level and potential development level is called the ZPD. It is argued that the potential development level is determined through an educator’s guidance.

1.4 COVID-19
Coronavirus (COVID-19) is an infectious disease which causes people who are affected to experience mild to moderate respiratory illness. Older people can develop a severe illness if infected. COVID-19 spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes (World Health Organisation 2020). As the disease spread across the globe, individual countries have positioned themselves in a way they think is best to deal with a global pandemic. Countries such as Sweden have opted for a herd immunity strategy which aims for a sufficiently high percentage of the population to become immune to the disease, meaning a relaxed approach to any changes to an individual’s daily life.

In contrast, other countries including the UK have gone into ‘lockdown’. Whilst the specifics of a lockdown differ between nations (Scotland and Wales have different restrictions to England for example), the principle remains the same, movement control through enforced restrictions. The U.K, for example, went into lockdown on 23rd March 2020 when Prime Minister, Boris Johnson emphasised that ‘people must stay at home’ and ‘unnecessary social contact should cease’. Non-essential businesses shut, schools remain closed until further notice, and individuals were only permitted to leave the house once per day for daily exercise.

In this context, the global spread of COVID-19 and the subsequent lockdowns have resulted in schools being shut down all around the world. It is estimated that 1.6 billion students have been impacted due to the measures taken by the affected countries to stem the outbreak (UNESCO 2020). Amongst the chaos, the education technology and online learning sector are presented with the most significant opportunity with the rise of e-learning; whereby classes are conducted remotely and online. A similar opportunity was introduced across the workforce as business meetings, conferences, and other occasions where face to face meetings as required, were now terminated.

In education, some schools have managed to adapt to COVID-19 and continue with their teaching, however, others have not been able to do this. The University of Cambridge, for
example, announced almost instantly that their students would be attending virtual lectures with some blended learning planned for the 2020/21 academic year. Implementing remote strategies have been easier for some institutes like Cambridge than others, and this is primarily because of their ‘already in-place’ solutions for their extensive international student base. State schools and even smaller universities do not necessarily have an adequate education technology infrastructure to draw on, and this is in consequence of limited staff training on digital pedagogy, inaccessibility of devices, and inadequate experiences on platforms such as Microsoft Team, Zoom, and Skype.

The pandemic occurred and still is happening as I am writing this thesis. I published an article detailing the role education technology has played during the COVID-19 lockdown, and an extract is presented below to summarise how I have considered the impact of the pandemic on my research on TEL:

Notwithstanding the social, political, and economic factors that influence the use of ‘EdTech’, some technologies have played a crucial role in ensuring that learning providers (schools, colleges, and universities) deliver learning through means that resonate across generations. When I first began my doctoral research exploring how social networking sites can be implemented into pedagogy successfully, it was still an interesting yet undesired form of pedagogy for many educators. However, since COVID-19, remote learning has become the new normal for students and teachers with many of the widely known challenges being dilated. To ensure minimum disruption to education programmes, institutes recognised the importance of unlocking the potential of technology for effective remote learning. In other words, the pandemic has brought online learning to the forefront of conversations in education and in the commercial world.
Discussions around remote learning are pertinent in my experience of using social media in education. Many news outlets have even held institutions to account for their lack of contact with students during the lockdown with communication and mental health being key themes generated in this discourse (see Weale 2020; Winnie-Zhou 2020). I argue that social media plays a vital role in people’s lives, even more so during the lockdown due to the potential connectivity that is generated. There is evidence to suggest that social media can improve confidence, social wellbeing, and creativity in learners (Lewis 2017). 21st century learning sceptics have often cited cyberbullying and online abuse on social media platforms as issues which must be addressed before any serious discussions around social media in pedagogy can be held. However, during this period of enhanced remote learning terms such as ‘TEL’, ‘EdTech’ and ‘e-learning’ have appeared at the forefront of an education agenda, and social media abuse appears to be reducing (see Jardine 2020). Furthermore, Jardine (2020) argues that the crisis is helping educators to realise the positive benefits of using social media for pedagogy.

1.5 Anticipated findings

Social media presents virtual communities in which an exchange of content can take place (Hanzel et al. 2018). This often includes dialogue with friends and family and is part of Facebook’s wider goal of ‘giving people the power to build a global community for all of us’. Within this study, it is anticipated that the students and educators who are using social media networks will be accustomed to creating dialogues within virtual communities (for example tweeting their friends). There is also a likelihood of there being platforms that are viewed positively and contrastingly negatively in education technology discourse. The changing demographic of today’s students has led many educationalists to examine ways to make the constructs of learning more efficient (Evans 2014) and it is argued that technology has come
to be regarded as one of the modern tools that might be used to enhance learning (for example see Jisc and the Higher Education Academy 2009). The research that has already been conducted on social media in the U.K. has revealed that Twitter has great potential to enhance teaching and learning (Landson et al. 2015; Hanzel et al. 2018; Freberg and Kim 2018). The findings of Junco, Elavsky and Heiberger (2012) reveal that using Twitter can improve performance in tasks that involve assessment. Thus, it is argued that there will be the potential for students to enhance their learning processes when social media is used as an educational resource. This is compared to traditional methods which may not appropriately serve modern students as they are regarded as being disengaging as they can promote passive learning (Biggs 1999). There is a strong relationship between Twitter usage and student engagement (Dewan et al. 2019). Evans (2014) and Junco et al. (2011) reveal that when Twitter usage is high in classrooms, so is student engagement in pedagogical activities such as class discussions. Junco et al. (2011) likewise reveal that extracurricular activities such as involvement in a play are also enhanced when students are active on Twitter. This suggests that the introduction of Twitter may be a way to reduce the number of disengaged students. In the present study, it is anticipated that educators will view the potential of social media as engaging for students, thus enhancing the overall learning process.

Furthermore, education scholars (Atencio, Jess and Dewar 2012; Darling-Hammond et al. 2009) argue that there is tension relating to CPD and TEL, and this has been influenced by political, economic, and individual decisions. It is also argued that there is widespread agreement that effective CPD is an important part of educational success, therefore it is anticipated that this theme may arise in the social media and pedagogy context.

Historically, the implementation and application of TEL must fit around timetabling, curriculum, and school governance. In this instance, the term TEL could be viewed as an overgeneralisation, whereby some TEL products, in particular with new technologies such as
social media are used outside of the classroom and profession by the educator. This is in contrast to previous uses of TEL in the classroom, such as personal computers or calculators, which were primarily used in education and the general population at large. These insights indicate the complicated relationship between TEL and education, and it is anticipated that the term TEL could be perceived as problematic because of this.

1.6 Contribution to knowledge

The PhD thesis aims to address significant gaps within the current literature; and more specifically, the research will reflect on the potential of social media as a pedagogical tool. Few studies have made links between social media and pedagogy, moreover, in professional practice, the use of social media strategies has only recently become a pedagogical consideration; the global pandemic has certainly expediated conversations in this area. As social platforms enhance their functionality through continuous development, additional users are now actively engaging with sites such as Twitter on a multidisciplinary level. This is exemplified by the production of microblogs and ‘following’ experts in an academic field, and subsequently accessing a wider range of resources. Despite this, the direction of social media in the classroom remains unclear and contentious (Freberg and Kim 2018). The current research will illuminate potential future uses of social media by offering a framework for teachers and educationalists when using social media pedagogical strategies. Dennen, Choi and Wood (2021) outline multiple reasons why teachers are not implementing social media strategies in their pedagogy. These reasons include the adoption of the technology, personal beliefs, digital literacy, concerns around the effectiveness of technology for pedagogy, risks to health, and professional development. Prior to Dennen, Choi and Wood (2021), Fox (2013) also highlighted that accessibility for all learners remains increasingly essential for teachers.

Since this publication, further research has not addressed the issues mentioned above; thus teachers are still in need of an effective social media strategy for their pedagogy.
Pedagogy constructs a method composed of both teaching practice and academic concepts, and the last few decades has seen the definition of pedagogy vary in significant ways. In the 1980s, pedagogy was defined as an abstract utopia line that does not underpin the daily workings of a teacher (Ellsworth 1989). Modern-day researchers and academics view pedagogy as a critical education movement that in principle helps teachers develop their practice (as in Giroux 2017). Despite a contrast in definitions, a reoccurring theme from studies throughout the last few decades is that there is an invisibility of theoretically informed pedagogy in centralised education (see Lusted 1986; Ladwig et al. 2007; Giroux and Shannon 2013). It is argued that some authors have not used their research results effectively to support the application of the findings for practitioner development/teaching practice. Kagan (1994) is a noticeable exception to this rule and frequently investigates collaborative learning, providing scripts, lesson plans and frameworks for teachers to follow. In Kagan (1994), there is a clear pathway of research informing pedagogy. The framework developed in this study will add to the literature, filling the modern-day gap between pedagogy and teaching practice. Teachers’ perceptions of a teaching strategy can dictate how well it is performed. It is hoped that by providing a framework for teachers, their confidence in using social media strategies will be enhanced, promoting multidimensional thought which can be useful in generating theories about pedagogy.

Furthermore, vulnerable children (VC) are at high risk of neglect and a lack of appropriate care, and this group of children can include refugees, orphans, and those who grow up in poverty. Many VC have disrupted educational experiences, and this results in them missing out on opportunities. Often, social workers will suggest local schools are in a favourable position to make VC feel welcome, and protected and implement any interventions (Stafford 2018). Dr Frazel (2018), a child psychiatrist from the University of Oxford, reflected that: ‘there are no natural ways for these children to build a social network with them thinking it has
been engineered’. In the classroom, the simplest activities become difficult for the teacher as they must consider that VC may have language barriers, they are exceedingly likely to have mental health needs (Stafford 2018), and they are increasingly expected to fall behind in their learning. TEL, such as social media, can help break down the barriers VC frequently face in classrooms. Gleason et al. (2019) argue that social networking companies underwent a design revolution to remove barriers that prevented people with disabilities from using social spaces that have become deeply ingrained in society. Some of these included videos with captains (which are essential for people who are deaf or hard of hearing) and images without alternative text (descriptions read aloud by screen readers who are blind), yet there remain challenges in learning for individuals with motor impairments.

The Financial Times (2018) published an editorial which told the story of a boy aged 10 diagnosed with brain cancer. Cancer limited the boy’s mobility, meaning he was not well enough to attend school. Advancements in technology meant the boy could access the curriculum whilst at home using an iPad, watching the lesson, and communicating with the teacher using a robot and live chat. The school Principal said the boy did not fall behind in any of the work and could keep in touch with friends. Many scholars argue that social media could act as a way to bridge curriculum accessibility and literacy gaps (Landson et al. 2015; Gleason et al. 2019).

Despite some research now exploring the impact Twitter and other social networks have on students’ engagement in classroom settings (for example see Evans 2014; Junco et al. 2011; Junco et al. 2012), none have investigated engagement rates when tasks are set at home. Generally, engagement of young people on social media is high (see McArthur and Bostedo-Conway 2012). Landson et al. (2015) investigated engagement rates within classroom settings and discovered a 95% engagement rate if social media is included within pedagogy. Industry experts such as McKay et al. (2014) found student engagement levels differ away from
classroom settings, and this is magnified when learning through social media platforms such as Twitter. The drop in engagement levels may be due to inaccessibility of the curriculum, and/or inefficient application of technology with pedagogy (Dewan et al. 2019).

This research will complement the findings of Landson et al. (2015), Evans (2014) and Junco et al. (2011, 2012) who reveal that using social media can also enhance homework. In addition, several previous papers have used HE students as research participants (see Landson et al. 2015; McKay et al. 2014; Fox 2013; Freberg and Kim 2018; Tess 2013; Bowman and Akcaoglu 2014; King 2015). However, as this study is based on secondary school students, the findings will add to the research literature in this area of pedagogy. References to HE are purely contextual and are used primarily to provide further insights in general into TEL activities.

Education frequently makes the news headlines in the U.K, and much of the spotlight draws on the same mix of pledges that the policymakers announce. Examples include interventions with school meals, University tuition fees, teachers’ pay and returning to a grammar school system. An investigation by The Telegraph (2010) found no evidence of strategic thinking in policy pledges. This opened up a campaign with headteachers urging that schooling should no longer be micro-managed by Westminster, instead by experts in education, in other words, the practitioners themselves. A follow up survey by The Telegraph seven years later found the situation had worsened and there was further intrusive bureaucracy and ‘meddling’ by those outside education. This overview confirms there is an absence of effective pedagogy that is informing political decision making in education in the UK. By identifying how technology can promote effective pedagogical practice, the study will contribute to the broader educational policy agenda and also illuminate the specific gaps that relate to TEL.
CHAPTER 2 - LITERATURE REVIEW

The following chapter comprises of four parts. The first section examines technology enhanced learning (TEL) by reviewing the historical relationship between technology and education. The pedagogical approaches relating to TEL are also discussed in this chapter, along with the complications that are associated with TEL. The challenges and opportunities of using social networking services (SNS) in education are also identified. The second section provides an academic critique of the relationship between education and the state, specifically, the social, political, and economic factors that influence TEL. This section likewise considers TEL in an international context, examining how different political ideologies can impact the success of implementing TEL in classrooms. The third section attempts to understand the context in which educators operate, and make sense of the challenges related to continuing professional development (CPD). To fully explore this phenomenon, personal development (PD) frameworks are explored, with a specific focus on Aileen Kennedy’s 9 typologies of CPD. The final section will explore ideas using socio-cultural theory (Trowler 2008), the six propositions that can summarise the complexity of the theory, and this links with Vygotsky’s Social Constructivism which includes social interactions being essential for knowledge construction. Trowler’s (2008) socio-cultural theory is instrumental because it considers how PD and social factors impact the learning and teaching of TEL.

The literature within these sections has been sourced from a range of highly ranked international journals, such as Computers in Education, Educational Technology Research and Development, Internet and Higher Education, and Educational Technology and Society. These journals were sourced based on the SCImago Journal Rank Indicator (SJR), which measures a journal’s impact, influence and prestige, and the Impact Factor (IF). The SJR expresses the average number of weighted citations received in the selected year by the documents published in the previous three, and in this case, journals scoring above 0.8 were used. Similarly, IF...
measures the average number of citations per year, and journals with 1+ the IF influenced this chapter (Gann 2017). Nonetheless, I also took into consideration the general debate about the validity of IF as a measure of journal importance as it cannot be used for comparison between disciplines, in other words, education and technology.

2.1 Technology enhanced learning (TEL)

The use of technology, particularly digital technology, is an integral part of education, yet making sense of TEL is not a straightforward task (Selwyn 2016). TEL has typically delivered a dilemma for the education system (Ingleby, Wilford and Hedges 2019). Discussions around education and technology frequently present identical themes, for example, obvious practical limitations and a shortfall of potential benefits (Selwyn 2016; Gao et al. 2017; Fox 2013). Unfortunately, this can mean that further thought must be applied to enabling TEL. However, in the ‘digital age,’ it is possible for niche technology products to rapidly become a mainstream feature of day-to-day life. Smartphones, for example, are now accessed by billions of users around the world. Many people will use this technology to arrange meeting up, to Google an answer or use the Global Positioning System (GPS) to find their way around. Selwyn (2016) describes this technology as ‘a modern solution to mundane problems’. Digital technologies are transforming societies and are at the core of how people communicate and consume information. Therefore, it is reasonable to expect that educators are thinking about TEL and that education can benefit from TEL via technology-informed pedagogy. I contend that researchers and practitioners ought to be mindful of the potential that technology holds for education.

One particular benefit of TEL is an increasingly efficient and inclusive way of delivering information, going beyond the traditional ‘four walls of the classroom’ (Campbell 2015). Scholars have welcomed TEL in widening access to education and allowing greater participation than previously possible (Gleason 2019). The benefits to pedagogy are well-
defined in the literature, and researchers are in agreement that digital technology is essentially a good thing for education (Freberg and Kim 2018; Selwyn 2016). This is why educators require the prompt integration of digital technologies in schools. As Barack Obama (2014) stated, ‘we expect free Wi-Fi with our coffee, and we should demand it in our schools’. Although radical changes in education are not always possible, Dan Lortie (2002) argues that ‘Education does not change at a rapid pace- the major constructs of public education are much the same today as 30 years ago’.

2.1.1 History of TEL

Looking back at the history of education and technology acknowledges issues and factors that can only be revealed with the benefit of hindsight (Cassidy 1998 as cited in Selwyn 2016). The historical development of TEL can provide educators with possible ramifications and/or frameworks new technologies seek. Social Networking Services (SNS), Virtual Learning Environments (VLE), Artificial Intelligence (AI), amongst others, can only have a sound understanding if the processes influencing TEL are examined.

Direct links between education and TEL are long-standing, especially in ‘numeric’ uses of computers (for example, pocket-sized calculators). HE institutions had begun using computers for teaching and learning as well as for research and administrative purposes in the early 1960s (Selwyn 2016). As the 1960s progressed, the use of computers in ‘non-numeric’ forms such as tutorial and coaching instruction became popular and the term ‘computer assisted instruction’ was heralded by the philosopher Patrick Suppes. Computer tutors, where a computer presents material to a learner and asks questions about it, ensured the equitable future of educational provision, allowing everyone access to top-quality teaching and learning (Suppes 1966; Martin and Norman 1970). Additional developments in TEL during this period included, drill and practice instruction, problem solving, dialogue systems, computer laboratories, database use, and educational games (Martin and Norman 1970).
Between 1950-1980, the U.K government supported applying technology to pedagogy. This is evidenced through sustained government investment in educational technology (see Jones, 1980 cited in Ingleby 2016). In this period, all the developments listed above, spread across schools and educational institutions across the country. The ‘Technology’ writer Christopher Evans (1979, p. 18), correctly predicted ‘portable, personal teaching computers will sweep through the education system in the western world’. Educators became enthused with a direction towards computer assisted learning as it encouraged critical thinking and creativity, which also matched the perceived learning styles of pupils at that time (Martin and Norman 1970). This was a remarkable period in Western education as schools who had formally been instructor-centred moved towards a heavily student-centred approach. Whilst schools enjoyed the benefits of TEL, a second reform was needed to make computers readily available to all pupils. This began in 1979 with new policies by Margaret Thatcher’s government to increase the use of technology within the education sector. For example, the National Council for Education Technology was established and up until 1991, computers in schools rose from 18 to 98 percent. Similarly, the ratio of students per computer dropped from 125:1 to 18:1 (Selwyn 2016). However, the astronomical rise in the availability of TEL was not supported with parallel computer education for teachers. Research studies in the late 1990s found issues with teacher expertise and confidence with computers (such as Conte 1997); teachers were not TEL ready. Conte (1997, p. 23) argues ‘in many schools computers sit idle much of the time or are used for passive learning routines rather than being used to cultivate higher-order thinking skills like synthesis, analysis, and communication’. Despite the technology changing from computers to tablets, these issues still wait to be addressed (Oliver 2016). The small-scale work by the government from 1997 onwards has impacted the emergence of social media in classrooms. Theoretically, through the commercial competitiveness of Information Technology (IT) companies such as Apple, Microsoft and
IBM, the last 10 years have been the opportunist time to enable our classrooms with new technology.

The last 60 years have demonstrated some important ‘lessons learned’ for successfully managing the rise of social media. Technological remedies and quick technology fixes, for example, cannot be assumed to integrate within the education system without ‘social engineering’. Social engineering is a concept Alvin Weinberg first mentioned in 1966 when discussing ‘clashes’ of TEL with structures of education, in other words, the curriculum. Essentially, there is no reason for teachers to use TEL if the curriculum does not reflect the changes in practice and this is why implementing technology in classrooms can be problematic (Cuban 2013). However, it would be unfair for teachers to be solely responsible for limited showings of technology in education provision and practice (Selwyn 2016). TEL has to fit around examination regimes, timetabling, curriculum, and formal and informal governance of schools. That being said, it would be naïve to assume the new wave of technology, social media, will repeat high profile failures of TEL in the past (Oppenheimer 1997) and there is a suitable reason to expect this can perhaps be ‘the one’, as many educators use SNS outside their profession. It can be argued that this is something which was absent in the 1990s with microcomputers.

The recent Conservative Party Manifesto argues that ‘world class public services are equated with ‘technology’ (Conservative Party Manifesto 2017, p. 4), hence, the current government’s commitment towards continuing to invest in TEL. The importance of this support cannot be underestimated, and West (2017) claims SNS now yields over 70,000 jobs at any one time and that omitting this tool in education is highly irresponsible. Almost all industries including corporations, non-profit and government organisations share the need for employees to have social media expertise (see Freberg and Kim 2018).
2.1.2 Pedagogical approaches to TEL

There are a growing number of educationalists and psychologists who have turned their attention to understanding the influence social and cultural environments have on an individual’s learning and cognitive development. Much of this thinking relates to Vygotsky’s earlier work and the development of the sociocultural theory (Trowler 2008). The notion of learning as a collaborative process has found resonance with teachers working in TEL (for example Luckin 2010). Bracken and Lombard (2004) argue that many people treat technology in complex ways, including interacting with digital devices as if the technology was ‘more able and more knowledgeable for them’. Examples of this include wikis, blogs, SNS, and other online workspaces. There are a number of large-scale studies that conclude TEL improves learning performance (such as Landson et al. 2015; Pappas 2016; Mckay et al. 2014) and there are a number of ways TEL can support and enhance the work of a teacher. Teachers are now using digital technologies to provide support for planning, enhancing subject knowledge, and developing professional capabilities and skills (Henderson and Romeo 2015). In a pedagogical sense, there has been a heavy push on classrooms to use technologies such as interactive whiteboards and clickers. This diversifies the opportunities for teachers to deliver their information and allows the teacher to arrange multiple learning experiences. Selwyn (2016) describes the emergence of these applications as support which has allowed the teacher to switch between individualised, communal, teacher-led and/or student-driven forms of pedagogy.

Teachers face a conundrum when using TEL, despite the praise they may receive when classrooms are successfully ‘tech enabled’, they are additionally held responsible when technology fails to be embedded in pedagogy. Biesta (2016) argues that teachers should not go and become the ‘extreme non-directive facilitator’ because ‘interpretation and comprehension cannot be simply facilitated’. It can be argued that TEL needs leadership and governance,
although an authoritarian model is no answer. A popular model that is followed is Puente

dura’s (2013) SAMR model which describes four possible levels of TEL. The first levels are ‘Substitution’ and ‘Augmentation’, these levels enhance the current teaching style and change what the teachers and students are engaged in, such as interactive whiteboards. The following two levels are ‘Modification’ and ‘Redefinition’ which are transformations in the classroom and allow teachers to complete tasks they were unable to do without the technology, such as SNS. In contrast, educators may follow Moersch’s (1995) Levels of Technology Framework (LOTI) which consists of six levels, ranging from ‘No Use’ (Level 0) through to ‘Enhancement’ (Level 5) and ‘Refinement’ (Level 6) (Moersch cited in Mehta and Hull 2013; Selwyn 2016). A key concept of LOTI is that the teacher focuses on the learning outcomes and students have the autonomy to control how they learn and which resources to use. This is often experimental and risky and some of the critics often cite LOTI as requiring huge teacher preparation and provide inaccurate measures of assessment (Mehta and Hull 2013). Pappas (2019) argues that there can be a lack of a digital divide between students as all members have equitable access, and both models are inclusive by providing a sufficient outline for teachers to take when fitting TEL in their classrooms. It is also argued that the models are not hierarchical and at times ‘No Use’ may be well suited for learners as opposed to ‘Enhancement’. In similar respects ‘Substitution’ may be more appropriate than ‘Modification’ for mainstream users (Roger 1995). However, it can likewise be argued that SAMR and LOTI are in fact hierarchical as ‘Redefinition’ and ‘Refinement’ suggest a preferred state of working.

Hamalainen and Wever (2013) conducted a study which explored teachers’ and students’ interactions in TEL settings. A designed based research methods approach was used to combine instructional approaches of TEL with theoretical knowledge from collaborative learning. The authors used a 3D game which used RealXtend Technology to create a VLE. Students played the game and conducted tasks in various interprofessional roles such as cooks, waiters, and
receptionists. The tasks were designed to measure problem solving, coordination, information processing, reading skills and group work. The findings illustrate that teachers apply different discussion activities when using TEL than in traditional classroom settings without TEL. In detail, the types of discussions identified changed from ‘knowledge-providing’ to ‘joint problem solving’. When compared to traditional classrooms, TEL enabled the teachers to focus on empowering learning processes instead of managing the flow of the classrooms. Teachers were not responsible for introducing, selecting, sequencing, and concluding activities, as technology orchestrated the learning (Dillenbourg 2012). Thus, it was concluded that new technologies enable teachers to better evaluate progress of student learning processes.

Educators must consider how they apply and integrate TEL as certain practices may be perceived as old fashioned (Crompton et al. 2016 cited in Wilford 2018). Readily available devices such as laptops in a classroom may not be seen as ‘revolutionary’ anymore by pupils, and this results in the focus being shifted to the pedagogy of TEL. Interesting debates are now discussing if TEL should shape pedagogy, or if pedagogy should shape TEL, with pedagogy being seen as the framework or ‘driver’ and technology becoming as an ‘accelerator’ to this pedagogy (Renwick 2016). Moreover, scholars have argued that most of the learning now takes place outside the classroom and technology is a key part of the access to learning that designing, and planning lessons used to be. Renwick (2016) provides an example of how learning has evolved:

Kids can write computer programs with coding applications. They can also construct original worlds in Minecraft. There are often no directions provided. Students have to figure it out on their own. When they cannot, they will usually connect with their peers and collaborate within their digital constructs. By providing some access, we increase the possibilities for new learning
However, it is important to consider that technology is unable to become the driver in all educational situations, and in reality, students often do need instruction on how to use digital tools for learning. For example, students may rush to YouTube or page 1 of Google to consider an answer (Renwick 2016; Papandrea 2012). In this case, pedagogy as the driver would determine the type of resources students should use and how to locate them, enhancing both research skills and literacy. Literacy is no longer exclusive to paper and pen and it would be unfair to compromise this for the sake of technology, hence it can be argued that educators should continue with pedagogy frameworks yet lead with technology to create powerful lessons (Renwick 2016).

2.1.3 Inclusive TEL

Personalisation is about ‘putting citizens at the heart of public services, enabling them to have a say in the design and improvement of the organisations to serve them’ (DfES 2004). In education, personalisation should accommodate a learner’s educational needs, interests, and aptitudes. It can be argued that learners with limited cognitive ability, megacognitive skills, and social skills have benefitted from using personalised, educational digital technologies. Gleason (2019) argues that as digital technologies emerge and develop, it is common to see affordances being applied to learners in this group. Campigotto, McEwan and Epp (2013) reported that two schools in the Toronto area had begun using mobile devices for grade 7 learners with limited cognitive ability in tasks which included linking words to pictures. On average, language skills increased by 5.76%, mathematical skills by 5.56%, environmental awareness skills by 7.59% and social skills by 4.23%. It can be argued that combining elements of gaming with education on mobile devices develops megacognitive skills such as independent learning (Brown et al. 2011). Children with access to computers at school have been associated with a reduced likelihood of playing truant at age 16 (Baskerville 2021; Kowalski 2019). Therefore it is sensible for behavioural units at schools to have digital
technology present. Passey et al. (2004) found that teachers who used digital technologies with learners who have behavioural issues showed an increased learner and social engagement. A further study by Passey (2011) reports that behaviour is influenced positively when learners are introduced to a VLE and become aware of how technology can be associated with ‘positive social outcomes’. In other words, the benefits of technology can go beyond supporting academic performance and link to enhancing the overall well-being of an individual. This does not appear to be acknowledged by policy-makers due to the disconnect between those who govern and those who are the experts. For example, in an attempt to combat London’s knife crime epidemic, the Home Office, with support from Sajid Javid in 2019 ordered a complete ban on social media for those suspected of knife crime. This is despite some research proposing that social media can act as a form of therapy for some young people, as it can alleviate stress and anxiety, and it can encourage accountability in conflict resolutions (Passey 2013; Lindly 2022).

Learners not physically present in classrooms face particular challenges accessing the curriculum. ‘Non presence may result from home schooling, absenteeism (hospitalised, in motherhood, in care, or homelessness), exclusions, or even perhaps being in prison’ (Passey 2013). Digital technologies can enhance educational provision in these instances as revealed by the research that was completed by Alyeska Central School in Alaska. In this example, teachers worked with ‘non-present’ students around the state via email, the Internet, telephone, and other digital technologies that are routinely used (Lines 2001). When reviewing the results of attainment in home schooled learners within this area, it was concluded that ‘home schoolers do well and in most cases usually score above average in any subject area and at all grade levels’ (Lines 2001). This is perhaps evidence of social media’s ability to reduce health inequalities in children from deprived areas (Lindly 2022).
Learners with physical disabilities may have limited ranges of sensory and physical engagements in classrooms, however, it can be argued that specifically designed access technologies widen educational opportunities for these learners (as in Gleason 2019). There are two types of technology to support young people with physical disabilities, assistive technology, and access technology. Assistive technologies are designed to help support an individual with a task, for example a screen reader, a switch adapted mouse or voice recognition software (Passey 2013). Likewise, accessible technologies are designed with a collection of users in mind, and they can help in making websites autism friendly. Corinne Weible (2018, p. 2) from the Partnership on Employment & Accessible Technology (PEAT) highlights the importance of access technologies by noting that: ‘Assistive technology alone will never guarantee access for people with disabilities because tools like websites, and software such as those used for eRecruiting, they really must be designed with accessibility in mind for people to actually be able to use them’.

It can be argued that individuals with shyness, emotional distraction or anxiety, experience challenges when engaging with education. Some studies have indicated positive emotional features and attributes are supported through the use of digital technologies, for example a study by Chen and Sun (2012) explored the use of various digital media with categorised learners. Chen and Sun (2012) identified learners as either visualisers (preferring visual information that emphasises the visual) or verbalisers (who prefer written information that stresses the verbal). However, several researchers argue that the whole notion of having a link between visual, auditory, and physical preference for a certain learning style, and the dependence of performance on that learning style is non-conclusive and raises several doubts (Coffield, Moseley, Hall and Ecclestone 2004). A number of learning styles are insufficient to truly identify traits in learners, alongside being confusing in their definition, and weak in reliability and validity (Coffield et al. 2004).
Nonetheless, it is argued by Chen and Sun (2012) that video-based materials support learning outcomes and positive emotions for verbalisers, while visualisers work better with animations. Online discussion forums have been shown to be used more by and to benefit learners who exhibit traits of anxiety and shyness (Passey 2013). Lowering anxiety levels may be a key need to increase engagement, which can be supported by digital technologies (see Dewan 2019). In the context of dental anxiety, Salam, Yahaya and Ali (2010) developed an application named the Persuasive Multimedia Environment (PMLE) which provides a self-mechanism for children to overcome their anxiety with assistance from their parents or teachers. Tests taken before and after the study showed a statistical difference, indicating PMLE was effective. In other words, the participants had reduced anxiety feelings when visiting their dental practitioner, therefore this indicates that TEL has much pedagogical potential.

Harcourt (2012) argues that engagement with learning does not currently take account of learners’ perspectives enough. Although engagement involves interaction with peers and adults, it has solely been observed and measured from the adults’ perspective. Whether a young person is engaged appears to be reliant upon adult observations and interferences in relation to a child’s behaviour and internal state (Harcourt 2012 and it is argued that disengagement in learning arises due to personal characteristics and attributes. Joffe and Black (2012) reveal that from a study of 352 mainstream secondary school learners, difficulties in engagement occur at a time when the individuals concerned experience social, emotional, and behavioural difficulties. In terms of digital technologies, handheld devices are usually a suitable way to support engagement with learning (Brown et al. 2011; Gao et al. 2017; Landson et al. 2015; Selwyn 2016). Ibrahim and Kadiri (2018) argue that learners with negative attitudes towards learning can be supported by handheld devices such as mobile devices and tablets because handheld devices appear to reduce the amount of prompting and assistance needed from a
teacher during task engagement, as well as encouraging time management among students with disabilities. Tasks that require learners to conduct problem-solving and complex activities without continuous prompts are referred to as multidimensional and may only be possible with technology (Yelland and Kilderry 2010).

In a broader sense, digital technologies, such as eBooks, have superior outcomes to printed books, including comprehension, oral responses and reading logs, accessibility and ease of use (Farid et al. 2021).

Living in remote areas of the world such as rural China presents challenges that can lead to lower levels of attainment. Li and Ranieri (2013) studied four schools in China, involving 658 learners and found learners in rural or migrant schools scored low in metrics such as social support and digital autonomy. As a potential solution, schools began using podcasts and social networking to support learning processes (see Yu, Tian, Vogel and Kwok 2010; O’Bannon, Lubke, Beard and Britt 2011). However, the achievement was not affected by the preference to learn through these learning tools and Rienties et al. (2012) argue that the general characteristics of this group need to be considered. Autonomous learners, for example, will flourish under these conditions however those who rely on scaffolding may not obtain the desired support. However, Rienties et al. (2012) also argue that a computer-supported collaborative learning environment is possible and this suggests a balance between the two types of learning or personalised resources is necessary in order to address the needs of the group separately.

2.1.4 Social networking services (SNS) in education

Social media was traditionally designed to pursue social activities and to create an ‘online community for us all’ (Zuckerberg 2017). This included creating social profiles and engaging in digital dialogue, it was not one of education or learning support (Junco et al. 2012; Beetham 2015; Purvis, Rodger and Beckingham 2016). Educators are now discovering that social media
goes beyond personal need and links into educational contexts where it can contribute to a digitally competent graduate (Seaman and Tinti-Kane 2013). It can be argued that educational institutions do not typically enable successful pedagogical opportunities for ‘digital natives’. Helsper and Enyon (2010) contributes further to Prensky’s (2001) ‘digital natives’ and ‘digital immigrants’ debate by claiming the distinctions are generational, meaning there is little evidence that young people are radically different in the ways they use and process information (Bennet et al. 2008). There is a growing body of academic research that has questioned the validity of generational interpretations of the ‘digital native’ concept (Livingstone and Helsper 2007). Previously, Prensky had drawn his claims on the theory of neuroplasticity, which suggests our brains are flexible and subject to change throughout life in response to changes in the environment. Thus, young people’s brains have developed differently to the generation before them. However, it is not yet known what differences (if any) there are in the brain structure of adults and young people who use digital technologies (Helsper and Enyon 2010).

The creation of an increasingly demanding marketplace has meant social media now plays a critical role in business support, liaison, research, presentation, problem solving and reputation (Qualman 2009; Burgess and Burgess 2014; Dabbagh and Kitsantas 2012; Kacker and Perrigot 2016; West 2017). Sheffield Hallam University (SHU) careers service (2014) reports an increased use of social media for recruitment, in addition to an increase in social media skills in person specifications. The workplace now demands employees are social media ready (Freberg and Kim 2018).

The use of social media in HE has delivered positive outcomes, including evidence of increased student engagement and increased grades (Junco et al. 2011, Ratneswary and Rasiah 2014; Landson et al. 2015; McKay et al. 2014; Tess 2013). Although HE institutes are increasingly responsive to the SNS compared with the education sector in general, they have delivered some ‘pushback’ over concerns around e-professionalism and digital safety (Lupton
A study by Purvis, Rodgers and Beckingham (2016) at SHU, explored the experiences of social media in HE after introducing optional workshops requested by staff to give them confidence using social media in their teaching and learning. The authors found that most staff, with the exception of some in journalism saw social media as an optional element to add to their curriculum areas even though they were increasingly confident with using wikis and the VLE for pedagogy. Furthermore, those who used social media to enhance course community, facilitate autonomous and creative learning, and develop public facing professional portfolios, were the most confident members of staff in SNS. A lack of confidence was perceived as the main barrier for not using particular learning tools with some educators confessing to being a ‘technophobe’. Where confidence was high and support available, the uptake of social media as a technology enhanced learning tool was increasingly prevalent and successful. However, there was confusion about the perceived benefits to using social media, with most understanding the benefits of YouTube however not Facebook. In addition, there was a correlation between the personal and professional use of certain SNS and the implementation in their teaching. Further data collection found some students who used social media as a resource found that this held the potential to enhance their employability, while others need further support and guidance to develop their online learning skills (in Purvis, Rodgers and Beckingham 2016; Parkes, Stein and Reading 2015). The authors conclude by recommending a review of the set of skills and development needs of staff with most universities moving towards this way of working.

Twitter is a microblogging SNS that allows users to follow people or organisations and post their own ‘tweets’ to engage with their own followers. Tang and Hew (2017) define Twitter as ‘one of microblog services that allow users to send and receive information real-time’. The real time functionality means Twitter is dynamic and that the multimodal content is continuously changing over time. This may appear obvious, however content on other
interactive educational portals such as university Blackboard, Moodle and Abyasa often remain static. Likewise, Twitter is free, meaning educational resources can be shared from all over the world at no cost, hence why teachers have exploited Twitter in various studies, durations, and disciplines (Haythornthwaite 2016; Junco et al. 2011; Landson et al. 2015). The benefits of using Twitter expand beyond connecting with fellow professionals, as in education where it has been documented to promote learning and improve engagement (Lewis 2017; Marich 2016; McKay et al. 2014; Juno et al. 2011; Junco, Elvansky and Heiberger 2013). However, right now, educators mainly use Twitter for communication purposes outside the classroom (Tang and Hew 2017; Alias et al. 2013; Buettner, 2013; Shabgahi et al. 2013). Haythornthwaite (2016) presented a case study which shows Twitter among the top two learning tools in the classroom, with 69% of those surveyed being enthusiastic about Twitter and its potential for pedagogy. Thus, it is imperative that researchers and educators alike, know the successful and meaningful incorporations of Twitter and what can be further improved. (Tang and Hew 2017).

Previous applications of Twitter are shown in Table 1, with the categories being informed by Tang and Hew’s (2017) work.

<table>
<thead>
<tr>
<th>Category</th>
<th>Example of activities</th>
</tr>
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<tbody>
<tr>
<td>Communicating</td>
<td>Teacher posting course materials (Bahner et al. 2012; Blessing et al. 2012)</td>
</tr>
<tr>
<td></td>
<td>Students using a common hashtag to tweet and communicate (Bista 2015; McKenzie 2014)</td>
</tr>
<tr>
<td></td>
<td>Students tweeting in French to practice the language (McKenzie 2014)</td>
</tr>
<tr>
<td>Assessing</td>
<td>Students creating tweets using specific contents learnt during class time (Cacchione 2015)</td>
</tr>
<tr>
<td></td>
<td>Teacher posting surprise questions in class on Twitter (Kim et al. 2015)</td>
</tr>
<tr>
<td></td>
<td>Students debate and discuss on Twitter (Tur and Marin 2015 cited in Tang and Hew 2017)</td>
</tr>
</tbody>
</table>
Students answer questions via direct message after class (Chen and Chen 2012)

Students tweet their answers in response to questions which were worth 5% of the overall course grade (Rohr and Costello 2015)

<table>
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<tr>
<th>Collaborating</th>
<th>Students creating a joint diary/log on their timeline (Kassens-Nor 2012)</th>
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<tbody>
<tr>
<td></td>
<td>Students coordinating a time in a volunteer project (Junco et al. 2011; Junco et al. 2013)</td>
</tr>
<tr>
<td></td>
<td>Using Twitter to negotiate time and groups (Junco et al. 2011)</td>
</tr>
</tbody>
</table>

Table 1. Examples of how Twitter can be used in the classroom.

Utilising Twitter initially grew within the social sciences, however with an increasing familiarity of the platform, Science Technology, Engineering and Mathematics (STEM) professionals have begun exploring Twitter as a supplement to teaching (Gleason and Manca 2019). Instances of this form of pedagogy tend to lay within ‘Communicating’ and include classroom instruction such as tweeting relevant research papers (Otchie and Pedaste 2020). A major difficulty in implementing Twitter in the classroom is making sure that the educators are prepared with basic operational skills, such as the mechanism to follow/unfollow users, and understanding the use of hashtags. Studies have shown neither instructors nor learners are automatically adept at using Twitter (Junco et al. 2011; Tang and Hew 2017; McKay et al. 2014). When participants become familiar with Twitter, they rate it positively, yet there appear to be concerns around distractions on the platform when using Twitter in classrooms (Junco et al. 2013). Thus, Twitter can be potentially useful for pedagogy, however as with other forms of TEL, there are also challenges in applying this form of social media successfully in teaching and learning.

2.2 Academic critiques
Education is perhaps one of the most important ways that the state can intervene in the life of families and an individual (Ward and Eden 2009). For example, in 2007, the Labour government attempted to create an enhanced and cohesive community by strengthening faith schools (Berkeley and Vij 2008). An Organisation for Economic Co-operation and Development (OECD) report shows that across the world, governments are spending more on education, year on year. In the U.K. the education budget rose from £30billion in 1997 to £88billion in 2017 (UK Public Spending- National Education Analysis Report 2018). State spending has increased to fund teacher salaries, further support staff, better resources, and new school buildings (Ward and Eden 2009). However, the relationship between educators and policymakers is not defined by funding, and does reach other contentious issues such as inequality in society, regulation of teaching practice, and the National Curriculum (NC). Interestingly, there appears to be disagreement on how the NC is delivered, with expert practitioners criticising the government’s approach, ‘having the most tested school population in the developed world detracts from children’s learning’ (OECD 2008). This argument is supported by researchers and academics who have previously claimed that testing impedes opportunities for productive and meaningful teaching (Lahey 2014). Despite this, the last twenty years have seen both Conservative and Labour governments push for further testing in children as young as five, in order to achieve baseline scores for each pupil. In 2018, the education minister, Nick Gibb provided a rationale: ‘This quick, simple assessment will us help to capture the progress that children make throughout primary school and provide a fairer measure for school accountability’. Specialists in education, i.e., teachers, felt that a baseline test that is conducted on a tablet and before a teacher has had a chance to develop a relationship with the child does not inform them about the children they work with and fails to be useful for parents (National Education Union 2018). The trading of opinions back and forth illuminates the tension that can exist between policymakers and educators.
Smith (2016) argues that there are 12 key questions in education that often receive passionate debate in parliament, staffrooms, and the ‘blogosphere’. It is these questions and their longevity which get to the heart of the disagreements over the nature and purpose of education. Smith’s (2016) key questions are shown in Table 2.

**Key Questions in Education**

<table>
<thead>
<tr>
<th>Does Childhood have a future- or a past?</th>
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<tbody>
<tr>
<td>What does society expect from schooling?</td>
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<td>How far should the state interfere in education?</td>
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<tr>
<td>How much influence should religion have in schools?</td>
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<tr>
<td>Why do children misbehave?</td>
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<tr>
<td>How are children taught?</td>
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<tr>
<td>Why have girls (and boys) underachieved in education?</td>
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<tr>
<td>Why has citizenship education within the national curriculum been so contentious?</td>
</tr>
<tr>
<td>Should sex and relationships education be part of the school curriculum?</td>
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<tr>
<td>Should schools be feeding their pupils?</td>
</tr>
<tr>
<td>Has elementary teaching ever been a profession?</td>
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<tr>
<td>What might schools be like in the future?</td>
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*Table 2. Smith’s (2016) key questions in education.*

Policymakers consider how education could look in the future, and this has an impact on TEL integration (Prensky 2008). Prensky (2001) argues that children are incrementally different to those from the past and live in a world where access to information is now entertainment:
Unfortunately for our Digital Immigrant teachers, the people sitting in their classes grew up on the ‘twitch speed’ of video games and MTV. They are used to the instantaneity of hypertext, downloaded music, phones in their pockets, a library on their laptops, beamed messages, and instant messaging. They’ve been networked most or all of their lives. They have little patience for lectures, step-by-step logic, and ‘tell-test’ instruction.

Governments have committed to continue to invest in TEL (Conservative Party Manifesto 2017), in addition to several schools trading textbooks for screen data and interactive websites (Smith 2016), although, there is a continuing debate about skilling up digital immigrant teachers to become TEL ready. It is argued that without adequate training, the digital technologies which sit in classrooms will fail to cultivate higher order thinking skills (Conte 1997; Oliver 2016).

2.2.1 Education and the state

The importance of the role the state has in public education has been discussed by numerous scholars, including Bowles and Gintis (1976), Carnoy (1974, 1984, 1989), Apple (1979), Giroux and McLaren (1989), Levin (1978, 2001), Bray (1999), Daun (2002), Ward and Eden (2009) and others. There are instances where schools are not reliant on the state, as in private schools or home schooling, however this individually makes up a small percentage of children in education. Zajda (2004) describes the role of the state in mainstream education and the curriculum as a paradoxical one. On one hand, in order for ‘common values’ and to ‘unify the process that young people undergo’ to support a highly diversified society, there is a necessity for centralisation of certain functions that is, the concept of a ‘nation state’. However, education policies that aim to achieve standardised curricula, national standards and standardised assessment can receive ‘pushback’ from educators (Daun 2002). The state now has control over the curriculum and over the qualification of teachers. Regardless, it may be in
a school’s best interest to allow the state to become interventionist with regards to guidance and policy in technology as it can be confident that data is safe and secure (Burton et al. 2021). There may also be benefits from a purchasing technology via a state-regulated procurement system.

In the U.K., it is not the teachers who necessarily determine what is acceptable pedagogy, as there are political ideologies that argue for decentralisation, or the ‘distribution of educational power’ (Zajda 2004). In terms of benefits, decentralisation can lead to an improvement in the quality of, access to and efficiency in the delivery of schooling (Hanson 1995; Carnoy 1999; Zajda 2003). Ironically, these are the same arguments used in defence of centralisation (Zajda 2003 and 2004), and this can result in a disconnect between policy makers and educationalists. Despite which neoliberal politicians are in power, the role of the state remains similar and can be defined as:

A desire to achieve greater efficiency in cost-saving, global competitiveness, technological supremacy, social change, and accountability, linking to goals of economic growth, nation-development, and nation-building (Zajda 2004).

In a social context, Bourdieu (1977) and Bernstein (1961 and 1971) argue that the role of the state, through control of education, facilitates social reproduction of the knowledge-power relationship, indicating decentralisation may be healthier. There is a plethora of new research that highlights the complexity of educational outcomes in late modern societies (Duan 2002), and this results from equity and conflictual issues, including issues in association with diversity and uniformity in decentralised education systems (Zajda 2003). Much of this new and increasingly widely accepted research adopts concepts from Lev Vygotsky’s social constructivism theory and Paul Trowler’s (2008) socio-cultural theory.

When elected, the government assumes the right of responsibility in schooling, with the Education Secretary accountable to the electorate. Ministers are charged with handling the
supply of school buildings, the employment of teachers, funding of pupils, the National Curriculum (NC), assessment regimes, and any laws that compel a) student attendance and b) quality assurance through school inspection (Smith 2016). In 2011, the Education Secretary and Conservative Member of Parliament (MP), Michael Gove initiated new academy schools and free schools funded directly by the government rather than local authorities. Schools became freer to innovate and specialize their own curriculum, however they still were obliged to follow core subjects from the NC such as Mathematics, English and Science. By 2015, four free schools were shut down having been declared inadequate by Ofsted, and it became apparent that the guidance of the state was still required in regulating the English education system. In contrast, the traditional Labour Party believes in ‘big government’ and sees the state as responsible for creating social justice and for equal distribution of resources (Ward and Eden 2009). In short, the Labour Party are in favour of regular government interventions in education, whereas the Conservative Party are traditionally not in favour of such interventions (Tooley 2000).

It is a well-accepted principle in general in the U.K that education is a legitimate area for state intervention (Smith 2016), especially when it comes to funding, maintenance, and culture. In the Victorian era, there was a laissez-faire approach to schooling with no state funding, minimal regulation and provision left to private enterprises (Johnson 1979). It soon became clear that working class families were not equipped to send their children to schools and that a ‘safety net’ was required for the poorest parents (Tooley 2000). The twentieth century brought about further intervention in education, however it was typically important not to make plans too rigid as schools were considered to need ‘freedom to experiment, room to grow, variety for the sake of freshness, for the fun of it even’. (Wilkinson 1946 as cited in Smith 2016). A recent intervention came in 2002 when the Department for Education (DfE) introduced Citizenship as a compulsory subject for all secondary children as there was a perceived need for pupils to
understand that they play a full part in society as active and responsible citizens (Teaching Citizenship 2019). With such a huge outlay (£88billion) involved in funding schools, it is understandable that the state expects some accountability. Although, it can be argued that constant minister changes driven by short term ‘firefighting’ by those who ‘have never taught a class of children in their life’ is not in the best interests of the children or teachers (Bell 2015).

2.2.2 TEL and strategy

The presence of technology constitutes a demand on teachers to sharpen their educational vision (Lund 2004; Biesta 2016). Although, this can often be deflected (perhaps rightly) to those who set education policy; design guidelines to deal with social and educational challenges lay with the policymakers (Slakmon 2017). The government must consider how children socialise and use digital technologies before any significant curriculum evolution takes place. The Committee of Inquiry into the Changing Learner Experience (CLEx) concluded that technology had led students to become impatient in learning environments, and that higher education students preferred quick answers as to a ‘casual approach to evaluating information’ (CLEx 2007). Further implications from the CLEx (2007) report showed that when visiting websites, children pick up information in random ways and follow interesting knowledge horizontally rather than vertically, thus potentially improving selectivity. Rather than embracing the findings in these reports, both Labour and Conservative governments have consistently said ‘technology is not a substitute for knowledge’ (Morgan 2016). This often means that schools are using computers and tablets as an administrative aid to capture class attendance, attainment, and pupil progress.

Although political parties in the U.K. have shown an interest in applying technology to pedagogy, they have a tendency to oversimplify the word ‘technology’ in their manifestos. In 2015 the Conservative Party made 17 references to the word technology, and in 2017 they made 30 references (Conservative Manifesto 2015; 2017). It can be argued that this is ‘short
sighted’, reflecting the lack of understanding policy makers have for developing education technology. Technology is regarded as being of ‘benefit’ for ‘teachers in the preparation of lessons and marking’ (Conservative Manifesto 2017 as cited in Ingleby, Wilford and Hedges 2018). The manifesto does not identify the steps involved in applying technology to pedagogical processes, but rather provides examples of how technology can be used for administrative purposes. There is a lack of understanding of the teachers’ perspective and Ingleby (2016, p. 43) recommends that ‘technology ought to be used in ways that enhance the wider pedagogy that is taking place if teaching and learning with technology is to be successful’. The consequence of unclear processes that are involved in achieving technology enhanced classrooms is that digital technologies, such as tablets and laptops will either sit idle, or a lack of deep learning will occur (Yelland 2006).

Similarly, educators can oversimplify their digital technology requirements for pedagogical uses in their classrooms. Wulfert (2012) argues that teachers are positive about having iPad and mobile devices in their classrooms, yet fail to make sense about what could be the teaching/learning impact of deploying tablets to students. For example, there are instances where teachers and students are given tablets, however direct feedback, voting, viewing documents, quizzes and data entry tasks were completed outside the tablet (see Wulfert 2012). In this case, the tablet falls within the ‘emperor’s new clothes’ scenario, and although tablets may be useful for learning, without an IT infrastructure that includes training and funding, they are not useful for teaching. Furthermore, practical considerations that would usually fall outside a teacher’s remit ought to be considered. Wulfert (2012) describes the occurrence of a U.K. educational institute purchasing a 7inch tablets for students, and 10inch tablets for academic staff across the business school. The project team had worked within a budget, nonetheless, did not consult with academic staff before making decisions around the pedagogical use the tablets were to bring. Interestingly, feedback from a survey showed that 7inch tablets were
attractive to academic staff as they could carry them easily between meetings and lectures. On the other hand, students preferred the 10inch device as it gave them better readability and general usability whilst still fitting easily in their bags. These results demonstrate that without coproduction that includes practitioners, devices sought for TEL can become peripheral to pedagogy and even redundant.

Furthermore, Bers (2008) proposes that decision-makers take a supplementary creative approach to applying technology to pedagogy successfully. McFarlane and Cartmel (2012) as cited in Ingleby, Wilford and Hedges (2019) argue that it is important to consider the needs of the participants who are engaging in professional development, if we are to enable ‘innovative’ professional practice. For example, Blackboard Learn is a VLE, with the main purpose of providing online elements to traditional face to face courses (Wolf and Peyre 2018). Blackboard has benefited from the rapid growth in online learning over the past decade and now serves over 17,000 schools and organisations (Skiba 2016). However, the learning management system has received critical feedback from academic staff using the system as part of their teaching. Kevin Nash (2016) from Newcastle University argues that Blackboard has become useful for filing resources such as PowerPoint presentations, however there are ‘no real pedagogical benefits for teachers’. The system allows for additional tasks and homework to be added, yet the quality of the tasks are limited and unidimensional. Blackboard is an ‘off the shelf’ product with a centralised approach, and this means educational institutes have little control over shaping the e learning system for their needs. Laurillard (2008) argues for the implementation of digital technology within education to be driven by educationalists in coproduction with technologists, rather than led by technologists. Currently, educators have to discover ways to use new technology (e.g., social media, tablets, apps for educational purposes) and an increasingly useful way of working would be for technology to meet a challenge, rather than a solution searching for a problem (France and Crompton 2012). Although Blackboard
Learn aligns with the TEL agenda, there is an absence of practitioner input in design. Numerous scholars recognise the need to shift the way educationalists and technologists work collaboratively (France and Crompton 2012; Crompton 2012; Laurillard 2008; Bers 2008; Wulfert 2012; Slakmon 2017; Bell 2015). Selwyn and Facer (2013) argue that ‘there remains limited analysis of the politics, economics, the cultures, and the ethics of digital technology in education’. Previously, ‘tech’ companies such as Google, Twitter and Facebook have designed products for the general population, and whilst technology initiatives have positive intentions about improving education and the educational model, it is worrying that a thorough analysis has not been made (Selwyn and Facer 2013). Lemke (2012) argues that there is a benefit for educationalists, for example, tablets have been used by the public for 10 years and the concept of having a portable computer to complete activities had already been instilled into people. This is vastly different to the period when the general population and schools introduced desktop computers simultaneously (Selwyn 2016). However, Bishawi (2015), France and Crompton (2012), Laurillard (2008) and Selwyn (2013, 2016) claim collaboration between educators, technologists and policy makers will result in improved educational provision.

Moreover, a third theme that is absent from political manifestos since 2010 is a discussion around CPD. A number of academics have highlighted that the CPD in the teaching process is fundamental to achieving success and progress (AlMutlaq, Dimitriadi and McCrindle 2017). Although the link between teaching and academic attainment can be problematic to determine (Goodall et al. 2005), if the educators are involved in high quality teaching through CPD, this can result in improvements in knowledge and pedagogical practices (Alexandrou et al. 2005). In the same way as there is a need for CPD in teaching, CPD within TEL is recognised as a critical factor in educational development (Kirkwood and Price 2011; Selwyn 2016). Ongoing development in digital technologies can mean that a number of complicated changes are being made to traditional methods of teaching, and this has been highlighted by a number of authors
(Ming and Azman 2010; AlMutlaq, Dimitriadi and McCrindle 2017; Kirkwood and Price 2011). In the work of Ming and Azman (2010), the academics noted that one of the key barriers facing integration is the reluctance to change, which is all too often attributable to TEL skill deficiencies and their inexperience. Ingleby, Wilford and Hedges (2018) explore this further, arguing for the importance of considering personal, social, and professional factor in developing effective CPD in TEL (as in Trowler 2008). Furthermore, the study argues that current training and workshops on TEL do not fully consider the complex personal and professional factors that influence TEL, supporting Leask and Younie’s (2013) recommendation of an ‘online environment’ of shared teaching resources for pedagogy and technology.

2.2.3 Policies pertaining to TEL

The Technology Code of Practice (TCoP) is a cross-government agreed standard used to support decision making on how the government and its agencies should design, build, and buy technology. The code of practice was first introduced in July 2021 as a response to help spending controls of technology during Covid-19. The previous guidance fell under various umbrella terms such as 'technology guidance' or 'codes of conduct' (Central Digital and Data Office 2021). Despite the evolution of this naming convention, the fundamental criteria aim to ensure that technology is accessible and inclusive, aligns with government strategy, can be collaborative, safe and secure, and data remains private. Since July 2021, there have been two further updates to the TCoP and numerous others since 2016. A dynamic approach towards policy seems reasonable as technology moves so quickly. Historically, the education sector has had to become increasingly reactive rather than proactive in policymaking (Braun et al. 2011).

Notably, the TCoP is the standard used for the Local Digital Declaration, which has direct implications for U.K. schools. For instance, the declaration aims at 'co-creating conditions for
the next generation of public services where technology is the enabler rather than a barrier to service improvements.' (Local Digital Declaration 2022).

Prior to the TCoP and Local Digital Declaration, there were a wide range of artefacts that, whilst viewed as advantageous for learners, exposed children, families and educators to safety and security risks. Furthermore, Burton et al. (2021) argue that although educational resources are deemed valid and widely accepted by their users, there are concerns about the appropriateness of conventional issues such as data protection. The responsibility of compliance may lie with the manufacturer or commercial actors, as it would be unfair for schools to conduct a lengthy procurement process for every iPad or IWB that is purchased. In other words, there is an assumption that technological products meet the latest compliance laws (Zimmerle 2019). Nevertheless, as schools move towards an increasingly digital way of learning, they should be aware of the latest policy and guidance in a fast-moving industry. As part of their teaching and learning offerings, schools may promote a learning platform for vulnerable children or those learning remotely; however, this particular piece of technology may have critical security flaws in the design that puts children at risk of hacking, phishing, cyberbullying, psychological abuse, surveillance, and in extreme cases, sexual abuse (see Crowell et al. 2020). Zimmerle (2019) argues that lengthy and often ambiguous policies contribute to misinformed users agreeing to terms that might compromise a child’s data.

The Times Educational Supplement (Tes) in 2020 warned schools of ‘Zoombombing’ after several incidents of lessons being disrupted by hackers using abusive language. In response, the children's commissioner for England, Anne Longfield, issued guidance for teachers, which included 'locking the virtual classroom' (Tes 2020, p. 1), that is similar to closing the school gates in the physical world.

Although the exposed risks of online solicitation, cyberbullying and mental abuse (Nikolovska, 2020) appear to be significantly adequate reasons not to use TEL in the
classroom, Chu et al. (2018) argue that despite the potentially serious implications, they can be easily corrected and mitigated by following the direction in the TCoP and related policies. In other words, school leaders must acknowledge that the digital world presents a range of risks that were not there before, meaning that they are now more vulnerable than they once were. Thus, it seems reasonable that schools become equally concerned with procedural matters such as the COPPA law and TCoP as with the resource implication of teaching and learning technologies.

Beyond policy that ensures compliance with the latest security measures, the U.K. Innovation Strategy (2021) aims to create and apply new knowledge to improve the U.K. through £22billion of funding. The strategy is not exclusively for technology, combining climate goals of achieving net-zero by 2050. The U.K. government references terms such as 'innovation', 'R&D', and 'technology missions'; however, there are few examples of what all this actually means. There are 'key technology families where the U.K. can develop strategic advantage, and which promise transformational benefits', however, despite this, there are challenges. The literature does evidence tension when educators use technology to completely substitute a task with technology rather than transforming it with the technologies; hence including this in the policy appears logical (Smith 2016; Puenteuda 2013).

Likewise, the government's 'Realising the potential of technology in education' policy also describes technology as an 'inseparable thread woven through the processes of teaching' (2019). This statement indicates that integrating TEL with pedagogy is more complex than what was first imagined (see Ingleby 2016).

Generally, the education sector and, in particular, HEIs have welcomed the government's strategy as it presents a further opportunity for university-business collaboration (O'Malley, 2021). The Covid-19 pandemic saw education and business collaborate successfully to ensure the continuation of the provision of learning. It is thought that further partnership between the
public and private sectors may find additional solutions to challenges facing the U.K., such as skills gaps and environmental challenges (Grissom 2021). Businesses that listen to education professionals and build products that complement how teachers apply pedagogy appears to be a successful pedagogical strategy. However, there are many examples in the education technology market where the pedagogical implications of the technology are viewed as being of secondary importance (Grissom 2021).

Moreover, Marshall (2021) argues that the strategy alone is not enough, and that it must be backed with transparent funded policies and incentives to enable it. There have traditionally been barriers that prevented teachers and education leaders from benefitting from technology, such as a lack of modern infrastructure and a greater need for digital capability and skills (Oliver 2016; Selwyn 2016). The ‘Realising the Potential of Technology in Education' policy attempts to address tension in this area by advocating for a greater emphasis on leadership and the awareness of developing pedagogical tools.

The EdTech Framework for Change sits within this policy and aims to be a valuable guide for addressing the barriers to using technology. The framework is broken into three significant steps, with the first step setting a vision for using 'EdTech'. There are four components to this first part: administration, assessment, teaching practice, and professional development. The framework highlights CPD as an individual component which is interesting as sometimes this is wrapped in with the administration of technology (Selwyn 2018). Likewise, this appears to be a positive development as scholars have long argued that there must be thought given to CPD in education technology policy (Darling-Hammond et al. 2009; Ingleby, Wilford and Hedges 2018; Kennedy 2005 and 2014)

Nonetheless, the framework does not detail in any way how CPD should be conducted in the TEL environment, and this remains one of the primary concerns. Details of who is best suited to deliver this training, as well as the session’s content remain important as there are
widespread concerns that the current professional development merely addresses the administrative uses of technology (Morgan 2016). In other words, CPD in this area is in need of being developed.

The second step discusses strategies to overcome barriers relating to infrastructure, skills, safety, and procurement. It is encouraging that infrastructure is acknowledged as many schools have little I.T. infrastructure in their area; and this can include problems with internet connectivity with modern broadband, and up to date, compliant, servers (Barrett et al. 2019). In contrast, the policy does not address fully the issue of the capability and skills of teachers as it makes reference to broad terms such as 'appropriate training' and 'confident staff' (The EdTech Framework for Change 2019, p. 8) whilst additionally arguing that schools want value for money when purchasing technology.

Within the policy, there is a case study that claims to evidence technology as being transformative, however, the example provided is that technology has allowed teachers to reduce out of class workload by an hour a day. This is particularly interesting as researchers have argued that technology becomes a barrier to teaching because it increases workloads, partly because it has not been implemented with thought given to pedagogical processes (Runhaar and Sanders 2015). This appears to be another focus on the administrative benefits of using technology as opposed to being a pedagogical focus. The policy would benefit from the inclusion of an example that demonstrates technology allowing teachers to conduct complex, multidimensional pedagogical tasks in lessons that would not have been possible without technology.

The final part of the policy draws attention to the school's responsibility to make technology a part of its pedagogy. Although there are recommendations for teachers to be innovative in their pedagogy, the focus is more on reducing non-teaching time, and making assessment 'efficient' (The EdTech Framework for Change 2019, p. 32). This appears to be a missed
opportunity, as a way of applying technology to improve teaching is to support inclusion, by making learning accessible and assistive (see Weible 2018).

Generally, I argue that this policy is more about evidence that there is progress in the area rather than supporting teachers with technology. For example, there are numerous references to the U.K. being a world leader in EdTech with a global reputation, however, there is an absence of detailed valid data to support this claim.

2.2.4 International context

Those who set educational policy agendas must understand the significance of the presence of technology in education, clarify its relationship to the heart of professional practice, and determine how to manage it (Slakmon 2016). Dialectical discussions appear to vary from leaders within different educational systems. According to Ulrich Beck, ‘Along the growing capacity of technical options grows the incalculability of their consequences’ (Beck 1992, 22 as cited in Slakmon 2016). In the U.K., for example, conversations around new technology fires imagination and elicits deep excitement, whereas education leaders in the middle east tend to feel apprehension and shift focus to the ‘dark side’ of technology (Foucault 1979; Robins and Webster 1999). In order to fully understand the subject, the connection between information technology, social control and power regimes ought to be considered (Slakmon 2016).

Technology presents a learning environment culture and a pattern of communication and thinking; all these precede the social order of the classroom (Kress 2003). The concept of ‘speech’ is no longer confined to a spoken conversation and is often used on virtual platforms. This paradigmatic change serves as a new way whereby the general population view world functions, thus, technology companies become potential mediators in learning (Collins and Halverson 2009; Wegerif 2013). Despite a collaborative goal of eliminating illiteracy, there are tensions between those states who operate a top-down sovereignty and the involvement of
vertical moving technology giants. For example, Google China, a subsidiary of Google was welcomed at its launch in 2000 and had reached 37% market share of a population of 1.3 billion, however in 2006 government officials began a campaign to censor the content on Google, in the belief that it would promote internal ventures rather than international ones. Google had refused to cooperate with China’s Great Fire Wall (GFW) mission and in 2009, their video sharing platform, YouTube, was banned from the country. This period saw the rise of social networking sites, such as Facebook and Twitter and to operate successfully in China, companies had to adhere to IP blocking, DNS spoofing, URL filtering, and VPN blocking, in addition to restricting any content that criticised the state. Those who were seen as not compliant with Chinese laws were banned (Google, Facebook, Wikipedia, Twitter), and those who could be nurtured and influenced by the state flourished (WeChat, Sina Weibo, Alibaba, Baidu, Soso). This state-controlled attitude elicits arguments about free speech and market capitalisation, nevertheless when the two agendas align, there is a potential benefit for education through coproduction, such as QQ (China’s equivalent to Skype). QQ is a service developed by Tencent alongside the Chinese government and is commonly used in most Chinese universities; online video platforms should provide a huge advantage for educators however there is a disconnect with educators in the U.K. Likewise, there have been struggles for both the EU and the USA in managing privacy laws with Google and Facebook. Nevertheless, the U.K does evidence successful TEL despite complex variables at play such as The Open University (OU).

Whilst there are challenges relating to privacy, ‘technology as a solution’ is an idea that is embraced within Israel’s educational technology policy. Slakmon (2016) argues that it is the labour market which plays a major part in designing the future curriculum, a direction that symbolises societal considerations in educational policy. New technology is often welcomed into classrooms (Carr 2010; Oppenheimer 2004). This is partly because most of the
development work is carried out by teacher-entrepreneurs, complementing pedagogical aspects of TEL by being firmly embedded in teacher training (Goldstein et al. 2012). When compared to teacher training in the U.K., there is an absence of innovation in the Teachers’ Standards (Clark and Zhang 2018). The introduction of the Teachers’ Standards in 2012 has frequently received criticism for being ‘too subjective’ and relying too much on ‘verbs that have to be modified to measure progress’ (Fordham 2017). In a TEL context, this lack of guidance linking pedagogy and TEL often means it is left out.

Like several sectors, the education sector is experiencing rapid internationalization (Bennell and Pearce 2003; van Raajj et al. 2008). In particular there are a growing number of students from developing economies studying degrees in the West, enrolling either as international students at Western Universities, or in institutions in their home country with partnerships with a Western University. The globalisation of education goes hand in hand with an increase in distance learning programmes, and this is supported by developing internet based electronic learning (e-learning) systems (van Raajj et al. 2008). E-learning systems combat barriers to learning such as time and space, although the success of these systems depend on the extent of student acceptance. The benefit of educational institutions, especially in the U.K. making this service available to their distance learning students, is that the very best from across the globe can reap the rewards of having a degree. For example, Chinese business managers are now pursuing Executive MBAs in the U.K. whilst being based in China, and Universities also benefit from the added strength to their research community (Sun and Zhang 2006; Martins and Kellermanns 2004).

2.2.4 Virtual learning environments (VLEs)

E-learning systems often called VLEs are designed for supporting and improving the individual study process (van Raajj et al. 2008). The VLEs have been part of the Universities’ architecture of the past 15 years and play a role in 95% of U.K. Universities (Alharbi and Drew
2014 as cited in Wilford 2018; Pituch and Lee 2006), and thus, have become an integral part of the teaching and learning process. VLEs also present an opportunity for universities to leverage their brand across geographical borders (Martins and Kellermanns 2004). A VLE is a web-based learning platform, that allows students, without the barriers of time and place, to access a wide range of different learning tool and course content (Raajj et al. 2008; Alharbi and Drew 2014). Although, depending on the manufacturer, there may be variety in the communication functionality, such as webchat, video chat, forums, and group discussions.

There are various naming conventions associated with VLEs, yet there remains an important distinction between VLE’s and Learning Management Systems (LMS). Despite some educators often using the terms interchangeably, LMS are used much more broadly outside of education, such as training in business services and manufacturing (Barnes 2014). The eLearning Guild (2014) published figures which suggested the term LMS is only used 21.7% of the time in higher education, with the remaining percentage consisting of training, financial, business services, government, and telecoms. In contrast, Moodle is a VLE and is primarily focused on acts of learning which have been facilitated. Both VLEs and LMS have many of same features, such as forums, quizzes, and reporting, however, the distinction rests in how they are being used and their development trajectory.

Much of the literature focuses on the administrative uses of VLEs, rather than pedagogical uses by the teacher (as in Raajj et al. 2008; Kurilovas et al. 2016). Despite this, there have been successful implementations of VLEs throughout the West, and student acceptance is often the cause (Martins and Kellermanns 2004). Researchers such as Selim (2003), Ong et al. (2004), Martins and Kellermanns (2004), and Raajj et al. (2008) have argued that student acceptance of a system is indeed a significant predictor into the success of that system. It can be argued that students prefer VLEs that contain readily available support, that are perceived as useful (downloading study materials), and adopt a social context (Sun and Zhang 2006). Further
research suggests that personality traits play an important role in the technology adoption process, in particular with consideration to computer anxiety (Karahanna et al. 2002). Functions to access learning materials are viewed as ‘useful’ and ‘essential’ by students (van Raajj et al. 2008), however some literature suggests that the provision of learning materials can lead to an increasingly passive teacher (Jisc 2009; West et al. 2007 as cited in Wilford 2018). Although a passive teacher approach may be viewed negatively, students are increasingly likely to believe the VLE will help them in their studies when they perceive it useful (Robinson et al. 2005). Furthermore, a popular feature associated with VLEs is the fulfilment of students’ communications needs, such as instant communication with peers and teachers in a variety of formats (van Raajj and Schepers 2008).

Some researchers argue that learners have different needs and characteristics, such as prior knowledge, cognitive traits and ‘learning styles’ and although this concept is debated, the awareness of differentiation of learning appears to be beneficial for students (Ingleby 2016). Thus, it is important that educational institutions personalise their learning processes according to the main characteristics of their students (Kurilovas et al. 2016). Built on constructivism, personalised learning has become popular in educational literature in recent years (see Beres et al. 2012; Dorca et al. 2012; Kim and Lee 2013; Zhang et al. 2012). According to the theorists, Becta (2008) and Kurilovas et al. (2016), VLEs have four main areas that can contribute to a personalised learning experience: communication tools (emails, messaging, and discussion boards), individual working space (learning resources accessible outside of lesson time), management tools (tracking individual progress), and security (access from any internet device). Several studies across Europe have gone further and allow the personalised creation of eLessons to match students’ learning styles, such as auditory, visual, and tactile/kinaesthetic (Komlenov et al. 2010; Popescu 2009). These personalised pedagogical agents are welcomed by educational practitioners.
Moodle and Blackboard are some of the most well-known VLEs, and they are characterized by their constructivist approaches, whereby their primary use is to collaborate, extend discussions and keep students informed. These characteristics are echoed in principles of constructivism and behaviourism (Piner 2014).

One of the main challenges in VLEs is assessment, as it differs from measuring attainment in the classroom. In VLEs, tools such as quizzes, and tests are used to measure educational outcomes, however formative evaluations that contain data about the quality of interactions and communication among peers, and levels of participation are harder to measure (Pesare 2015). Teachers would usually assess through traditional ‘face to face’ encounters, although this does rely on the quality of the evaluator, and a NQT may measure the quality of group work differently to an experienced practitioner. However, VLEs rarely present an overall picture for the evaluator and often use quantitative evaluations; Baker et al. (2005) argues quantitative evaluations are unreliable and not always significant. This conundrum offers scope for new opportunities and challenges that should be investigated within VLEs.

2.2.5 Future relationship

The questions around how the future of education will be required to be regularly reviewed to take into account social, economic, and political change (Wells and Claxton 2002). With vast advancements in technology caused by globalization and the rise of a ‘knowledge economy’, researchers recognise the need for ecological responsibility (Wells and Claxton 2002; Prensky 2008). New forms of educational technology (EdTech) are nothing short of revolutionary and have empowered educators to develop remarkable learning experiences (Pappas 2019). Technology has made knowledge almost universally accessible, disrupting the foundation of education (Lichtman 2014), and meaning the goal of education has changed from knowledge transfer to the circulation of wisdom. Students are similarly changing and are increasingly conditioned to take short pieces of information at a rapid pace, are comfortable
with multitasking, and seek workarounds that previous generations of learners have not sought (Lichtman 2014). Some teachers believe the need for instant answers have made students less likely to retain information; there simply is not a need to store information as much because it is so accessible. It is unclear whether interacting online, socially, and academically will have negative long term social impacts, however it is clear that students today feel further knowledge empowered than ever before (Lichtman 2014).

Educators have predicted that digital content will replace traditional textbooks by 2026 (Washington University 2019). Some of the benefits of eBooks include 1) they are delivered almost instantaneously, 2) no trees are required to make them, 3) they are cheaper to produce, and 4) more portable than books (Sasson 2019). It will be increasingly common for students to carry a library of hundreds of books around on a laptop or tablet. Educators are now experimenting with gamification (turning learning into a videogame) to elicit and engage learners, and this is likely to be deployed in Virtual Reality (VR), although this technology is not quite ready to be implemented in classrooms. (Lorenzo et al. 2022).

VLEs are continuing to grow, and it is likely educational institutions will begin to offer a wealth of online learning opportunities (Becta 2008; Kurilovas et al. 2016). As the students of tomorrow begin working with exciting resources, such as robotic kits, educators must be wary of how to track student performance. The ability to measure learning over time is not yet evident in VLEs or any TEL product. Pesare (2015) argues that because students are increasingly comfortable with interacting with screens than pens and papers, digitalizing their tests is at least customized to their learning processes. The ability to analyse data in a digital environment is richer than before, and there is scope for further development to measure quality of peer interactions and communications (Pesare 2015; Baker et al. 2005). The need for mindful and wellness practices in the classroom is often overlooked, nevertheless the future will see educational resources devoted to help balance creativity with thinking (e-Learning Industry
This will provide students with social, emotional, and mental support in a digital age that can often appear overwhelming, and educationalists appear to recognise that teaching mental health in schools and in the workforce can be of extreme value (Guide to Employee Mental Health 2018).

The idea of implementing technology in the classroom is not a contemporary one and has been present for a few decades. However, recent years has seen it take off rapidly and successfully, with computers, tablets, and IWBs (Henderson and Romeo 2015). Theorists and educators can make predictions about how the future relationship will look like between education and technology, however there ought to be attention given to how easily social, economic, and political changes can impact upon this relationship.

2.3 Professional development

Both professional development (PD) and continuous professional development (CPD) are interchangeable terms that claim to ‘meet the needs of teachers as learners in a changing society’ (Dadds 2014). There is a large body of international research on raising the quality of education, with particular emphasis on CPD to support professional and pedagogical growth (Darling-Hammond 2006). From an educator’s perspective, there is widespread agreement that effective CPD is an important component of educational success (Atencio, Jess and Dewar 2012; Darling-Hammond et al. 2009). Therefore, it is unsurprising that research interest in this area has grown, particularly in light of the digital agenda. More specifically, there are those who argue for CPD to be embedded in teachers’ daily practice (Desimone 2011), and those who argue that effective CPD fits in with ‘whatever works well’ with that particular individual (Webster-Wright 2009). In other words, there are no clear links between specific CPD and its impact on pupils learning, although some researchers have attempted to addresses the spectrum of CPD models (see Kennedy 2005 and 2014).
The notion of learning being a continuum is interesting, especially given the fact that education in the U.K. has a specific start and end. Furthermore, it could be assumed that because teachers are continuing their career without CPD, that they stop learning new fundamental practitioner skills. Yet, the OECD (2005) argues that lifelong learning is ‘a ubiquitous feature of life’ rather than ‘a special kind of activity that happens from time to time in special places’. Expanding on this perspective, teachers will continue to learn no matter what formal CPD they take part in (Claxton and Lucas 2009).

There are a number of different ways CPD can be structured and organised. Despite this, there is little robust evidence to support what constitutes as effective CPD (Hill, Beisiegel and Jacob 2013; de Paor and Murphy 2018). Although, recently there has been a shift away from the narrow understandings of ‘in service’ teacher training (Ofsted 2006), Tannehill, van der Mars, and Macphail (2013) argue that there are a wide range of relevant CPD activities that can be done outside the classroom, such as attending workshops, annual conferences, staff development programmes, reading professional journals and books, and pursuing advanced degrees (for example, a M.A. in Education).

Much of the research has been conducted across early years, primary, secondary, and further education, with a significant portion on the professional development in primary and secondary sectors (Baran and Correia 2014; Brooks and Gibson 2012; Kennedy 2005; Ingleby 2015). The current body of CPD literature shows support for social constructivists’ approaches to teaching and learning (Armour 2011; Chambers et al. 2012; Kennedy 2005; Darling-Hammond et al. 2009; O’Sullivan 2007). Lieberman and Miller (2008), for example, claim that ‘professional learning communities’ are capable of transforming teaching and learning for both the student and educator. Moreover, Trowler (2008) argues that exploring social interactions with ‘tools’ supports understanding how effective CPD can facilitate teaching and learning in the 21st century. In a TEL context, educators report one of the main barriers to effective use is
the lack of training in this area (Cheon et al. 2012; Conte 1997; Oliver 2016). Selwyn (2016) amongst others argues that digital training has a tendency to examine the actual technology, rather than how technology can benefit a teacher in the classroom (Mishra and Koehler 2006). Thus, it is important that CPD opportunities examine how educators can utilise technology to support technology.

2.3.1 Aileen Kennedy’s (2005) models of CPD

Educators have become pressured to accept new forms of pedagogy (Margolis et al. 2017), alongside making changes to their teaching practice (Lofthouse and Thomas 2017 as cited in Wilford 2018). There is an active debate in the literature around whether it should be the organisation (school), or individual (teacher) who takes responsibility of CPD (Weller 2009). When thought is applied to CPD, it can appear complex and this can result in educators not partaking in CPD. Teachers report that CPD can be organised in several different ways, yet, identifying the most appropriate model of CPD is challenging (Stevenson et al. 2016).

While most CPD experiences are considered in the form of enhancing knowledge, some researchers have argued that although knowledge acquisition is important, it is the context in which it is required and subsequently used that actually helps the nature of that knowledge (Eraut 1994). Eraut (1994, p. 20) suggests three contexts in which knowledge is acquired: 1) the academic context, 2) the institutional context, and 3) practice itself. Yet, these contexts do not give consideration to informal discussions and reading, thus, Kennedy (2005) proposes nine categories in which CPD can be grouped. These categories identify the potential sites of knowledge acquisition and considers how they might be adopted and explored (Kennedy 2005). The nine models of CPD are: training, award-bearing, deficit, cascade, standards-based, coaching/mentoring, community of practice, action research, and transformative; these models enable the author to critique participants’ CPD in a TEL context. Kennedy’s (2005) spectrum of CPD models and purpose of models are shown below in figure 1.
As teachers move from transmission through to transitional and to transformative CPD, there is increasing capacity for teacher autonomy (Kennedy 2005).

The training model is a popular model of CPD (Little 1994) that provides teachers with the opportunity to update their skills with training from an expert. The expert is the individual who delivers the training, whilst the teacher plays a passive role in the session. Most of this training takes place away from a teacher’s school, either at another school within a local trust or at an educational conference. For example, teachers across an academy trust would merge to take part in basic iPad training by an IT expert. Day (1999) argues that this model of CPD often lacks a connection to the classroom context, thus can be deemed as a failure of these training events. However, this model does support a high degree of quality assurance, where training needs are narrowed and whereby standardisation of training is met. At times, agreeing on a particular skill and agreeing a standard to be achieved often overshadows teachers’ own development needs. However, in the U.K., there is a notion that standardisation of training equates to improvements in teaching and learning (as in Ofsted). In this sense, the training
model provides an effective way for stakeholders to control the digital agenda by limiting the teachers to passive roles. Despite these criticisms, the training model is thought of as an effective means of introducing new knowledge (Hoban 2002; Kennedy 2014). A notable example of this is relates to training for designated safeguarding officers at a school.

The award-bearing model of CPD emphasises the completion of an award, usually validated by a university. Like the training model, this can be viewed as a mark of quality assurance (Kennedy 2005). An example of this is teacher training in the U.K. and attaining Qualified Teacher Status (QTS). While it can be argued that gaining this qualification through the various routes into teaching provides a necessary amount of standardised experiences for those working towards becoming a teacher, researchers have suggested the support on these courses are often perceived as academic, rather than practical (Solomon and Tresman 1999). Thus, there is pressure for award-bearing courses to focus on classroom practice. Additionally, there is extensive scrutiny over what the term ‘qualified teacher status’ actually means (Henderson 2002; Kennedy 2005). It is thought that as digital technologies enter the classroom, the term would evolve and that pedagogical uses of these technologies should be integrated into the professional courses. However, generally, professional qualifications, such as QTS and a Postgraduate Certificate in Education (PGCE) are perceived as equating to effective teaching and learning practices in their own right (Kennedy 2005).

The deficit model is PD that has been designed specifically to address an aspect of a teacher’s performance, such as their ability using technology. In the 21st century, this is a common deficit in practice due to the uncertainty over its purpose in the classroom (Kennedy 2014). In other words, expectations for competent practice in TEL is not typically clear. The deficit model relies on performance management to evaluate an individual’s performance and identify their weaknesses. Rhodes and Beneicke (2003) argue that performance management can raise the standards of teaching to a ‘greater efficiency, effectiveness and accountability’.
Although, primarily used to address an individual weakness, there are times when poor teaching can be attributed to organisational and management practices. It would be unfair to criticise a teacher’s differentiation on iPads when key software/apps have not been purchased/successfully implemented across the school.

The cascade model involves teachers attending training and then disseminating the information to their colleagues (Kennedy 2005). This is a popular method of training in situations where resources are limited. In a primary setting, for example, the ICT subject specialist would attend a subject specific training day then deliver a presentation on new tablet strategies to other members of staff. Day (1999) argues that this model does not give ‘consideration to the principles of participation, collaboration and ownership which had characterised their own learning’ (see Trowler 2008). Other educationalists have discussed the drawbacks to the cascade model, in particular the cascading process which is generally knowledge focused rather than values focused (Solomon and Tresman 1999; Nieto 2003; Day 1999); this is often referred to as a technicism view of teaching (Eraut 1994 as cited in Kennedy 2005).

Rather than viewing teaching as complex notion, the standards-based model represents a desire to ‘create a system of teaching that can validate connections between teacher effectiveness and student learning’ (Beyer 2002, p. 243). For example, a teacher must be able to provide evidence that they are capable of planning a lesson and teaching a lesson individually (TS 4). Meeting a ‘standard’ focuses on the competence of individual teachers at the expense of collaborative learning. In this case, it may be beneficial for departments to plan and share resources collectively. Smyth (1991) argues that inspection and accountability of such standards indicate a lack of respect for teachers’ own capacity to be reflective and critical. Beyer (2002) claims that teacher education must be infused with social purposes, future possibilities, economic realities, and moral directions, rather than a standards-based model.
Despite the literature often being critical of this model, standards based CPD does result in participation that allows teachers to engage with it (Kirk et al. 2003). Furthermore, standards based CPD does provide a common language, making it easier for teachers to engage in professional practice dialogue (Kennedy 2005).

Coaching and mentoring heavily involves elements of counselling and professional friendship (Rhodes and Beneicke 2002), hence the coaching/mentoring model emphasises the importance of the one-to-one relationship between two teachers (Kennedy 2005). This model suggests that coaching and mentoring is where one teacher is a ‘novice’ in a particular skill area, and the other is an ‘expert’. The premise of this model is that CPD can take place in the school context and is enhanced by social dialogue. A trainee teacher, for example, would have support from a mentor, who would coach and assess them against the Teachers’ Standards. A criticism of this model is that it is hierarchical, and those being mentored may not be able to discuss their beliefs and cultural in relation to teaching. Rhodes and Beneicke (2002) argue that peer coaching, where colleagues work collectively to reflect, refine, and build new skills is additionally supportive. Using the previous example, this form of professional development can occur when a group of trainee teachers reflect collectively, and coach each other. However, assessing an individual follows a hierarchical philosophy and this presents potential problems for Rhodes and Beneick (2002). In other words, for this model to be successful, individuals must be able to communicate well to convey messages about social and cultural norms of teaching.

Although, the coaching/mentoring model and the community of practice model share similarities in the form of being supportive, the main difference is that the latter involves more than two participants (Kennedy 2005). The other major difference is that it does not follow a hierarchical model. Wenger (1998) argues that all participants are members of one community that includes mutual engagement, developing repertoires, and understanding enterprise. Thus,
central to the community of practice model is that learning within a community is a result of interactions within the community and not planned training/courses (Kennedy 2005). Students connect with each other using platforms such as What'sapp and Facebook groups, for example, and this form of interaction can deliver unplanned provision and consolidate learning. Boreham (2000) suggests learning through communities can be an increasingly powerful site for the creation of new knowledge than existing models.

The action research model is based on participants acting as researchers with a view of improving a situation (Day 1999). Researchers argue that it has greater impact on practice when the context is relevant (Weiner 2002; Kennedy 2005; Burbank and Kauchack 2003). For example, a teacher is able to ask further critical questions of their own practice, in other words, their use of TEL in the classroom, if they are involved in collecting the data to propose new iPads for their school. Burbank and Kauchack (2003) suggest that the action research model encourages teachers to view research as a process, rather than a product of another researcher. Moreover, this model shifts the balance of power towards teachers by successfully completing research activities. However, Sachs (2003) argues that the extent to which teachers can effectively critique themselves is determined by the parameters around their practice. Despite this, the action research model has ‘significant capacity for professional autonomy’ (Kennedy 2005, p. 246).

Finally, the transformative model involves a number of practices and conditions that have already been mentioned, and that support a transformative agenda (Kennedy 2005; 2014). In other words, this model of CPD becomes a means of supporting educational change (Kennedy 2005; Hoban 2002) and is essentially an effective integration of the previous eight models. Hoban (2002) argues that the transformative model of CPD provides a sense of awareness of issues of power, and more specifically a raised awareness of the power and potential of CPD. However, there are tensions with the realisation of conflicting agendas and philosophies. It can
be argued that some of the terminology used in Kennedy (2005) is outdated, for example the communities of practice model is commonly referred to as ‘learning communities’, and this reflects an emphasis on ‘learning’ rather than practice’. However, the models have been designed to help analyse patterns and trends in CPD, rather than a particular model being the sole purpose of CPD (Kennedy 2014). Kennedy (2014) concludes that the analysis of CPD models are not the finished article, and more developing an enhanced understanding of CPD frameworks. Thus, terminologies around Kennedy’s (2005) models may in fact evolve further, such as the action based model and transformative model.

2.3.2 CPD in Education

A range of evidence exists which highlights how teachers’ learning can best be supported (Kennedy 2005 and 2014; Stoll et al. 2011; Ingleby 2015; Ingleby et al. 2018). A prominent example of this is through CPD provision which is experiential, collaborative, and derives from teachers’ work with students (Darling-Hammond and McLaughlin 1995; Stoll et al. 2006). Day (1999) captures the breadth and depth of CPD diversity:

Professional development consists of all natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group, or school and which contribute through these to the quality of education in the classroom. It is the process by which, alone and with others, teachers review, renew, and extend their commitment as change agents to the moral purposes of teaching; and by which they acquire and develop critically the knowledge, skills, and emotional intelligence essential to good professional thinking, planning and practice with children, young people, and colleagues through each phase of their teaching lives. (p.4).

This definition reflects the range of purposes CPD can serve. In the case of teachers, the OECD (2005) identified four key purposes of CPD, as shown below in Table 3:
**Key Purpose**

Activities intended to facilitate the implementation of policy or educational reforms, which are often taken by large groups of teachers together, for example, through conferences designed to provide new information.

Task-oriented professional development aimed towards preparation of staff for new functions, which are often taken by individual or small groups of teachers, and which may include courses, self-study and so on.

School-based professional development aimed at serving the aim of school development and which often involve groups of teachers from the same school working jointly on a problem or developing a programme.

Personal professional development chosen by the individual participant for professional enrichment and further education.

*Table 3. OECD (2005) key purposes of CPD for teachers.*

This can lead to a variation in teacher needs, for example, an experienced teacher would follow a different professional enrichment route to novice teachers. Both teachers would have distinct knowledge, skills and beliefs, and therefore distinct professional development needs (Bartell 2004).

The attention given to teachers’ own CPD needs may be undermined by obliging teachers to undertake CPD in certain priority areas. Furthermore, Kennedy et al. (2008) and Hardy and Melville (2013) argue that in the U.K. CPD provision is geared towards school improvement and performance rather than addressing the actual needs of teachers. This may be evidence why much of the literature discovers CPD to be ineffective or is perceived as ineffective by
teachers (Kennedy et al. 2008; Opfer and Pedder 2011). Furthermore, this highlights the importance of CPD programmes to be embedded in teachers’ own practice (see Borko 2004). Teacher development is most productive when teachers are involved in the planning, implementing and evaluation of the CPD programmes offered. For example, CPD should take place at a teachers’ school where they have ‘authentic context’ and can collaborate with their own colleagues, directly meeting the needs of their work context (Mansour et al. 2014).

Bubb and Earley (2013) argue that there is a universal problem in finding sufficient time for CPD, yet schools in particular certainly do not make the best use of what is available. Teachers do not have time to discuss in any depth ‘any substantive teaching issue and did not attend CPD activities’ (Avalos 2011, p. 16). Interestingly, there are now frequent discussions around how CPD should prioritise the individual, school and system needs (Avalos 2011; OECD 2005), leading to greater analysis of teacher involvement in planning for CPD (Geldenhuys and Oosthuizen 2015). Van den Bergh, Ros and Beijaard (2015), for example, argue that as part of responding to the individual needs of the teacher, it is necessary to consider that teachers learn differently. Additionally, differentiated feedback for the individual is important for their professional development needs (van den Bergh, Ros and Beijaard 2015). This can be linked to the motivating factors among teachers for undertaking CPD (as in McMillan, McConnell and O’Sullivan 2016). The authors present four motivators for teachers: 1) interest in the subject area, 2) career advancement, 3) personal choice to improves one’s teaching, 4) relating to responsibility. These motivating factors have been refined from Herzberg, Mausner and Snyderman’s (1959) earlier work.

Whilst there is plenty of literature on the ‘how’ of CPD, there has been less published on the ‘what’. More specifically, what content, area, skills and topics should be targeted? (de Paor and Murphy 2018). The narrow research in this area tends to focus on the needs of teachers at particular stages of their careers, such as in Kennedy and Clinton (2009) who identified CPD
needs in novice teachers. The study found that the most common needs included: subject specific CPD, career guidance, and ICT training. This is in agreement with El-Deghaidy et al. (2015) who suggest that teachers do not discover that CPD content meets their ICT pedagogical needs. Learning needs and priorities of teachers across different phases (primary, secondary, FE, HE) are different, and this is because some aspects of training are seen as increasingly desirable than others (Day 1999). Thus, it would make sense for providers of CPD to ensure future training has been differentiated as appropriate (Mansour et al. 2014).

2.3.3 CPD in TEL

There is a wide consensus that technology can improve the teaching and learning in schools and other educational institutes (Selwyn 2016; Gao et al. 2017; Fox 2013; Campbell 2015; Jones 2010; Landson et al. 2015; Junco et al. 2012; Papandrea 2012; Tarantino, McDonough, and Hua 2013; Evans 2014; Landson et al. 2015; Hanzel et al. 2018; Tess 2013; Freberg and Kim 2018), and in the U.K., this has led to commitment in supporting technology being used in the classroom (Conservative Party Manifesto 2017). However, there are questions that challenge if teachers are prepared to effectively use technology in their classroom (Polly et al. 2010). Even more so, there is no reference to the word ‘technology’ in the Teachers’ Standards (DfE 2017). Prensky’s (2001) theory around ‘digital natives’ has subsequently been developed into discussions around the importance of exposure to technology (Helsper and Enyon 2010; Bennett et al. 2008). However, teachers’ technological skills do not typically translate into the effective use at a pedagogical level in primary and secondary settings (Wang 2002). Yet, much of the CPD around technology tends to focus on improving technological skills, thus is disconnected from ‘methods courses’ and how technology can be effectively implemented into the classroom.

In order for a teacher to successfully implement technology, they must have an understanding of how the technology knowledge (TK) works and is related to technology with
content (CK) (in other words, how does this relate to students’ learning, and technology with pedagogies (PK) and how can I teach with this?). The difference between TK, CK and PK is discussed in the literature (Koehler, Mishra and Yahya 2007; Mishra and Koehler 2006). The technological pedagogical and content knowledge framework (TPACK) helps describe the different teachers’ knowledge and skills involved for a successful implementation of technology. This is shown below is figure 2.

![Figure 2. Framework for technological pedagogical and content knowledge (TPACK: Koehler and Mishra 2008).](image)

Furthermore, individual distinctions in participants ought to be considered when engaging in CPD, and this reinforces the complexity of TEL associated with PD (McFarlane and Cartmel 2012). The complex factors that include personal, social, and professional considerations are in direct contrast with policymakers’ ‘simplistic messages that TEL is representative of pedagogical best practice’ (Ingleby, Wilford and Hedges 2018). Firstly, considering personal factors addresses the various interpretations of TEL. For example, there are those who have used Blackboard as their new VLE, and those who view it merely as an online filing system.
Social factors allow for adjustments to be made for how individuals associate with TEL, and professional factors allow thought for how individuals want students to interact with TEL.

As teachers become increasingly knowledgeable about the benefits of TEL and comfortable with the use of technology in pedagogy, it is predicted that practices with integration of technology will improve (Keengwe 2009). Thus, CPD must attempt to provide opportunities that will impact teachers’ beliefs in technology. For example, Ertmer (2005) proposes that teachers must have first-hand experience with technology, where they can observe successful implementation from another teacher or educational professional. This would allow teachers to follow a ‘gold standard’ of practice which is more productive than admiring the technology out of context (Koehler and Mishra 2008). Keengwe (2009) highlights six objectives CPD providers ought to include in their training, as shown below in Table 4.

<table>
<thead>
<tr>
<th>CPD in TEL objectives</th>
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<tr>
<td>Learning how to use different technology and tools</td>
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<tr>
<td>Exploring different approaches to managing technology in the classroom</td>
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<tr>
<td>Recognising the critical role of technology in teaching and learning</td>
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<tr>
<td>Understanding how quickly and easily low-level assignments can be plagiarised</td>
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<tr>
<td>Recognising relevant laws and guidelines, such as GDPR and COPPA</td>
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<tr>
<td>Identifying specific barriers to technology integration and how to overcome them in the classroom.</td>
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Table 4. CPD in TEL objectives.

Teachers have reported that time out of lessons attending PD workshops that did not directly benefit their teaching was wasteful, therefore any training in TEL must help them
successfully integrate technology into their classroom instruction. Keengwe (2009) argues that there are a range of issues that schools are not addressing to successfully implement TEL, and proposes five strategies educational institutes can make for technology integration, as shown below in Table 5.

<table>
<thead>
<tr>
<th>Strategies for technology integration</th>
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<tr>
<td>School leaders must make technology a requirement through grading</td>
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<td>Technology professional development activities must align with teachers’ time needs</td>
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<tr>
<td>School leaders should install new technology tools that support new educational software</td>
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<tr>
<td>Technology integration specialists/ coordinators</td>
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<tr>
<td>Technical personnel to help teachers with their questions</td>
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Table 5. Strategies for technology integration.

Rodriquez and Knuth (2000) argue that for effective integration of technology, the following components must be met in CPD: connection to student learning, hands on technology use, variety of experiences, curriculum specific applications, new role for teachers, collegial learning, active participation, ongoing process, sufficient time, technical support, adequate support, and administrative set up.

In summary, for the effective implementation of TEL, teachers must have CK, PK and TK (Koehler and Mishra 2008), and the training required to develop teachers to this point must take into account their personal, social, and professional variables. In particular, the training must consist of ongoing processes, and technical support (Rodriquez and Knuth 2000).
2.3.4 Challenges

Across educational institutes, CPD plays an integral part in the pedagogical development of their practitioners, more specifically, meeting the professional needs of teachers in a changing society, with particular consideration to the digital agenda. Researchers, policy makers and expert practitioners have long argued that CPD should be capable, agile, and sustainable. There is a large consensus that CPD can offer teachers knowledge that links to their practice and supports professional and pedagogical growth. However, there are various challenges to CPD, not least the perceived effectiveness of the models described in Kennedy (2005).

A prominent theme across CPD in education is the disconnect between the training that is provided, and how meaningful it is when attempting to improve practice (Drago-Severson 2012). The body of literature that sits around CPD argues that for the most effective outcomes, CPD should provide support over a sustained period (Lawless and Pellergrino 2007 as cited in Wilford 2018). However, due to constraints that include funding, time, structure, and policy, this is not often the case (Margolis et al. 2017), and this has fuelled a debate around whether it is the school or teacher who should take responsibility of CPD (as in Weller 2009). Nevertheless, the complexity of CPD can appear overwhelming for educators, resulting in them not partaking in training (Margolis et al. 2017).

Herckis (2018) report that teachers may be ‘resistant to change’, and despite CPD providers’ best efforts, teachers have demonstrated that they are able to resist and reject the learning outcomes others plan for them, most prominently when technology is involved (Armour et al. 2015). The failure to embrace pedagogical strategies that relate to TEL could be explained by factors such as infrastructure; in other words, for a teacher to successfully incorporate TEL (social media, tablets etc), they would need support from their educational institute. Furthermore, a change in policy, team structure or funding priorities may be required
from the school to facilitate the adoption of TEL (Santagata and Bray 2016). Furthermore, CPD training is commonly viewed as a top-down process run by school management, and in this way, teachers may think that CPD benefits management goals rather than the individuals concerned. However, some teachers are now becoming increasingly aware that CPD can and should be tailored to their professional development needs.

Furthermore, training on digital technologies has a tendency to focus on the actual technology, rather than how the technology can be used in an educational context (Selwyn 2016; Mishra and Koehler 2006). An example of this is witnessed with teachers taking part in training on the essentials of Twitter, including key functionalities such as: what is a tweet, how to successfully use hashtags, and how to follow an individual. Without being digitally adept, teachers would fail to capitalise on the digital tools at their disposable (Mishra and Koehler 2006). Although, this type of training is important for developing an understanding of Twitter, it requires further pedagogical support and guidance to be successfully implemented in the classroom (Selwyn 2016; Trowler 2008).

Prensky (2001) argues that there are fundamental differences between ‘digital natives’ and ‘digital immigrants’. Those teachers who are part of the digital natives generation have been exposed to technologies throughout their lives and now instinctively know how to use them, thus impacting the type of training, if any, these teachers require. However, there is little evidence that young people are radically different in the ways they problem solve and process information (Helsper and Enyon 2010; Bennett et al. 2008). Further research has found that variation in age groups is less important than exposure to technology (Jones et al. 2010). In other words, students and teachers who have been using social media outside the classroom have a different set of digital skills than those who do not. Yet, being exposed to digital technology does not automatically increase an individual’s digital ability, especially without
rectifying prior digital deficits, such as the perceived usefulness of social media as a pedagogical tool.

In summary, CPD in education has typically been complex, nevertheless with the development of technologies it is increasingly important for training and development to have an awareness of what technology can offer teaching and learning (Owen 2017). In short, SNS offer educators a platform to collaborate with other professionals and be part of conversations around enhancing their pedagogical practice, although, this does require teachers to be digitally competent before they can embrace TEL in their CPD.

2.4 Theoretical perspective

Socio-cultural theory provides a core explanatory framework for the present research and in education research as a whole, although it has recently also become influential in the discipline of psychology (Mercer and Howe 2012). Socio-cultural theory argues that the relationship between social activity and thinking is vital and that this is a distinctive characteristic that underpins cognitive development (see Saljo 2009; Daniels 2001 and 2008). The theory is built on the foundations of Lev Vygotsky’s earlier work ‘cultural historical theory’ (van Oers et al. 2008). Vygotsky (1978) argues that human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them. Although Vygotsky’s main research interest was adult-child interaction, this claim draws attention to interactions between students and teachers, and students and their peers. This work is often seen as contrasting with the work of Jean Piaget however, educationalists still argue that there are considerable reasons to regard the theorists as being complementary rather than contradictory (Smith, Dockrell and Tomlinson 1996; Shayer 2003; Mercer and Howe 2012). Socioculturalism is characterised by the view that individual achievements and failures are not just dependent on ability and efforts, but that this is a product of culturally situated forms of social interaction. Hence, knowledge is not just possession, yet
a representative of a shared property of members of the community (Mercer and Howe 2012). These ideas have been brought into the framework of socio-cultural theory and the study of conceptual change. As an advancement, socio-cultural theory now considers the social context as multidimensional with significant values and practices (Trowler 2008) and attempts to generalise the ‘social’ is fraught with danger.

2.4.1 Social cultural approach to learning

Culture plays a significant role in how individuals’ minds are shaped, contributing to an individual’s thinking, talking, and acting. The accumulated set of cultural values are picked up when individuals are younger, and this helps them to work, play and solve problems (Wells and Claxton 2006). These beliefs and ‘ways of knowing’ are picked up by previous generations, or further experienced social contacts (Wells and Claxton 2006). When new problems arise, it is the individual who must make the most of their values, skills, and knowledge to explore a solution. It is not just the solitary actors to the communities that serve individuals, but likewise ‘social tools’, such as digital technologies that shape thinking and acting (Wertsch 1998). Social culturalists argue that both culture and the inherited resources of artefacts/tools develop the individual (Wells and Claxton 2006; Trowler 2008; Mercer and Howe 2012). Moreover, this approach to learning provides an alternative to cognitive theories, such as Piaget’s (1936) Theory of Cognitive Development, and has played an important part in contemporary educational research, especially in the area of TEL.

Social cultural theorists (Wells and Claxton 2006; Vygotsky 1978; Gergan 1991) argue that there are three discourses within which learning, and development can be framed. In other words, these perspectives to learning are crucial in understanding learning in the social, cultural, and historical contexts. The first discourse is ‘individual-development’, which views individuals as knowledge structures (see Vygotsky’s 1990 Cultural-historical activity theory [CHAT]). People are referred to as either good or bad at learning and knowing. As an example,
teachers may label a student ‘intelligent’ or having a ‘short term memory’ (Wells and Claxton 2006).

The second discourse is a ‘social-historical’ one, which views individuals in terms of changing social structures. In this discourse, individuals discover themselves within a social structure as opposed to a ‘reality’. A student, for example, may be described in the abstract in ‘subcultural’ ways as opposed to a defining psychological characteristic, for example as a ‘millennial’. The third discourse is the ‘irreducible situated moment’, which does not view the psychological attributes of an individual as predictors to their actions. In the moment, each unprecedented material is unique to the situation and has new demands of the individual (Wertsch 1998). For example, a student’s capability would extend in a different way depending on the resources they have, such as in an IT room.

Social cultural theorists present widely recognised strengths of this way of thinking. Firstly, the discourse’s evidence that social culturalism acknowledges the dissimilarities in individuals within cultures. Miller (2011) argues that the different historical circumstances may encourage different development routes depending on the tools available to the individual. Secondly, by broadening the social, cultural, and historical contexts, individuals are not isolated and a richer perspective on learning can be provided (Polly et al. 2017). Finally, this theory contributes to the theoretical understanding of learning and development. In exemplifying this point, we can consider the idea that the learning driving development is of fundamental importance in understanding the learning process and its educational implications (Miller 2011). However, there are limitations to the ideas developed from Lev Vygotsky’s work, most prominently due to the premature death of Vygotsky which meant that most of his theories were left incomplete. Due to political tensions between the Soviet Union and the West, most of Vygotsky’s work was not translated and largely unknown until recently. Another limitation is associated with the vagueness of the ZPD, for example, individuals have narrow zones which can be both
desirable and undesirable depending on the circumstances (Polly et al. 2017). Furthermore, individually knowing the width of the zone fails to provide an accurate perspective of one’s learning style and ability compared with the development of other children (Miller 2011). Cognitive development theorists, such as Rogoff (1990) argue that scaffolding is heavily dependent on verbal instruction and is thus not necessarily equally effective in all cultures and in all learning situations. Finally, it is still unknown whether a child’s ZPD can be compared to different learning domains, such as ‘remembering’ and ‘applying’.

Within the UK, there appears to be a shift away from mastering bodies of knowledge into the cultivation of transferable capabilities for real-life learning (Claxton and Lucas 2009). This is why the social cultural perspective becomes increasingly important- ‘as these skills cannot be taught to trained directly through instruction’ (Wells and Claxton 2006). Numerous skills that most adults want their children to acquire are learned primarily from being around people who demonstrate them (Claxton and Lucas 2009). The tools and attitudes learned allow children to express their development. This is not achieved by creating new programmes or adopting pedagogical styles, however by attention to the values and assumptions of culture. The current set up of classrooms may in fact deprive students from opportunities to develop their own resourcefulness.

2.4.2 Socio-cultural theory

There have been vast amounts of research on teaching and learning and much of this research has come from the perspective of the discipline of psychology. While there is nothing wrong in this, in some cases it can lead to what has been referred to as ‘psychologism’ (Trowler 2008). Psychologism can exaggerate psychological factors, and in an educational context, conceives that a person can exist in a cultural, historical, institutional, and micro-social vacuum (Trowler 2008). For example, the relationship between an individual and the context cannot have any institutional context because of the focus on the individual. The lens of Trowler’s
(2008) socio-cultural theory can be used to rebalance an understanding of the teaching and learning in their social contexts. The significance of this is that it allows teaching and learning to be viewed in an individual’s recurrent practices in a social rather than a purely individual context. Socio-cultural theory suggests that learning is a social process that stresses interactions between people. Cherry (2018) argues this further by suggesting that sociocultural theory is not merely about how adults and peers can influence individual learning, however there is also an additional focus on how cultural beliefs and attitudes impact how learning happens.

Trowler’s (2008) Socio-cultural theory can be summarized in six propositions. The first describes workgroups as developing ways of interacting and performing over a period of time, as shown below in Table 6.

<table>
<thead>
<tr>
<th>Table 6. Trowler’s (2008) first socio-cultural theory proposition.</th>
</tr>
</thead>
<tbody>
<tr>
<td>As workgroups engage in a common project over the medium-long term they develop a set of ways of behaving (recurrent practices), ways of understanding their world (taken-for-granted knowledge), and ideas about what is good and bad (values).</td>
</tr>
</tbody>
</table>

In other words, individuals are involved in the social construction of the common engagements they operate in, such as, teamwork, teaching, and collaborative planning. The individuals are continuously changing, developing and are able to separate ‘this’ and ‘that’ in their working practices by drawing from past practice, and subsuming new knowledge (Bowker and Star 1999). Trowler (2008) argues that conflicts and divisions often exist, however these are part of the social constructions too.

The second proposition states that objects, such as technology influence the way people interact with social reality, as shown below in Table 7.
People’s interactions with objects (artefacts, tools, technologies, devices) is socially meditated: the object themselves may influence the nature of social reality in significant ways, while their use at the same time is socially conditioned.


This proposition argues that it is the objects themselves that influence social reality, such as, policy drivers, curricula guidance and professional regulation (Wilford 2018). It is the nature of artefacts and how they ‘configure’ in the individual’s specific context that has a particular meaning and significance to the user. It is the teacher’s cultural relationship with technology that will determine how their social reality.

The third proposition highlights that texts in discourse are influenced by the people working in that team, as shown below in Table 8.

Table 8. Trowler’s (2008) third socio-cultural theory proposition.

Workgroups develop sets of discursive repertoires, which both express social realities and operate to constrain and delimit them: the production of text in discourse and the construction of reality work side by side, mirroring the operation of structure and agency in social interaction.

Teachers in subject and year teams create their own way of working within the confines of the school and senior leadership team (SLT), school, and wider political connect in which they operate.

The fourth proposition explains that individuals have their own way of working with the tools provided, as shown below in Table 9.


In terms of the project, they are mutually engaged on, workgroups develop unique ways of using tools available to them and a context specific understanding of aspects of their projects.

Individuals within subject departments may work collectively in the day-to-day delivery of curricula and assessment preparation, nevertheless they can operate in ways that are original and unique to them. Trowler (2008) argues that individuals can assemble unique mental models as they construct and negotiate knowledge to apply it to a task. On the basis that this department continues to collaborate, the intertwining relationships ought to be considered (Goffman 1967). The fifth proposition considers that individual identities are products of social contexts and social relations, as shown below in Table 10.

<table>
<thead>
<tr>
<th>Individual identities or subjectivities are similarly mediated and conditioned by social contexts. Our conditions or ‘self’ are partly the product of social contexts and social relations with the institutions we inhabit.</th>
</tr>
</thead>
</table>

Table 10. Trowler’s (2008) fifth socio-cultural theory proposition.

The identities of teachers are not merely constructed by their relationship with their subject teams but by their experience and background in education.

The sixth proposition illustrates the importance of a historical background on social life, as shown below in Table 11.

<table>
<thead>
<tr>
<th>The historical background or at least the narratives about the past constructed by participants, has very significant influences on the social life in the present</th>
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</table>

Table 11. Trowler’s (2008) sixth socio-cultural theory proposition.

A teacher’s historical experience, from their training year, to their professional practice in education are influencing the way they are practicing their pedagogy. Trowler (2008) argues that the ‘social context’ is a significant dimension of values and practices, and as a result any attempt to generalise the social context is oppressed. Trowler (2008) summarises ‘what is true in one place may not be the case in another’. Applying the
lens of the socio-cultural theory acknowledges a social perspective when looking at teaching and learning and allows us to reflect on the impact of the social context on individuals.

2.4.3 Practical applications

In recent years, socio-cultural theory has gained popularity in the education sector, and socio-cultural theory has become a commonly used conceptual framework (Mercer and Howe 2012). Social-culturalists such as Barnes (1976), Cazden (1972) and now Trowler (2008) have argued that if education practitioners want to improve students’ engagement and learning outcomes, the role of talk needs to be better understood. In secondary classrooms, teacher-student interaction is dominated by teacher monologue and ‘closed’ exchanges between teachers and students in order to seek the right answers to questions (Smith et al. 2004). Some questions in lessons are asked with a low cognitive level designed to funnel students’ responses towards a required answer. From a sociocultural researcher point of view (Trowler 2008; Smith et al. 2004; Barnes 1976; Mercer and Howe 2012; Wood 1992; Vygotsky 1920), the frequent use of questions from teachers is discouraged. International studies such as Wolf (2006) and Woods (1992) conclude that when teachers check students’ comprehension in a way that they have to answer Yes or No, or complete an incomplete sentence, students are not developing high level literacy skills. Sociocultural research argues that teachers should encourage students to put the main ideas of the lesson in their own words (for example ‘how did you know that’, ‘why do you think that?’), and thus overcome conceptions of the relationship between the forms and structures of classroom discourse and its educational functions (Mercer and Howe 2012). Cherry (2018) proposes some practical applications of how socio-cultural theory, as shown below in Table 12.

<table>
<thead>
<tr>
<th>Classroom examples</th>
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<tr>
<td>Teachers can plan their instruction and lessons. For example, the teacher might organize the class into groups where less</td>
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</table>
skilled children are paired with students who have a higher skill level.

Hints, prompts, and direct instruction can be used to help kids improve their ability levels.

Educators might also utilize the concept of scaffolding, where the teacher provides prompts to move the child progressively forward towards a goal.

Types of play that can further learning include imaginary play, role-playing, games, and re-enactments of real events. Such activities help foster the growth of abstract thought.

Table 12. Cherry’s (2018) practical applications of socio-cultural theory

Educators are now experimenting with new assessment tools, such as self and peer assessment, and proposing how they can be introduced into the curriculum. This significant social experiment treats peer and self-assessment in technical terms only: the effect they have on the provision of feedback; the development of evaluation skills; the effectiveness of assessment on group work; and questions around reliability and validity (O’Donovan et al. 2004). However, introducing these assessment tools will reshape relationships and power relations, changing the climate of the classroom including identities, and patterns of interaction (Trowler 2008). Thus, wider issues of power relationships, subjectivities, and a symbolic significance of change ought to be consider for successful implementation (Wertsch 1988 as cited in Trowler 2008).
2.4.4 Socio-cultural theory and TEL

Socio-cultural theory is the development of social dialogue that is characterised by intersubjectivity. Wenger (1998) as cited in Trowler (2008) suggests that a community of practice involves:

- Rapid flow of information...absence of introductory preambles as if conversations and interactions were merely the continuation of an ongoing process...knowing what others know...local lore, shared stories...jargon and shortcuts to communication and...shared discourse.

However, social practices too involve tools and resources, such as email and phone systems. The tools become important for workgroups to engage with recurrent practices and achieve sets of goals (Trowler 2008). There is an interactive process that occurs between the tools and context, meaning the tools are not completely distinct from the individual, and are in fact, ‘cultural tools’ that have been appropriated for the individual (Bakhtin 1981). For example, some Universities adopt a laissez-faire approach to the use of VLEs. The nature and extent of their use can be monitored according to the context (course), meaning their use can vary significantly (Trowler 2008). It would not make sense for sandwich courses to have the same level of use on a VLE as standard programmes, and the same can be argued between departments. It is possible for some new tools to be contested, resisted, or rejected. For some, the introduction of calculators in maths is a contentious issue, with some educators arguing that students are no longer ‘really’ doing maths (Wertsch 1998). The overall performance in students plus tools improves regardless of a change in abilities, therefore, as tools change so will the capabilities associated with them (Trowler 2008).

Mobile technologies have been playing an increasingly important role in learning and language in recent years. Socio-cultural theory argues that language is one of the most important cultural tools as it ‘mediates the relationship between the person and the environment
(Lantolf and Thorne 2007, p. 199). The prevailing mobile technologies are now an indispensable tool in how individuals interact and engage with other agents (e.g., teacher, peers, friends) in social and cultural activities (see Trowler 2008; Ma 2017). In addition, mobile technologies extend language learning from formal classroom settings to outside of class scenarios, combined with forming a personalised learning route. In other words, in traditional learning, the learner communicates directly with other agents (Ma 2007), and this remains unchanged in the technology era. However, as mobile technologies evolve, they serve as increasingly important tools to the individual. This is evidenced through the learning that takes place on Twitter, Skype, WhatsApp, and Google Drive (Chen and Chang 2011). New forms of communication support the perspective that tools are not completely distinct from the individual.

2.4.5 Learning spaces

The physical environment in which teaching and learning takes place imposes a degree of regularity on social practices, such as physical activity, mental activity, and states of emotional and motivational knowledge (Reckwitz 2002). The design of buildings are developed for our physical environment, although with thought into relations between people and spaces (Shove et al. 2007). Thus, the relationship between the environment and social practice is significant through the lens of socio-cultural theory. Many researchers have struggled in establishing what the environmental effects are on individual social behaviour (Temple 2007 as cited in Trowler 2008). One of the reasons for this is the multiple theoretical perspectives that are rooted in psychology, rather than sociology (Garling et al. 1991; Garling and Evans 1991), and this means that the generality of the term ‘environment’ is ambitious.

In recent years, learning spaces have been given a profile to raise awareness of environmental, social, and cultural issues. Yet, their effectiveness at communicating messages to students has not been studied extensively (Peacock and Pratt 2011). Much of the media
assumes that vastly expensive and lavishly resourced buildings are a suitable place to learn. Peacock and Bowker (2001) argue that the exciting structures can often distract focus from explicit learning objectives.

Successful educators who are reflective are aware of how layout, lightening, sound, amongst other environmental factors can impact on a learning experience. Yet, consideration to space often takes place in the context of architecture, rather than as an integral part of teaching and learning (Temple 2007). However, there are examples of learning spaces, such as, the digital classroom at Teesside University that address such issues in a thoughtful way. In contrast, there are several further examples (lecture theatres) that evidence the constraint between the architect’s preconceptions and the goal of effective teaching and learning (Trowler 2008). Beyond the classroom, the following have significant effects on the social dynamics of teaching and learning:

The presence or absence of a staff common room, the flow of people along corridors, the allocation of workrooms, the location of administrators to academics, whether the campus is distributed across the city (Trowler 2008, 44).

There is an acceptance from educators that ‘the learning landscape’ can create a sense of belonging, as well as facilitate group work and informal learning (Temple 2007). Trowler and Turner (2002) argue that new academics/teachers at institutions discover unexpected interactions with colleagues in the staff room and in corridors are increasingly beneficial, compared to formal work inductions. These interactions only occur and are only beneficial if the departmental layout is effective (Knight and Trowler 2001). In other words, social processes and culture form the way that learning spaces are used.

Young people vary in the ways they respond to their environment, ranging from strong identification, to uncertainty, to total rejection (see Titman 1994; Knight and Trowler 2001). For example, the size, content, and layout of a classroom impact on the type of interaction that
takes place (teacher-student, student-student, student-resource). Socio-cultural theory argues that learning spaces should allow children to interact with as many individuals as possible, and this goes beyond physical space. In a typical classroom, teachers and students are accustomed to working collectively, whereas TEL can provide scope for far larger interaction opportunities. Examples of this include, social media, web chats, and Skype. The online environment expands learners’ accessibility, meaning they have twenty-four-hour access to course resources. Situated cognition and reflective practice are two examples of learning that encompasses the social cultural framework.
CHAPTER 3 - METHODOLOGY

Using Guba and Lincoln’s (1994) characterisation of research paradigms, this chapter has been written using a post-positivism paradigm via a mixed methods perspective. Post-positivism has challenged traditional positivist world views by accepting that there is no absolute truth, and that our knowledge of the world is partial, conjectural, falsifiable, challengeable, provisional, probabilistic, and changing (Popper 1967; 1980). Although the author’s research background includes quantitative analyses, whereby there is less interpretation for the researcher, this study consists of large parts of qualitative research. Post positivist researchers (Popper 1968; 1980; Reichardt and Rallis 1994; Nisbett 2005; Philips and Burbules 2000) argue that certain ‘facts’ are often ‘value-laden’, which means the interpretations are determined by underlying theories. There is an acknowledgment in this piece of work that the results are drawn up an interpretation of data. Popper (1968 and 1980) argues that the world is multi-layered and must be able to tolerate multiple interpretations. The author has a professional background in education technology and there is an element of subjectivity that derives from this particular experience. Therefore, the concept of the world being multi-layered as a result of different values, perceptions and theories is embraced in this study.

This is not to suggest that empirical evidence cannot be accepted in this thesis, rather it is the identification of the values that similarly underpin the quantitative phase. Quantitative surveys used to highlight initial themes prior to the interpretation of qualitative data mitigate against the shortfalls of qualitative methods, and further supports the claims of credibility and trustworthiness in the research (Bryman 2021). Cohen et al. (2011) describes ontological assumptions giving rise to epistemological assumptions which subsequently give rise to methodological considerations such as data collection and analysis. Therefore, the author’s ontological and epistemological position has informed the methodology in this study.
Mixed methods research (MMR) combines elements of both qualitative and quantitative approaches and has often been branded as a ‘transformative paradigm’. The importance of MMR means that the author can combine knowledge sets and move away from any allegiance to a particular research perspective. Additionally, critical realism is a concept that does not assume answers can be found using a single methodology, rejecting realism and absolutism (Bryman 2021). Critical realism has been legitimised in both qualitative and quantitative research as it seeks an integral approach to research questions and philosophical perspectives, and this makes it a pertinent research strategy in this mixed methods research. McEvoy and Richards (2009, p. 67) explain:

Critical realism suggests that both quantitative and qualitative approaches are important to use in a single research project in order to fully explore and understand the structures and mechanisms of what can be observed and experienced.

Furthermore, the research aims have been developed through the lens of Trowler’s (2008) socio-cultural theory, and the notion of social interactions being critical for knowledge construction. Moreover, the author’s professional background is dominated by social ontological assumptions, which are primarily concerned with analysing the world that arises from social interactions. Therefore, there are some elements of social constructionism that make up the ontology of this thesis. In practice, the author acknowledges that there are multiple realities of phenomena, yet some overlapping features of commonality such as the quantitative data that is included within this study.

Education literature has often simplified arguments of epistemological assumptions by posing a simple dichotomy between positivism and post-positivism/interpretivism (Cohen, Manion and Morrison 2018). The author’s post positivist position rejects the belief of an epistemological position that applies solely strict scientific methods to research, and this
research is primarily concerned with understanding human behaviour through social interaction. This research accepts that teachers’ experiences and interactions with technology are critical to understand the phenomena.

This chapter content explores paradigms in research and examines the paradigms that are commonly associated with educational research. Historically, there have been active debates in the research community on what are referred to as the paradigm wars, and this will also be discussed in the chapter (Bryman 2021). Primarily, this chapter will justify the author’s methodological approach, including the research perspective that is adopted, the research design, the data collection, and the data analysis.

The following section will also illuminate the good practice that is involved in social science research, including reliability and validity, and the important considerations that ought to be undertaken in mixed methods research. Finally, the author will present reflections on the research journey thus far, including a personal account on what has been learned whilst writing this chapter and the impact that this has on research practice. This reflexive account acknowledges the author’s own perspectives whilst recognising how practice is multi-faceted (Bryman 2021).

3.1 Paradigms

Educational research has several competing views of the social sciences, and these are often referred to as paradigms. Hammersley (2013, p. 13) portrays paradigms as ‘not simply methodologies; they are ways of looking at the world, different assumptions about what the world is like and how we can understand or know about it’. In other words, a paradigm is a way of pursuing knowledge through a shared set of beliefs and principles (Hammersley 2013; Kuhn 1962). Paradigms can be summarised by the three following fundamental questions, 1) the ontological question, 2) the epistemological question, and 3) the methodological question.
Lukenchuk and Kolich (2013) argue that the term ‘paradigm’ was popularised and given a contemporary meaning by the theorist Thomas Kuhn (1970) when he adopted the word to refer to a set of practices and beliefs that define a scientific discipline. A fundamental characteristic of paradigms is that they are significant in underpinning researchers’ approaches to methodologies. However, as further knowledge is assimilated it is possible to challenge existing paradigms and make a ‘paradigm shift’. Cohen, Manion and Morrison (2018, p. 8) describe one of the most notable examples is the old paradigm that Earth is placed at the centre of the universe, only to be replaced by the Copernican heliocentric model through the scientific revolution period. Simply put, the science of their day could not describe what the scientists could observe. Prior to Kuhn (1970), positivism and the concept of objective reality only existing if elements are available for observation was accepted by parts of the research community (Popper 1968).

Nevertheless, there remained a tradition on continental Europe before positivism as with philosophers Hegel, Husserl, Heidegger, Sartre, Merleau-Ponty and others, and ideas of phenomenology as ‘a science of consciousness rather than of empirical things’ (Husserl 1963 as cited in Smith 2013). In the 1970s, Kuhn (1970) contributed to these ideas and challenged the processes derived with knowledge from empirical evidence, and instead recognised the ‘social and cultural character of research’ for cumulative research. Kuhn (1970) as cited in Hammersley (2013, p. 39) argued that rather than natural science research ‘gradually accumulating, with errors being corrected and new discoveries adding to further knowledge…processes are discontinuous, punctuated by paradigmatic revolutions involving disagreement that cannot be resolved at the time of rational means’, for example, the move from Newtonian physics to Einsteinian and quantum physics. In contrast, social science research must have independent actors and social worlds in order for the social construction of it to make sense (Pring, 2015).
Guba and Lincoln (1994) argue that paradigms as a world view guide a researcher, not only in choices of methods, rather in ontological and epistemological ways. This allows the author to confront complex and important issues of ethics, ontology, epistemology, and methodology before giving a concrete shape to research.

Rather than paradigms driving the research, they provide clarity on the purpose and nature of research and help to organise thinking about the research (Cohen, Manion and Morrison, 2018). Nevertheless, paradigms are not unproblematic concepts, for example, there are many variations that lie within each paradigm, as well as characteristics that overlap the different types, and thus the author found it important to understand traditional boundary lines. Social science researchers and theorists (Denzin and Lincoln 2002; Denzin and Lincoln 2005; Patton 2000) have argued that the boundary lines separating the paradigms and perspectives have begun to blur, especially within the last decade. Despite this, the following section will set out the four paradigms commonly accepted in educational research: positivism, post positivism, interpretivism and critical theory. Moreover, the author has originated from a quantitative research background, thus, this is examined to illustrate the process of moving towards a post positivist way of thinking about research.

3.1.1 Positivism

The characteristics of positivism suggest that social phenomena can be researched in a similar fashion to that used in natural sciences, through empirical investigation. This position argues that genuine knowledge must be based on sensory experiences (Oldroyd 1986; Hammersley 2013; Pring 2015; Beck 1979; Cohen, Manion and Morrison 2018). The approach abandons attempts to gain knowledge by reason alone and instead reveals that social facts must be evidenced empirically (Beck 1979). Although, there is an emphasis on observational evidence, operationalism, and scientific method, Hammersley (2013) argues that positivism is not exclusive to quantitative approaches and can be equally embraced in qualitative data.
Positivist analysis has been described as ‘laws or law-like’ generalizations by researchers (Cohen, Manion and Morrison 2017 and 2018; Hammersley 2013) due to the importance of natural science in the methodological procedures. Notwithstanding, positivism is less successful with research that involves human behaviours, and this is primarily due to the intangibility of the phenomena and complexity of human nature (Cohen, Manion and Morrison 2018). In general, positivism regards human behaviour as regular, predictable, and not social, fluid nor dependent on a set of circumstances. In other words, studies that involve human interaction such as teaching and learning present positivist researchers with challenges, and this is particularly relevant in the present research.

There are four assumptions that underpin positivism and these are 1) determinism, 2) empiricism, 3) parsimony, and 4) generality. Firstly, determinism is the assumption that events have causes and circumstances determine the natural world. Secondly, empiricism assumes that reliable knowledge can only be derived from experiences, such as observations. Thirdly, parsimony is the assumption that the phenomena should be explained simplistically rather than in complex terms, and this is particularly critical when discussing theory development. Finally, generality is the assumption that there is a relationship between the abstract and the particular. Kerlinger (1970) argues that scientists are set up to generalise their findings to the world in order to support their explanations. This means that social scientists require large sample sizes and must ‘exercise great caution when generalising their findings to the population’ (Cohen, Manion and Morrison 2018, p. 11).

Despite the benefits and successes of positivism, there remains significant critique of positivism and empirical realism (as in Kettley 2012; Douglas 2004; Popper 1968, 1980; Bhaskar et al. 1998). Essentially, criticisms are focused on its epistemological and ontological basis, and Kuhn’s (1970) opposition to the verifiability principle. Kuhn (1970) argued value free knowledge in unattainable, and that normal science was work governed by a relatively
stable set of theories and practices, undermining positivism. In other words, science isn’t particularly critical as evidenced via the breadth of theories that remain widely accepted.

Ions (1977) argues that statistical theory and method are ways of quantifying human acts, and this runs the risks of depersonalisation. Ions (1977) concludes that quantifying isn’t necessarily negative per se, however, objections are made to what Horkheimer (1972) and Roszak (1970; 1972) refer to as the pursuit of objectivity as something isolated away from our true self. Another collective criticism is levelled at positivism in social science which fails to take into account an individual’s ability to interpret experiences (Pring 2015). In other words, how each human understands and experiences the world is, to some extent, different and this has to be recognised in the social world.

Unlike natural sciences, social science is a subject-subject relation in which the meanings that the subjects hold are part of their construction of the world (Giddens 1976). The difficulty with positivism is that it ignored the profound differences of social science and natural science, and by regarding human behaviour as passive and controlled there is no scope for intention, individualism, and freedom (Chomsky 1959 as cited in Cohen, Manion and Morrison 2018). In conclusion, scientific experimentation that appears to control variables and simplify the social world through quantification is increasingly likely to provide an artificially deterministic view of the world (as in Layder 1995; Cohen, Manion and Morrison 2018; Pring 2015; Horkheimer 1972).

3.1.2 Further research paradigms

Post-positivists embrace scientific theory and rationalism, yet acknowledge too that there are multiple interpretations of a world view. Popper (1968 and 1980) argues that the world is multi-layered and must be able to tolerate multiple interpretations. The world is viewed as multi-layered as a result of the different values, perceptions and theories that underpin empiricism, for example, as in observations. In other words, post positivists view reality
external to human consciousness in addition to believing that the production of knowledge is a social process, and this is in contrast to positivism. Knowledge is inter-subjective and constructed from things that do not change and are part of ‘reality’, such as gravity, and the things that change, such as the human processes that establish the understanding and implications of discovery. In essence, the previously accepted subject-object relation becomes redundant in replace of a subject-subject one.

Additionally, post positivist researchers (Popper 1968 and 1980; Reichardt and Rallis 1994; Nisbett 2005; Philips and Burbules 2000) argue that certain ‘facts’ are often ‘value-laden’, which means the interpretations are determined by underlying theories. Many of these arguments become the epistemological and ontological basis for opposition against logical positivism (Kuhn 1970).

The present research is studied through the lens of Trowler’s (2008) socio-cultural theory, with the concept of social interactions being necessary for learning as an underlying theoretical approach. An example of this is illustrated in Cohen, Manion and Morrison (2018, pp. 16-17):

Imagine that a researcher observes a class lesson and notices one student winking at the teacher. Is this student being cheeky (a theory of deviant or challenging behaviour), a sign of understanding (a theory of cognition/recognition), a physical problem (Tourette’s syndrome), a sign of stress or happiness (a theory of emotional behaviour), a sign of friendliness (a theory of interpersonal non-verbal behaviour), or what? The observation on its own cannot tell us. There is a gap between an observed phenomenon and the explanation or theory of, or a hypothesis about, the phenomenon.

This example supports post-positivists’ claims that observations cannot and should not count as evidence alone, without additional help from non-sensory experience such as the researcher’s viewpoints (Philips and Burbules 2000). In this example, it is inevitable that there
is an interpretation of the observation, therefore, the interpretation is based on interaction, and with contrast to positivism, the subject-object relationship is replaced with a subject-subject one.

This emphasises the importance of using Trowler’s (2008) socio-cultural theory as a theoretical position. Viewing the world as a post-positivist acknowledges that the social world is epistemologically problematic, whilst arguing that the scientific method can present research value if ‘reformulated’ with theory-laden nature (Cohen, Manion and Morrison, 2018).

Most objections to positivism are based on a belief that human social behaviour is not governed by universal laws, and this view has been highly commented on in the literature from Beck (1979) and Kuhn (1970) to Creswell (2013) and Moschkovich (2019). More specifically, there is a viewpoint that due to the importance of theoretical frameworks, it is not possible to achieve objectivity in exploring the social world (Guba 1990). An interpretivist paradigm assumes that knowledge and meaning are constructed by both the participants and observers, with scholars such as Moschkovich (2019) describing naturalism as in effect, accepting that there are multi-faceted realities. Interpretations of reality are shaped by multiple theoretical and value frameworks (Guba 1990). According to Guba (1990, p. 26) and Erlandson (1993), the goal of interpretivist research is ‘to identify the variety of constructions that exist and bring them into as much consensus as possible’. In order to fulfil the goal, an interpretivist stance must take a holistic view in understanding the participants’ interpretation of the world, i.e., social reality as defined by the participants. The differences in methods between positivists and interpretivists paradigms are illustrated in Table 13 below.

<table>
<thead>
<tr>
<th><strong>Positivism</strong></th>
<th><strong>Interpretivism</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>One real world</td>
<td>Multi-faceted reality</td>
</tr>
<tr>
<td>Seeks generalisations</td>
<td>Seeks patterns</td>
</tr>
<tr>
<td>Objective and quantifiable</td>
<td>Inter-subjective and non-quantifiable</td>
</tr>
<tr>
<td>Usually measured- statistical analysis</td>
<td>Qualitative analysis</td>
</tr>
<tr>
<td>Researcher verification</td>
<td>Participant verification grounded on interpretations</td>
</tr>
</tbody>
</table>
Table 13. The differences between a positivist and naturalist paradigm.

In other words, interpretivism is concerned with the ‘how’ and ‘why’ of a phenomenon, whereas positivism is focused on the absolute. Some scholars argue that interpretivism and post-positivism ‘abandon’ the scientific procedures needed for useful generalisations of behaviour (Cohen, Manion and Morrison 2017, 2018). An example of this in an education setting is if a teacher perceives a pupil to be of low ability purely due to data on a test score, they will act and behave as if that pupil is low ability. Nevertheless, the teacher’s perception may differ if they become informed by additional subject-subject interaction, with supplementary interpretation viewing the pupil as high ability and requiring further challenge in tasks. In essence, positivism is an oversimplified and depersonalised approach that is incompatible with the complexities of classroom life. Conversely, a different teacher may have an alternative perception of the pupil, thus subjective reports are often misleading (Bernstein 1974). An additional scientific method or positivist approach would be to look at previous assessment scores.

3.1.3 Ontology and Epistemology

The following section will provide an overview of ontology and epistemology in educational research. Additionally, this section will describe my own position in respect of these philosophical concepts. This subsection which is an overview of ontology and epistemology will evidence how these positions have influenced the methodological decisions that have been made during the research.

Cohen et al. (2011) argue that ontological assumptions help form an epistemological position which can subsequently give rise to methodological considerations such as data collection and analysis. Furthermore, Creswell (2013) states that these philosophical assumptions guide the researcher in the formulation of research questions, in addition to enabling researchers to seek the information that is needed in answering these research
questions. Therefore, my research methodology is informed by my ontological and epistemological position, which governs the construction of my research questions, my research design and the research methods. The relationship between ontology, epistemology, methodology and methods is presented in figure 3 below.

![Diagram of the relationship between ontology, epistemology, methodology and methods]

**Figure 3. The relationship between ontology, epistemology, methodology and methods (Coe et al. 2017).**

In considering ontology we question assumptions about the nature of reality, to determine the ‘ways things are’ and often explore the cause effective relationship between social reality and the properties that underpin it (Guba and Lincoln 1994). Furthermore, Denzin and Lincoln (1994) argue that it is crucial to consider a researcher’s personal sentiments, beliefs, and relationship to the subject matter, and this has been considered in this research. Social scientists usually distinguish two types of ontology in their research, philosophical ontology, and social ontology. Philosophical ontology is concerned with the state of reality, in other words, what is real (ontological realism) and what is not real (ontological idealism). In contrast, social ontology, often referred to as ‘social actors’ in ontology, differs as the debate switches to single
reality versus multi-faceted reality. There are different research perspectives on social ontology and whether social entities should be considered objective, that is that they have a reality different to social actors, or if they should be considered social constructs made up by social actors (Bryman 2008). These positions are referred to as objectivism and constructionism.

Firstly, objectivism is the belief that social phenomena exists as social facts and they are independent from social actors in research; an example of this are cultural differences. Therefore, the ambition of objectivists in ontology is to align with the natural sciences to identify fundamental laws that explain regularities in human behaviour (Easterby-Smith et al. 1991, p. 23). It has been previously mentioned that although a positivist view does hold merit in natural sciences, in social sciences it is widely accepted that human behaviour can be unpredictable, and subjective (Bryman 2021). Thus, this ontological position is not suitable for the present research.

In contrast, a constructionist point of view argues that social phenomena exist but their nature is dependent on social actors. Bryman (2008) argues that the social phenomena are under constant construction and revision due to their characteristic of being created and maintained by groups or individuals. This is a counter belief to objectivism with the end goal of understanding the phenomenon in a contextual setting. The present research is underpinned by the idea that social interactions are important for learning, and this supports a constructionist and critical realist ontological position. Furthermore, the research aims to examine social lives through the lens of a particular theorist, specifically, Trowler’s (2008) socio-cultural theory. This type of approach is mostly associated with qualitative methods as it aims to gain insights into the realities which are constructed by research participants in various contexts. By adopting this ontological viewpoint, I have developed an increasingly post-positivist and interpretivist view of conducting research.
Epistemology has been defined as a branch of philosophy that studies the concept of knowledge and attempts to ‘distinguish between ways of knowing what is ‘true and adequate knowledge’ and ‘false and inadequate knowledge’ (Erikson and Kovalainen 2008, p. 14). In other words, it is the researcher’s relationship with the production of what is to be considered as knowledge. Therefore, epistemology is concerned with the different methods of gaining knowledge by asking three fundamental questions: What is knowledge? Can we have knowledge? And, how do we get knowledge?

Post-positivism rejects the belief of an epistemological position that applies solely strict scientific methods to research, and is primarily concerned with understanding human behaviour through social interaction (Bryman 2021). Additionally, post-positivists argue that humans are influenced by their experience of the environment (Walliman 2006). This is quite pertinent within this research as interviews are socially structured forms of collecting data. Therefore, post-positivists are often critical realists in ontological terms as they both acknowledge that structures and mechanisms can generate what is perceived as being real (Bryman 2021). To understand one’s behaviour on social media, for example, a researcher must understand the social and cultural world view of that person. More specifically, this context may be informed by previous experience and interactions with colleagues or friends online, any professional development which may embed an element of digital literacy, or even the culture, for example, most western social media platforms are banned in China. These perspectives support the notion of reality being multi-layered as with constructivism or critical realism.

The methodology was profoundly influenced by the ontological and epistemological stances taken in this early part of the research process as they are both heavily associated with qualitative research. I am exploring teachers’ viewpoints and behaviours by understanding the experiences they have with technology. In this respect, interviews provide an opportunity for participants to describe their interpretations of the world in both verbal and non-verbal means.
Denscombe (2014) argues that interviews allow participants to express their perspectives of the world through their unique viewpoint. Thus, interviews lend themselves well to my ontological and epistemological position. Thematic analysis is flexible for new researchers, whilst allowing various epistemological positions to be applied; and this is useful as there are specific theoretical viewpoints that have underpinned this work. Braun and Clarke (2006) argue that thematic analysis can free the researcher from theoretical commitments as it allows for data to be interpreted.

The methodology was shaped by the principles of my ontological and epistemological positions, the nature and value of the information being sought, and the use of MMR to obtain credibility and trustworthiness in the study. Upon examining these viewpoints, I have adopted elements of both post-positivist and critical realist epistemology and a constructivist ontology via a mixed methods perspective. My previous experience in the education technology domain has shaped the lens that the research is viewed in, and interpretivism allows me to acknowledge this. Trowler’s (2008) socio cultural theory is underpinned throughout this research, yet nonetheless, positivism does support the socially neutral element of the PhD research.

3.1.4 Paradigm wars

A particular research phenomena often dictates the methodology that is used to address the question or problem. There is much concentration on the ‘what’ when discussing research methodologies as opposed to the ‘why’. Oakley (1999) argues that there are underlying reasons that dictate a choice of methodology that go beyond the research question, more specifically, philosophies, and long-held epistemological views on social science research. Thus, a methodological decision is often affected by the paradigm lens and social context. There are two different positions on this debate, and these are: 1) quantitative and 2) qualitative.

Schwandt (2000, p. 189) argues that ‘qualitative enquiry practitioners share a general rejection of the blend of scientism, foundational epistemology, instrumental reasoning, and the
philosophical anthropology of disengagement that has marked mainstream social sciences’, and that qualitative approaches help in addressing the ‘why and how’ of a particular research phenomenon. According to Denzin and Lincoln (1994, p. 2), qualitative research is ‘multi-method in focus’ that involves the collection of a variety of materials such as ‘case study, personal experience, introspective life story, interview, observational, historical, interactional and visual texts that describe routine and problematic moments in individuals’ lives’. In application, qualitative research has been used by scholars to move thinking beyond progressive action and into methods that connect pedagogy and ethics to ‘action in the real world’ (see Denzin and Lincoln 2005, p. 5). Despite the term ‘qualitative’ being associated with processes that are not rigorously examined or measured in terms of quantity or intensity (Mahapatra 2005), qualitative research is well developed as an approach in terms of its consideration of issues of credibility and rigour (Perakyla 1997; Kirk and Miller 1986). In contrast, quantitative research emphasizes the importance of the measurement and analysis of causal relationships between variables, not processes (Denzin and Lincoln 1997). Quantitative studies are largely dependent on tests and ratings, such as questionnaires, scales, and physical measures. Therefore, it can be concluded that while numbers are the end product of a quantitative researcher, the narrative description of events are the end result of qualitative research (Landy and Conte 2004; Strauss and Corbin 1990; Mahapatra 2005).

Historically, there has been a heavy emphasis placed on quantification in the sciences, for instance mathematics is often described as the ‘queen of sciences’ (see Guba and Lincoln 1994), whereas less quantifiable sciences, such as biology are referred to as ‘soft’, which gives the impression it is less dependable than physics or chemistry. During the 1960s, an emergence of social science researchers critiquing quantitative methods was highly visible in the literature (see Bryman 1988; Cicourel 1964), and consequently there emerged an appetite for collecting social science data in other forms, i.e., in qualitative ways (Oakley 1999; Hammersley 1989).
Despite the validity and importance of both types of research, the different epistemological and ontological positions have punctuated research capacity and academic development. This philosophical discourse has led to the rise of the term ‘paradigm wars’ with some academic commentators using war-like terminology to describe positions, such as ‘enemies’, ‘opposing armies’, and ‘treat former enemies with suspicion’ (see Bryman 2006; Griffiths and Norman 2013; Polio 2012). Essentially, the ‘paradigm wars’ boils down to a simple conflict between academics and scholars of qualitative and quantitative research which concerns the relative merits of the different perspectives. In the 1980s, the prevalence of the objectivity-seeking quantitative researcher diminished, whilst post-positivists, interpretivists and critical theorists began to flourish throughout this same period despite the historically very conservative area of academic life (see Gage 1989; Griffiths and Norman 2011). In education, using scientific methods to improve teaching had not ‘paid off’ and researchers began arguing that human affairs cannot be studied with the same scientific methods used to study the natural world (Gage 1989). Tom (1984) argues that qualitative methods might yield insights that searching for predictions does not. It is argued that studies should recognise the complexity of science and philosophy not being inextricably linked (Griffiths and Norman 2013; Hammersley 2013). In 2006, Bryman declared that ‘the war was over’, however, Griffiths and Norman (2013 p. 584) argue that hostility has not ‘ceased on all fronts’ and this is evidenced by present day research publications promoting new frameworks and guidance to end the paradigm wars.

Interestingly, mixed methods, which integrates quantitative and qualitative data in a single project continues to emerge and dominate the spectrum, and in some ways this has resolved the debate. Mixed methods argue for their compatibility or at least their ability to live alongside each other and to work collectively to solve a problem. Reams and Twale (2008, p. 133) further argue that mixed methods are necessary and important in addressing information and perspectives, and that they ‘increase collaboration of data, render less bias and more accurate
conclusions’. The rise of mixed methods research demonstrates that there is an interest in embracing varied approaches to collecting and analysing data in the social sciences. Polio (2012) argues that as future researchers begin to talk about the purpose of the research rather than the paradigm, it opens the door for mixing orientations and this is a way to move ‘beyond the paradigm wars’ (p. 294), which is particularly relevant in the present research. However, Polio (2012) does add caution in respect of how little has actually changed in many academic disciplines and urges qualitative researchers to embrace the concept of paradigms once again and ‘reclaim the paradigmatic stance’ and work towards integrating these elements with work that complements other paradigms. Guba and Lincoln (1994) affirm that both qualitative and quantitative methods may be used appropriately with any research paradigm, though interpretivist and critical theory paradigms are central to qualitative research. In conclusion, researchers need not become aware of the paradigm debate; ‘as long as we know what we are dealing with in mixed methods research then this may suffice’ (Cohen, Manion and Morrison 2018).

3.2 Methods in social sciences

Research methods can be described as either ‘fixed’, which means that the researcher does not diverge from a planned sequence or process, or ‘fluid’, which means that the research process is transparent for modification (Curtis and Curtis 2011). The present research adopts a slight fluid approach by applying Guba’s (1994) definition of a post-positivist paradigm. In addition, the further use of qualitative methods in this research has enabled a degree of fluidness and constructivism. The research aims and objectives are to:

1) examine the current relationship between social networking sites and pedagogy
2) distinguish factors that influence teacher engagement with social networking sites in their pedagogical practice
3) determine, using a mixed methods approach, whether or not social media engages students and enhances academic performance and the degree of which this is compared with traditional teaching methods

4) design a framework for teachers to follow when implementing social media strategies in the classroom.

MMR combines various elements of both quantitative and qualitative approaches together, with the purpose of providing an increasingly rich and reliable understanding of a phenomenon. Thus, a combination of quantitative and qualitative data collection, analysis, and interpretation will be discussed in this chapter and a justification provided. After exploring the general models of research that are available to researchers early in their careers, it became clear that MMR opened doors beyond traditional paradigm boundaries.

3.2.1 Interviews

Interviews are a widely used instrument for data collection, allowing participants to communicate everyday meanings into recognisable and ordered reality through reflection (Gubrium and Holstein 1997). Essentially, an interview is an ‘interchange of views between two or more people on a topic of mutual interest’ (Kvale 1996, p. 14), which is central for knowledge production and research data. Whilst interviews are conversations that produce empirical data, this is in contrast to an everyday conversation that does not have a specific purpose and isn’t question based (Dyer 1995). Cohen, Manion and Morrison (2018) identify that there are two approaches to interviews, the ‘miner’, who believes that the interviewee has the information and is concerned with the nuggets of material, and the ‘traveller’, who sets out a journey to discover knowledge with no direct route. In other words, miners extract knowledge, whilst travellers co-construct knowledge (Kvale 1996). With consideration to this, I have adopted a slight ‘miner’ approach to the interviews with key pieces of information used in the analysis derived from asking interviewees about their lived experience of TEL and social
media. I argue that interviews can do what surveys cannot do, which is to explore why people frame their ideas and make connections between ideas, values, events, and opinions. Additionally, interviews merit a higher response rate than questionnaires because respondents become increasingly involved, and thus further motivated (Oppenheim 1992). There are multiple purposes of an interview, however, regardless of the purpose, they are similar by the fact that there remains a constant transaction of information taking place. More specifically, there are three research purposes that an interview may serve 1) a means of gathering information to serve the research objectives, 2) to test a hypothesis, and 3) in conjunction with other research methods (Tuckman 1972 as cited in Cohen, Manion and Morrison 2018). An interview is flexible, ranging from formal standardized and structured to informal unstructured, albeit ‘unstructured’ is somewhat inaccurate to describe questions that been pre-determined.

The strengths and weaknesses of different types of interviews are shown below in Table 14 (Patton 1980, p. 206).

<table>
<thead>
<tr>
<th>Type of interview</th>
<th>Characteristics</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal conversational</td>
<td>Questions emerge from the immediate context and are asked in the natural</td>
<td>Increases the salience and relevance of questions; interviews are</td>
<td>Different information collected from different people with different</td>
</tr>
<tr>
<td>interview</td>
<td>context and are asked in the natural context and are asked in the natural</td>
<td>built on and emerge from observations; the interview can be matched to</td>
<td>questions. Less systematic and comprehensive if certain questions don’t</td>
</tr>
<tr>
<td></td>
<td>course of things; there is no predetermination of question topics or wording.</td>
<td>individuals and circumstances.</td>
<td>arise ‘naturally’. Data organization and analysis can be quite difficult.</td>
</tr>
<tr>
<td>Interview approach guide</td>
<td>Topics and issues to be covered are specified in advance, in outline form;</td>
<td>The outline increases the comprehensiveness of the data and makes data</td>
<td>Important and salient topics may be inadvertently omitted. Interviewer</td>
</tr>
<tr>
<td></td>
<td>interviewer decides sequence and working of questions in the course of the</td>
<td>collection somewhat systematic for each respondent. Logical gaps in data</td>
<td>flexibility in sequencing and wording questions can result in substantially</td>
</tr>
<tr>
<td></td>
<td>interview.</td>
<td>can be anticipated and</td>
<td>different responses,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Interview</td>
<td>Strengths</td>
<td>Weaknesses</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Standardised open-ended interviews</td>
<td>The exact wording and sequence of questions are determined in advance. All interviewees are asked the same basic questions in the same order.</td>
<td>Respondents answer the same questions, thus increasing comparability of responses; data are complete for each person on the topics addressed in the interview. Reduces interviewer effects and bias when several interviewers are used. Permits decision makers to see and review the instrumentation used in the evaluation. Facilitates organization and analysis of the data. Little flexibility in relating the interview to particular individuals and circumstances; standardized wording of questions may constrain and limit naturalness and relevance of questions and answers.</td>
<td></td>
</tr>
<tr>
<td>Closed quantitative interviews</td>
<td>Questions and response categories are determined in advance. Responses are fixed; respondent chooses from among these fixed responses.</td>
<td>Data analysis is simple; responses can be directly compared and easily aggregated; many short questions can be asked in a short time. Respondents must fit their experiences and feelings into the researcher’s categories; may be perceived as impersonal, irrelevant, and mechanistic. Can distort what respondents really mean or experienced by so completely limiting their response choices.</td>
<td></td>
</tr>
</tbody>
</table>

Table 14. Patton’s strengths and weaknesses of different types of interviews.

Planning an interview involves sampling, question type, the design of the interview and who is being interviewed (Cohen, Manion and Morrison 2018). Kvale (1996) had originally set out seven stages of an interview that includes thematizing, designing, interviewing, transcribing, analysing, verifying, and reporting, however, Cohen, Manion and Morrison
(2018) propose a new and extended ten-stage sequence for planning an interview, which is accepted in the present study. Table 15 expresses the ten stages of an interview below.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Thematizing</td>
<td>The purpose of the research is decided at this stage. General goals and objectives are translated into more detailed research questions.</td>
</tr>
<tr>
<td>2) Designing</td>
<td>Research questions are translated into actual questions that will make up the main body of the interview schedule.</td>
</tr>
<tr>
<td>3) Construction of schedules</td>
<td>The question types are decided at this stage. For example, open ended, closed, multiple choice.</td>
</tr>
<tr>
<td>4) Question formats</td>
<td>Different question and answer types are examined at the stage. For example, a researcher may ask a direct question, or adapt it following the respondents answer to a previous question.</td>
</tr>
<tr>
<td>5) Response modes</td>
<td>Just as there are varied ways of asking a question, there are several ways a response can be sought.</td>
</tr>
<tr>
<td>6) Conducting the interview</td>
<td>In this stage, the interview is set up and conducted, including the consideration of people, the location, time, timing of an interview (Mills 2001)</td>
</tr>
<tr>
<td>7) Transcribing</td>
<td>This is a crucial step when interviewing as this becomes the record of data. There is potential for massive data loss without transcribing.</td>
</tr>
<tr>
<td>8) Analysing</td>
<td>Scoring, coding, or content analysis.</td>
</tr>
<tr>
<td>9) Verifying</td>
<td>Validating results using reliability and validity tests.</td>
</tr>
<tr>
<td>10) Reporting</td>
<td>The nature of the reporting is determined by the nature of the interview. For example, structured interviews that yield numerical table may be presented in tables and graphs.</td>
</tr>
</tbody>
</table>

Table 15. Cohen, Manion and Morrison (2018) ten-stage sequence for structuring and planning interviews.

3.2.2 Questionnaires and surveys

In this thesis, I acknowledge that questionnaires and surveys are a widely used research tool that offers standardised responses to a range of topics. Cohen, Manion and Morrison (2018, p. 471) describe some of the benefits of them as including that they are ‘cheap, reliable, valid,
quick and easy to complete’. Questionnaires can offer both qualitative and quantitative data from small and large samples which can often be straightforward to analyse. The literature indicates that to reap the benefits of questionnaires, they must be presented in straightforward ways, comprehensible at first glance, concrete, specific, and unambiguous to answer (as in Wilson 1996). There are ethical considerations to questionnaires in light of respondents being subjects as opposed to objects of research. For example, respondents cannot be coerced into completing a survey or questionnaire, their anonymity must be guaranteed, and it is important to avoid bias (i.e., capturing what the respondents want to discuss rather than promoting the researcher’s bias as with leading questions, as in Cohen, Manion and Morrison 2018). It is also important to consider the demands of the respondent by avoiding and relying on heavy recall questions, particularly with sensitive issues. There are staged sequences to planning a questionnaire and this could take months for a researcher to devise, however analysis could be comparatively rapid. The sequences have been applied in the present study and are shown below in Table 16.

<table>
<thead>
<tr>
<th><strong>Stages in questionnaire design</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Defining the objectives of the questionnaire</td>
</tr>
<tr>
<td>Formulating the research questionnaires</td>
</tr>
<tr>
<td>Defining the target population</td>
</tr>
<tr>
<td>Confirm sampling timelines</td>
</tr>
<tr>
<td>Decide the responses required (e.g., questions, scales, measures)</td>
</tr>
<tr>
<td>Write the questionnaire</td>
</tr>
<tr>
<td>Address length and format issues</td>
</tr>
<tr>
<td>Pilot and refine questionnaire</td>
</tr>
<tr>
<td>Administer final questionnaire</td>
</tr>
<tr>
<td>Send reminders</td>
</tr>
</tbody>
</table>
There are three main types of questionnaires, structured, semi-structured, and unstructured, with researchers opting for an increasingly structured, closed, and numeric questionnaires in large sample sizes and less structured, more open, and word-based questions in small sample sizes (Champagne 2014). With a large sample size, the present study applied structured questions in the survey, although there is a debate among the terminology used when describing questionnaire types. Some scholars (Denscombe 2014; Cohen, Manion and Morrison 2018; Rattray et al. 2004) have argued that it is misleading to describe a questionnaire as ‘unstructured’ due to the amount of heavy time dedicated to devising a questionnaire, in addition to the structure itself containing a list of questions. Open ended questions have been attractive for small-scale and qualitative research projects, as they offer an invitation to be honest and may provide ‘gems’ that otherwise might not be caught in the questionnaire. Open-endedness puts further responsibility on the respondent as opposed to closed questions, therefore, it may be useful for a researcher to provide some support for the respondent. This support could be in the form of prompts, such as ‘please include the strengths and weaknesses of mobile phones in classrooms’, to sentence openers, such as, ‘the main things that I like about social media are….’ (as in Oppenheim 1992). Krosnick and Presser (2010) contend that although open questions enable participants to respond in their own terms, it can lead to far greater, irrelevant, and redundant information than closed questions. Furthermore, open questions can appear long and discouraging, and often have low response rates (Krosnick and Presser 2010). Notwithstanding the downfalls to open questions, they provide a window of opportunity for a participant to shed light on an issue, and generate exploratory responses. Nevertheless, there may be alternative forms of data collection such as interviews that are viewed as appropriate for the purpose of generated exploratory responses.
Closed and structured questions are a highly useful way to generate responses that are convenient to statistical analysis, such as, descriptive statistics. Oppenheim (1992) and Bailey (1994) argue that closed questions are quick to code and analyse and enable comparisons to be made within subject groups. I consider that in general, closed questions are much more straightforward to answer than open ones and that this helps the respondent to answer the question relatively easily. Thus, in this survey questions are closed in nature, whilst the opportunity for open, and exploratory responses were adopted in the interviews. However, it is widely accepted that when rich and personal data is sought, open questions are more suitable (Cohen, Manion and Morrison 2018; Oppenheim 1992).

The metrics that are used in questionnaires directly affects any statistical analysis, thus, a researcher must carefully adopt an appropriate scale of data, of which there are five main types. Nominal data captures responses of categories, for example, ‘What is your gender? Male/Female’ and is primarily used for categorisation of subject variables and preferences, whereas, ordinal data captures ordered or ranked responses, such as, ‘Rank the following pedagogical tools from most important to least important’. Interval questions captures data using a numeric scale, for example, ‘How satisfied are you with EdTech at your school? 1= extremely unsatisfied, 2= unsatisfied, 3= neutral, 4= satisfied, 5= extremely satisfied’, in contrast, ratio level of measurements also use a continual scale but have a true zero, for example ‘How many times a day do you use your social media? a) 0 hrs, b) <3hrs, c) 3-5hrs, d) 5-9 hrs, e) >9hrs’. The author adopted a range of categorical variables, and these are discussed later in the chapter. Finally, open ended questions capture any word-based data, for example ‘How would you like to improve the school?’. Table 17 illustrates the differences between the scales of data.

<table>
<thead>
<tr>
<th>Example types question types</th>
<th>Level of data</th>
<th>Equality</th>
<th>Order</th>
<th>Average</th>
<th>Differences between variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of question</td>
<td>Scale of data</td>
<td>can be evaluated?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>-------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dichotomous questions</td>
<td>Nominal</td>
<td>✓</td>
<td>Mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple choice questions</td>
<td>Nominal</td>
<td>✓</td>
<td>Mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rank ordering</td>
<td>Ordinal</td>
<td>✓ ✓</td>
<td>Mode, Median,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rating scales</td>
<td>Ordinal</td>
<td>✓ ✓</td>
<td>Mode, Median,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant Sum</td>
<td>Ordinal</td>
<td>✓ ✓</td>
<td>Mode, Median,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratio data questions</td>
<td>Ratio</td>
<td>✓ ✓</td>
<td>Mode, Median, Mean, Arithmetic Mean, Geometric ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordered variable questions</td>
<td>Interval</td>
<td>✓ ✓</td>
<td>Mode, Median, Mean, Arithmetic Mean ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word-based data</td>
<td>Open-ended questions</td>
<td>✓</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Table 17. Differences between the scales of data.

Internet surveys are now becoming commonplace within education literature after years of applications in student evaluations (Morrison 2013; Denscombe 2014; Dillman et al. 2014). There is evidence to suggest that internet surveys are now the preferred mode of conducting surveys and questionnaires, superseding traditional paper-based surveys (see Roberts and Allen 2015). They are completed on websites or within emails, accessible from computers, tablets, and mobile devices. Although they share similarities with paper-based surveys, internet surveys have their own unique characteristics and features, in which designing one can differ significantly.
3.2.2.1 Online surveys

There are many online survey templates which have a plethora of functionalities that are available for researchers to collect data. Some of the most popular providers are SmartSurvey, SurveyMonkey, Google Forms, and Online Surveys (formerly Bristol Online Survey); some of which have a free version with some limitations on question type and quantity, whereas most are subscription based. The School of Social Sciences, Humanities and Law at Teesside University have a subscription to Online Surveys, so this was explored initially. Online Surveys allows for data to be automatically presented and downloaded into formats such as Microsoft Excel, Statistical Product and Service Solutions (SPSS), Statistical Analysis System (SAS) or Stata (see Morrison 2013). Type Form are market leaders in survey creation, and they claim that they are able to create ‘beautiful and engaging surveys’. Although researchers have the choice to choose from numerous available fonts, colours, graphics and animations, some scholars (Dillman et al. 2014; Morrison 2013), have raised concerns around both technical and presentational matters. For example, technologically, online surveys with a high volume of graphics often take much longer to download than those with few graphics. Consequently, respondents with slow Wi-Fi or internet browsers will spend more time downloading graphics, leading to the machine to crash or the respondent to give up. Therefore, it is recommended that online surveys are plain to avoid downloading issues and for higher response rates, accordingly, Online Surveys was chosen as a preferred provider. Furthermore, I discovered that complex and sophisticated page layouts attract a 43% completion rate, compared with a much higher 71% for simple layouts (Fricker and Schonlau 2002). In a presentational sense, moving from a paper-based survey where the eyes and hands focus on the same area, to an online survey where the focus for the eyes and hands differ (screen and keyboard) renders completion additionally difficult (Dillman et al. 1998; 1999). Thus, open ended questions are often avoided in online surveys.
The advantages and disadvantages of internet surveys are outlined in Cohen, Manion and Morrison (2018) and illustrated below in Table 18.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (e.g., paper and printing)</td>
<td>Spam (e.g., education servers regarding email as spam)</td>
</tr>
<tr>
<td>Speed (e.g., distribution)</td>
<td>Expertise (e.g., requires sufficient internet knowledge)</td>
</tr>
<tr>
<td>Population and samples (e.g., greater</td>
<td>Sampling (e.g., target groups not having internet access)</td>
</tr>
<tr>
<td>audience)</td>
<td>Abandonment and dropout (e.g., easy to not respond)</td>
</tr>
<tr>
<td>Contact (e.g., location and no physical</td>
<td>Computer difficulties (e.g., software issues may impact survey layout)</td>
</tr>
<tr>
<td>constraints)</td>
<td>No interviewer (e.g., no opportunities for in-depth probes)</td>
</tr>
<tr>
<td>Volume (e.g., larger data sets)</td>
<td>Security and privacy (e.g., hacking and data vulnerability)</td>
</tr>
<tr>
<td>Access (e.g., anonymous participants)</td>
<td>Design matters (e.g., technical expertise is needed)</td>
</tr>
<tr>
<td>Convenience (e.g., can complete in multiple sittings)</td>
<td>Time (e.g., may require manual data entry)</td>
</tr>
<tr>
<td>Responses (e.g., higher response rate)</td>
<td>Response rates (e.g., may drop if survey is too long)</td>
</tr>
<tr>
<td>Ease (e.g., easy to enter responses)</td>
<td>Misreporting (e.g., fake reporting for a reward)</td>
</tr>
<tr>
<td>Environment (e.g., environmentally friendly)</td>
<td>Test (e.g., may require manual data entry)</td>
</tr>
<tr>
<td>Design flexibility (e.g., navigating the survey)</td>
<td>Response rates (e.g., may drop if survey is too long)</td>
</tr>
<tr>
<td>Attractiveness (e.g., graphics and animations)</td>
<td>Satisficing (e.g., respondents may enter any response if survey is too long)</td>
</tr>
<tr>
<td>Response checking (e.g., prompting respondents)</td>
<td>Satisficing (e.g., respondents may enter any response if survey is too long)</td>
</tr>
</tbody>
</table>

*Table 18. Advantages and disadvantages of internet surveys.*

At first glance, it appears that for every benefit a researcher will gain from using an internet survey, there is an additional factor they must consider. However, much of the disadvantages highlighted in Cohen, Manion and Morrison (2018) could reasonably fall under general survey and questionnaire disadvantages. Table 18, for example describes ‘no interviewer’ as a disadvantage to online surveys, however, this is likewise relevant in all surveys including paper-based ones, as is ‘satisficing’ and ‘misreporting’, with no evidence to suggest that this is higher in internet surveys. In fact, the social science literature reveals that due to a more defined population and sample, misreporting could be much lower than the paper based equivalent. In
other words, it was viewed that there were significant advantages to conducting the surveys electronically whilst some of the disadvantages would also be present in paper-based surveys.

3.2.3 Observations

An alternative data collection method that was initially considered, however ultimately not chosen is through observations. Observations provide the researcher with an opportunity to watch subjects in their natural setting, gathering data about behaviours and routines. One of the most widely advocated benefits of observations is that the researcher can access live data, as opposed to second-hand data from journals or online (Creswell 2012). Marshall and Rossman (2016) argue that observations can be both systematic (structured and following procedures), or unsystematic (unstructured and casual). Observation enables the researcher to gather data on the physical setting, the human setting, the interactional setting, and the programme setting, and this can be useful in a variety of forms and contexts. Despite some obvious benefits, observations can be expensive, and take a large amount of time to gather the required data, and this largely contributed to the author exploring surveys. Traditionally, observations have been thought of as non-interventionist (see Adler and Adler 1994 in Cohen, Manion and Morrison 2018), however there are hypotheses that suggest the researcher could have further roles in observational research, such as observer-as-participant, and participant-as-observer. These roles support the researcher establishing causality, yet, when interference is high, there is a greater reliance on interpretation by the researcher, such as making judgements on motivation. Therefore, perhaps the safest form of observation is with low interference, hence, the author decided against using observations alongside surveys. Although observations were not used in this research, having an understanding of other available data collection methods was important. Regardless, observation is seen as a powerful tool for gaining insights into situations that also addresses issues on reliability and validity (Cohen, Manion and Morrison 2018).
3.2.4 Mixed Methods

Mixed methods research (MMR) is often referred to as the ‘third methodological movement’ and has been chosen in this study due to the significance highlighted earlier in moving ‘beyond the paradigm wars’ (see Polio 2012, p. 294; Johnson et al. 2007). Creswell and Clark (2011, p. 11) offers a definition of MMR that is ‘research undertaken by one or more researchers which combines various elements of both quantitative and qualitative approaches regardless to perspectives, and thus, MMR can be branded a ‘transformative paradigm’. MMR recognises that there is a need to move away from one’s sole allegiances to quantitative or qualitative research, involving data collection (both quantitative and qualitative). I argue that MMR enables an increasingly comprehensive understanding of a phenomenon by obtaining multiple insights into the explanations and processes associated with that phenomenon. In other words, MMR can complete a picture that would otherwise be left unfinished by a single approach. With thought to reliability and validity, MMR can increase the credibility of data through triangulation, and reduce bias in the research (Denscombe 2014). More specifically, MMR can provide additional accounts of the complexities of research phenomenon (see Day and Sammons 2008; Greene 2005).

Although there is an attraction to using MMR is most research projects, it must be administered in either complementary ways, to make up for the shortcomings of a particular method, or in supplementary ways, in other words, to explore what is being added to the research. Bergman (2011) argues that using MMR in simply supplementary ways is not a sufficient justification for its application in research methods. It is advised by Bergman (2011), that before employing MMR, a researcher must ask the following questions: what is gained/lost by looking/not looking at the world in mixed ways? What does researching objectively and subjectively, scientifically and interpretively, quantitatively and qualitatively, by numbers and by qualitative approaches tell us? What is it about this research that requires MMR, such that
not to use MMR is to diminish the quality and validity of the research? (Cohen, Manion and Morrison 2018). In this instance, MMR allows for themes derived from the surveys to be fleshed out and further explored in qualitative open-ended interviews. Without the use of MMR, the study would not be able to support its claims of triangulation.

3.2.5 Qualitative data analysis

Qualitative data analysis is concerned with how data is used in understanding, explaining, and interpreting representations of phenomena. Many qualitative approaches to analysis are diverse and complex, meaning there is no single formula for this. Although qualitative analysis is necessarily based on interpretation, there are two main types, discourse analysis which is analysis of written or vocal language, or coding analysis which labels pieces of data. Thematic analysis (Braun and Clarke 2006; 2013) is a systematic method of organising rich data to facilitate the discovery of new themes, and this sits within coding analysis; simply put, it is moving the codes to key themes. There are six main phases to thematic analysis as described in Braun and Clarke (2006) as illustrated below in Table 19.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Familiarisation</td>
<td>Familiarising with the data from start to finish, including anything necessary with transcription. This phase is all about getting to know your data.</td>
</tr>
<tr>
<td>2) Generating initial codes</td>
<td>Assigning codes to your data as a way of organising your data into meaningful groups. For example, codes may be: ‘Twitter, Facebook and YouTube’.</td>
</tr>
<tr>
<td>3) Searching for themes</td>
<td>Whilst codes will identify interesting information in your data, themes will involve interpreting the data. For example, the above codes may be in a single theme called ‘Social Media’.</td>
</tr>
<tr>
<td>4) Reviewing the themes</td>
<td>Refining the themes relating to phase 3 and exploring any theme overlaps. Themes should cohere together meaningfully, while there should be clear and identifiable distinctions between themes.</td>
</tr>
<tr>
<td>5) Defining the themes</td>
<td>Describing the themes that have been identified in the previous phases. For</td>
</tr>
</tbody>
</table>
Table 19 Braun and Clarke’s (2006) six phases of thematic analysis.

Thematic analysis can be used across a range of epistemologies and research questions, making it ideal for identifying, analysing, organising, and describing themes found in a data set. Furthermore, thematic analysis is primarily linked to a constructivist approach due to the nature of building themes through a process that considers inter-subjectivity, i.e., our social ways of seeing and = of being in the world (Willig 2008).

Despite this, thematic analysis is not always appreciated in the same way as grounded theory or ethnography, even though it remains widely used in qualitative research (Braun and Clarke 2006). Thematic analysis can produce trustworthy and insightful findings, nonetheless, researchers are not in agreement about its rigour as a form of analysis. The lack of substantial literature, in combination with the flexibility of thematic analysis, can cause novice researchers a level of uncertainty and inconsistency when developing the themes. Nevertheless, the theoretical freedom that thematic analysis brings to this research provided a rich and detailed account of the data that can be easily grasped, and this is in keeping with the ideas of its uses for early career researchers, as noted by Braun and Clarke (2006), King (2004), and Nowell et al. (2017). Furthermore, thematic analysis is useful in summarizing key features of large data sets as it forces the researcher to take a structured approach that helps highlights similarities and differences to generate a clear final report (King 2004).

3.2.6 Quantitative data analysis

Descriptive statistics are primarily used for summarising data in ways that are meaningful and useful to the researcher. They can include: standard deviation, central tendencies, frequencies, percentages and correlation coefficients. In descriptive statistics there is substantial focus on how data is presented in visual form, hence, the many forms of graphical
presentation that are used. For example, many data software packages now include: frequency and percentage tables, bar charts, histograms, line graphs, pie charts, high and low charts, scatterplots, stem and leaf displays, and boxplots. Importantly, when working with the general population, there ought to be a consideration to the fitness of the audience as some readers may consider charts more comprehensible and accessible than tables. There are some general guidelines with regards to presenting and these are as follows: bar charts for presenting categorical and discrete data, 3D bar charts and histograms are often unnecessary unless they add value, histograms for presenting continuous data, line graphs for presenting trends, pie charts are useful for showing proportions, scatterplots are useful for showing relationships, and boxplots are useful for the distribution of variables (Cohen, Manion and Morrison 2018).

Central tendencies measure the mode, mean and median of a set of data, and they too have their own general guidelines: mode is particularly useful in categorical data, mean for nominal data, and median for ordinal data. If scores are widely dispersed around the mean, then Standard Deviation (SD) can be used to calculate the average distance a score is from the mean. SD is calculated as:

\[
SD = \sqrt{\frac{\sum d^2}{N - 1}}
\]

Where \( d \) = the deviation of the score from the mean, squared
\( \Sigma \) = the sum of
N = the number of cases

SPSS is a popular software package that can calculate SD, saving the researcher time and improving validity to the study, and thus, has been used in the present study.

3.2.7 Sampling

The quality of a piece of research is often measured on the appropriateness of its methodology and this includes the adopted sampling strategy. Samples are taken from a target
population and they define the research focus. Cohen, Manion and Morrison (2018) argue that a sample must be able to obtain data from a target population in such a way that the knowledge gained is representative of the total population. There are two ways in which this can be achieved, the first is to start with the total population and work down to reach the sample; this is commonly used with experienced researchers. In contrast, less experienced researchers determine the minimum number of respondents needed to conduct the research and work bottom up; unless the total population is defined in advance, it is difficult to justify this as a true representation. (Bailey 1994). Thus, in the present study I began with the total population and worked down.

There are benefits to working in this way, for example, it is less costly in time and resources, rich and more in-depth data can be collected, and the quality of data can be representative of the population.

Furthermore, there are multiple methods that are applied in sampling; and primarily these methods fall within two overarching sections, probability sampling, and purposeful sampling (Cohen and Holliday 1979, 1982, 1996). Firstly, in probability sampling the chances of the population being selected are known, whereas, in purposeful sampling they are not. In other words, everyone has an equal chance in probability sampling as there are no inclusion or exclusion criteria, and in contrast, purposeful sampling excludes some of the population. The present study applies purposeful sampling to the study with participants needing to be an active teacher with QTS.

Probability sampling seeks representative-ness and thus makes generalisations in the research; there are several types of probability samples such as: simple random sampling, systematic sampling, random stratified sampling, and cluster sampling. Firstly, simple sampling can be described as every member of the population having an equal chance in participation. It involves selecting a random list, or drawing names from a hat (Cohen, Manion
and Morrison 2018), however, to address generalisation matters the sample must contain characteristics similar to the population as a whole; some old and young, some tall and short, some fit and unfit, some rich and poor etc. In contrast, systematic sampling involves further structure to the process and contains certain parameters. As an example, if a researcher was working in a school with a population of 1,000 and a sample of 50 was required, a starting point could be to select every twentieth person (Barrerio and Albandoz 2001). This method of sampling is often critiqued for issues relating to periodicity (Calder 1979) as with the above example if the list of students were ordered by ability or gender it may fail to represent the whole school population. Some research projects require dividing the population into homogenous groups based on characteristics such gender or native language with these groups called a ‘strata’. This type of sampling is referred to as random stratified sampling and enables quantitative and qualitative research to be undertaken. An example would be to divide the sample into groups of age, such as 18-29, 30-39, 40-49 etc., then proportionally select numbers of people from each age group.

When the population is large and widely dispersed it can become difficult to govern simple random sampling, yet cluster sampling could pose an administrative solution. Cluster sampling involves random sampling from a select school of a geographical cluster.

Purposeful sampling deliberately avoids representing the wider population as it seeks to only represent a particular group, as in the qualitative element of the present study, a group of teachers. Within purposeful sampling sits quota sampling, dimensional sampling, theoretical sampling, and purposive sampling. Firstly, quota sampling is a process where the researcher represents characteristics from the wider population. It has been referred to as the non-probability equivalent of stratified sampling, with the recognisable exception that subjects are only accepted if they meet the characteristics criteria. For example, if the wider population contains 55% female, and 45% male, then the sample would have to contain the same. Quota
sampling gives proportional weighting to factors that reflect the wider population, meaning it can save significant costs. Despite this, researchers have argued that when the numbers of strata are increased, the sample can quickly become increasingly complex and thus, it is recommended to keep the number of strata to a minimum. This piece of research did not adopt quota sampling to the recruitment cycle due to this complexity.

One method of reducing the sample size problem in quota sampling is dimensional sampling (as in Robson 2002). Dimensional sampling strives to integrate multiple characteristics that have been identified in the research, for example, in an education technology study, the research may think it is appropriate to distinguish generation Z, millennials, and generation X.

Theoretical sampling is a feature of grounded theory and involves purposively identifying participants as concepts and themes emerge (Glazer and Strauss 1967; Strauss and Corbin 1998). Having conducted the analysis of the data, the researcher would then decide what further data is required and from whom. A disadvantage of this method is that the researcher does not know the range of data that is required in advance, meaning it is impossible to identify the sample size (Glazer and Strauss 1967).

In purposive sampling, the researcher selects a sample that serves a specific need or purpose (Cohen, Manion and Morrison 2018; Robson 2002; Gliner, Morgan and Leech 2009). Samples are handpicked based on the researcher’s judgement or possession of a particular characteristic. In the present study, for example, the sample contains teachers because the study aims to explore social media and pedagogy. Furthermore, teachers have been selected because they have an in-depth knowledge of pedagogy in a professional role, and this was assessed through their QTS. In contrast, there would be little benefit in seeking a random sample when most of the population would not have the expertise, experience, or networks (Ball 1990). Although, the researcher is unable to generalise the analysis, this is not the primary concern of purposive
sampling; the key aim is to obtain in-depth information from those who are in a position to provide it.

3.3 My Methods

The following section will refer to the methods that have been adopted in this thesis. In particular I detail the methods I used in respect of the recruitment of participants, the process taken for designing the survey, and the steps that were involved in the interviews. Interestingly, COVID-19 and the restrictions on meeting individuals face to face meant the initial plan for conducting interviews had to be modified to comply with the new guidelines. I will expand on the adaptations made to the research methods in this section, and furthermore, this section will describe the method of data analysis used for the qualitative and quantitative elements of the study.

3.3.1 Researcher positionality

I identified that my positionality, which included being a non-teacher from a quantitative background, contributes to my worldview and this has influenced the research process. This worldview concerns both the ontological and epistemological assumptions of the study. As a non-teacher, I was aware that I might have misconceptions about teaching in the secondary classroom; thus, I had to become increasingly reflexive in my research to ensure I was sensitive to the social context (Bryman 2016; 2021). Reflexivity is an essential process for informing, developing and shaping research positionality.

My positionality influenced particular encounters with the participants, whereby I required clarification on specific terminology used in schools as described by the teachers. Similarly, there were instances that needed clarification by myself when discussing the technical aspects of teaching and learning with social media. I adapted my skills of social interaction as the interviews progressed, and I considered how I was influencing the research process at all points
of the research. This is important during qualitative research due to the requirement for researchers to acknowledge and consider their views, values, and beliefs (Holmes 2020).

Furthermore, through a reflexive approach, I understood how my positionality might reduce credibility and increase bias in the research. Whilst it remains difficult to approach this work through pure objectivity, by exploring my positionality, I was better able to identify areas of potential bias. I argue that being an ‘insider’ (Merton 1972), in other words, an active teacher conducting this research, may evidence inherent bias, and this did not apply to me being as an ‘outsider’ researcher. Furthermore, as I did not have any prior experience in the secondary classroom, I was never too close to the subjects or culture to let this influence the research process in negative ways (Holmes 2020). My appropriate professional distance from the teachers in the research sample also enabled me to explore shortfalls in educational policy in impartial ways. Moreover, because I made the participants aware that I was not a teacher, they were able to articulate and explain procedures in schools without assuming that I knew the obvious day-to-day workings of a teacher.

3.3.2 Participants

In total, 434 participants (n = 411) completed the online survey, 20 participants (n = 20) took part in the first interviews, and a further 3 participants (n = 3) were involved in the final set of interviews. The eligibility for participation was as follows: an active teacher working in a secondary school. The process of moving the sample from phase 1 to phase 2, and then to phase 3 is detailed in the procedure section below.

Initially, the participants were recruited by making contact with the educational institute and requesting if an introductory email along with the survey link could be circulated to their teaching staff; further recruitment also took place on Twitter. Making contact with schools proved useful and the majority of surveys were completed in this way. Nevertheless, I found Twitter advantageous in reaching audiences from the education sector based throughout the
U.K. Recruitment of participants took 10 months in total. The nationwide reach of the survey illustrates the power of social media, in particular Twitter, in reaching fellow practitioners and professionals.

3.3.3 Instruments

The present study adopted a mixed methods methodology that consisted of a three-phase data collection approach. The first phase included an online survey with 11 closed questions and 3 five-point Likert rating scales (please see appendix 1). Many of the questions were made up of categorical variables, whereby the variable has categories as values. Some examples within the survey include ‘Yes’ and ‘No’, and ‘Facebook’, ‘Instagram’, ‘Pinterest’, ‘Snapchat’, ‘Twitter’, ‘WhatsApp’, ‘YouTube’, and ‘other’. In this phase, participants were recruited using a purposeful sample who met the eligibility criteria of being an active secondary teacher with QTS (please see appendix 2).

The second phase included participants that were chosen from the survey, therefore, they had already met the eligibility criteria from phase 1. Phase two began once key themes had been derived from the quantitative survey findings and converted into questions where they could be explored in greater depth in a qualitative way. This methodology is supported in Hesse-Biber (2010, p. 66) ‘Qualitative research can draw on quantitative findings to explore in more detail issues and discrepancies’, and in Nochumson (2020). Additionally, multiple methods were used to capture responses to ensure credibility for triangulation purposes. Mertens and Hesse Biber (2012) argue that triangulation can be used in a way in which the data collected corresponds with other data to add credibility to the research findings. Cronbach’s alpha testing was conducted to reveal how reliable the instruments, and in particular the survey findings actually are. This test was carried out on questions 3, 10, 11, 12, 13, 14, 15 and 16 due to the nature of the answer types and how they can be added to a scale for analysis. For example, in this test strongly agree = 1, agree = 2, neither agree or disagree = 3, disagree = 4, strongly
disagree = 5. The third phase contained loose semi-structured interviews where key themes were presented to participants for their feedback.

3.3.4 Procedure

Phase 1: Surveys

A small pilot was conducted whereby scholars within the School of Social Sciences, Humanities and Law at Teesside University completed the survey to ensure that the survey software was working, to evaluate the questions, and identify potential problems. The pilot’s primary goal was to assist in preparation for the launch of the wider and more comprehensive survey. Feedback from the pilot influenced some minor wording changes to the questions, and some stylistic changes to the layout that enhanced the flow of the survey. Thus, the soft launch was successful in establishing feasibility of the survey.

Data captured through online surveys can be automatically downloaded and presented into formats such as Excel, SPSS, and SAS. This enhanced data accuracy supports the reliability and validity of the study. Online Surveys were selected due to the range of question types, customizable and professional themes, respondent screening, import and export functions, customized link, and data analysis features. Planning the survey followed a chronological sequence where objectives were defined that link to the main research questions in this study. Supervisory meetings supported the focus of content, such as the wording of the questions that would help achieve the survey’s objectives. An online survey was then generated and designed using features within Online Surveys. The author spent considerable time designing and formatting the survey as it was acknowledged that the literature emphasises the importance due to the variety of devices that would be used to access the survey, such as, mobile, tablet and PC, technical issues such as graphic load time, and internet congestion. Layout was also thought through as the aim was to produce an academic survey that was accessible to the research participants and one that produced a high completion rate.
Once the survey was drafted, the pilot was administered that included the research supervisors, and this was useful in refining the survey questions, sequencing, and answer types. Cohen, Manion and Morrison (2018) argue that a pilot survey is a fundamental stage when planning a survey as it can capture poor question design and wording, instrument appearance, as well as logistical issues, especially in online surveys. Conducting pilot surveys can often become time-consuming, frustrating, and fraught with unanticipated problems (as with Mason and Zuercher 1995), however by having access to a supervisory team with a wealth of experience in survey design, this ensured that superior practice was carried out, thus saving a great deal of time. Once the survey had been refined and modifications made following the pilot feedback, I began recruiting participants. Emails were sent to schools within the Yorkshire and Humber region, and then within the North-East with some introduction text and a link to the survey to share around schools. The email stated what the survey results would be used for and included links to the participant information form and consent form. Additionally, further text on the email read ‘I hope you enjoy the video at the end of this survey’ which referred to an education technology video was attached at the end of the survey. It was hoped that this would increase the completion rate with much of the literature arguing that a low response rate is an issue with online surveys (Roberts and Allen 2015).

Covid-19 and the subsequent U.K lockdown meant that the educators were now working remotely and using platforms that were relatively uncommon in the workplace, for example, Google Classroom, Microsoft Teams, Zoom among others. The author identified that the conversation had changed, and public debates were now taking place on the advantages and disadvantages of some of these platforms; in relation to the present study social networking sites were also included. This change presented an opportunity to send further emails that referred to the importance of online teaching and the pandemic. It was envisioned that the
change would further promote additional responses. Responses increased during the revised email.

Phase 2: Interviews set 1

Interviews conducted in the present research utilised Cohen, Manion and Morrison’s (2018) ten-stage sequence for planning interviews, these are: thematizing, designing, construction of schedules, question formats, response modes, conducting the interview, transcribing, analysing, verifying, and reporting.

A sub-sample of 20 survey respondents participated in 15-20minute semi-structured interviews that took place either on Zoom, Microsoft Teams, Skype, or in person. Initially, interviewees were recruited through the school or educational institute, and thereafter on Twitter. Interview questions were informed by themes that arose from the descriptive statistics analysis of the survey questions. Semi-structured interviews are presented in a way that allows the researcher to have a list of themes and questions to be covered in the interview, with the added benefit of being flexible to allow further questions to be asked. Semi-structured interviews allowed the author to ask and explore information with the interviewee that they expressed that was important to them. In particular, any personal, professional, or social experiences the interviewee had with social media in pedagogy was explored during the interviews. This research approach was also facilitated in Nochumson (2020), Cohen et al. (2011), and Hennink et al. (2011), and thus, supported a justification for selection.

Whilst the survey remained open, I began developing the research interview questions and this process was informed by the themes that were emerging from the survey data. The process of confirming the wording of questions arose from feedback from the supervisory team; similar to the survey procedure. Then schools and key contacts within the Barnsley, Sheffield and Hallamshire region were contacted informing them of an opportunity to take part in this study. Whilst communicating with the stakeholders, I made known the intent of face-to-face
interviews when schools re-open and the easing of the COVID-19 lockdown commences. Despite this intention, it became evident that face to face, and COVID-19 would not simply ‘go away’, therefore, adaptations to the construction of interview schedules had to be made. I then re-contacted the schools that had agreed to take part and informed them that the interviews would now be taking places on Microsoft Teams or their preferred platform; some educational institutions had a preference for Zoom. During this period, the U.K. government announced the introduction of ‘socials bubbles’ whereby adults could expand the number of people they were interacting with by creating a small network of friends or family who agree to abide by a shared set of rules to keep everyone safe from COVID-19. The bubbles, often referred to as ‘social pods’ or ‘quaranteams’ by the media (see Hackensmith Health 2020) were limited to 10 people; later reduced to 6. Within my own bubble was an educator who qualified to take part in the study. In this instance, a face-to-face interview took place. Schedules that were agreed included a location (online), date, time, and an opportunity to ask questions before the interview via email (Mills 2001). Due to the interviews moving online, I decided to record the interactions and create notes afterwards with the recording used as a reference. This allowed me to listen and reply with thoughtful responses to the participant’s answers. Furthermore, literature in this domain advises that note writing may prevent respondents from giving information for sensitive and confidential issues because they do not want to be recorded. Another disadvantage is that it can present a disruption to the flow of the interview, whereby there is a delay in the interviewer responding to the participants responses. Furthermore, Raimond (1993) and Saunders and Klemming (2003) argue that note take during interviews can help set parameters against which to evaluate possible ideas, however, this could also be a limitation as it can be hard to know what is considered ‘important and essential’ at the time of interviewing. Additionally, Denzin and Lincoln (2002) give examples of how best to take notes and include recopying or retyping the notes as a possible ‘waste of time’ and an activity which
increases the likelihood of error and confusion. This was particularly pertinent as an early-stage researcher and I reflected on these academic reflections on note taking.

One of the advantages to recording the interview was that there is not a loss of data and the researcher can refer back to tapes and recordings which includes large amounts of data at any time (Muswazi and Nhamo 2013). Moreover, Denzin et al. (2005) suggest that this method allows the researcher to complete an intellectual task which supports the analysis process with minimum effort. One of the benefits to transcribing is that it is a crucial step in interviews and without it, there could be a massive loss in data (Cohen, Manion and Morrison 2018); with the potential loss of data already addressed, transcribing the full interviews proved to not enhance the validity of the study and therefore was not undertaken. This is further discussed in the data analysis section.

Data was analysed using thematic analysis (Braun and Clarke 2006) due to its flexibility in being linked to a particular theoretical framework whilst providing a rich, detailed, and complex description of the data (please see appendix 3 for mind map). I have experience of undertaking this type of analysis, by working alongside my director of studies to generate the initial codes, search for themes, and review the themes, and this has enhanced the rigour of this study. The results of this interviews are presented in chapter 4.

Phase 3: Follow up interviews

Similar to the process carried out in the previous stage, the ten-stage sequence (Cohen, Manion and Morrison 2018) was administered as a framework throughout this phase. Participants were invited back to further explore some of the key themes that developed in phase 2. Participants were selected purposively because they had provided particularly enthusiastic and interesting initial interviews. The participants are what Bryman (2015) notes as ‘key participants’ in qualitative research because of their potential to provide ‘rich’ and ‘detailed’ insights. In inviting selected participants to return for phase 3 of the research, I
applied Bryman’s (2015) notion of ‘key participants’ to the research process and this enabled the development of rich and detailed insights that built upon key themes that had been identified in phase 2 of the research. Although, semi-structured questions were used, this phase was increasingly informal and allowed the participants to discuss wider issues in education that linked to the key themes. A noticeable example was CPD and this will be evidenced in chapter 4. Interviews were conducted online using Microsoft Teams and lasted between 40 minutes and 1 hour within a 5-month period. The significant difference in procedure compared with phase 2 was that the interviews were conducted in the midst/peak of a major U.K. lockdown. Subsequently, the participants were more experienced at working with online technologies and they were able to give examples of CPD, and technological platforms used in recent times. Interviews were recorded which helped during the subsequent transcribing for the purpose of thematic analysis (Braun and Clarke 2006). An illustration of the data collection process is shown below in figure 4.
3.3.5 Data Analysis

Quantitative analysis is a particularly powerful research tool when associated with large scale research. Descriptive statistics describe and present data in terms of summary frequencies (Cohen, Manion and Morrison 2018). This type of statistics report on what has been found without interference. In this study, I have presented the data using descriptive statistics as a form of analysis. The main aim of organising the data this way is so the findings can be easily understood by providing simple graphics in graphs, charts, and tables. The data is also presented in a way whereby frequencies and percentages of responses are shown. The tables and charts have been created using Microsoft Excel and Word as they had various ways to make the data displays visually appealing with simplicity. This is in contrast to the tables and charts created in SPSS which are less accessible and less comprehensible for the readers of this thesis in general.

Firstly, data from the whole survey was exported from Online Surveys in an Excel file. This was then broken down into individual questions and answers, and this is when graphs were created. Bar charts are particularly useful for presenting categorical and discrete data and thus appropriate for this data. These figures were then imported into the thesis. I used a sum total for each column/question, and this supported creating frequency and percentages tables in Word.

The study applied Cronbach’s alpha test to identify how reliable some of the survey questions were with regards to internal consistency of the survey. The test was performed on SPSS, and the benefits of this was that it made a complex calculation simpler, and I was also
able to identify any negative influences on the Cronbach’s alpha. Such as, if there were some questions in the survey that influenced the reliability of the study. This is presented in the form of ‘if deleted’ scale in SPSS. I followed Cohen, Manion and Morrison’s (2018) SPSS command sequence for Cronbach’s reliability calculation, and this is shown below in Table 20.

| In SPSS the command sequence for the Cronbach’s alpha is: ‘Analyse’ → ‘Scale’ → ‘Reliability Analysis’ → Send to the box marked ‘Items’ the variables which you wish to include → Click the box marked ‘Statistics’. This opens a new window. In the area marked ‘Descriptives for’, check the box marked ‘Scale if item deleted’ → Click ‘Continue’ → Click ‘OK’. |

Table 20. Cohen, Manion and Morrison’s (2018) SPSS command sequence for Cronbach’s reliability calculation.

Phase 2 and phase 3 of the data collection process involved qualitatively collecting data using semi structured interviews. Qualitative analysis concerns itself with understanding, explaining, and interpreting phenomena (Taylor and Gibbs 2010), and can include matters such as organising, describing, and explaining data. Whilst there is no simple formula for qualitative analysis, there are certain rules which a researcher must abide by; and many of these are discussed earlier in the chapter however one example is the acknowledgment that data must be interpreted as with notes or emerging themes, yet also being transparent and clear to demonstrate validity (Glaser and Laudel 2013).

A noticeable difference in the data analysis in this section of the study compared with phase 1 was that data analysis was an ongoing process that did not only occur at the end of the data collection period. This process supports a constructivist approach whereby themes are constructed throughout the analysis rather than simply appearing at the end. In this study, preparing the data for analysis was required. More specifically, in phase 2, interviews were recorded on Microsoft Teams and partial transcripts were typed up afterwards with the support of Team’s transcription functionality. This function worked well at the beginning, however as
the interviews progressed and the pace increased, sentences become broken up and this meant a manual process was followed. Hesse-Biber and Leavy (2006, p. 347) support the method of only transcribing partial interview data, arguing ‘transcription is not a passive act, however, instead provides the researcher with a valuable opportunity to actively engage with their research material… as part of the analysis’. Transcripts are also considerably time consuming with Cohen, Manion and Morrison (2018) reporting that a one-hour interview may take up to 6 hours to transcribe. The author made additional notes during interviews picking up on non-verbal cues, as well as being engaged by interacting with the data in an intimate way during transcribing. This further supports the method of partial transcription by summarising the important materials relating to the original source. The author was able to explore the data and reduce it to manageable yet impactful sizes.

The next step undertaken was to follow a systemic method of organising data to facilitate the discovery of new codes by using Braun and Clarke’s (2006) six phase model. Thematic analysis is a useful method as it can be used across a range of epistemologies and research questions, making it ideal for data collection phase 2 and 3. In Braun and Clarke’s (2006) model, the time spent interacting with the data during transcription was part of the familiarisation period, or phase 1. In phase 2, open coding analysis was a process then conducted on the data whereby light labels were given to pieces of text, such as paragraphs or key lines. Primarily, codes were not decided in advance, and this is supported in Glaser and Strauss (2013), Creswell (2012) and Braun and Clarke (2006). However, in some instances pieces of text did start to directly relate to emerging themes in the study, such as ‘professional practice’. This enabled the author to identify similar bits of information and then assemble and modify open codes to fit the data. Due to the large amount of data involved in the study, written maps supported the indexing and construction of codes.
In phase 3, broader themes were then identified using the codes derived from the mind-maps and this phase was underpinned by Trowler’s (2008) socio cultural theory and the six propositions; although this remained an inductive or ‘bottoms up’ approach. This enabled the author to interpret the codes for underlying messages. In phase 4, extracts were copied over to the assigned themes and reviewed to identify any overlapping themes and themes that are meaningful collectively. This phase also ensured that there wasn’t any potential coding or labelling that was missed. The author’s supervisory team also supported the process.

In phase 5, the author then refined the themes that were deemed essential and provided a justification why the themes were of particular interest. The themes were also organised in a coherent way to present a consistent narrative. As part of phase 6, the themes are presented in chapter 4 along with evidence in the form of extracts from the interviews, and this accounted for the narrative phase of the thematic analysis. The extracts in this thesis go beyond describing in a concise way, the individual themes, and instead reveal a story of detailed analysis.

3.4 Good Practice

This section of the chapter discusses reliability and validity in educational research and how both terms have been applied in the present study. The complexity of paradigms opens up the case that reliability and validity have different interpretations in qualitative, quantitative and MMR. Additionally, this section will explore triangulation as a technique to ensure data richness and the different types of triangulation with their characteristics. Finally, this section concludes with the author taking the reader on a journey of reflection, demonstrating how experiences in the personal, social, and professional have developed me as a social science researcher.

3.4.1 Validity in social science research

Firstly, Winter (2000, p. 1) defines validity as ‘a demonstration that a particular instrument or fact measures what it intends, purports or claims to measure, that an account accurately
represents those features that is intended to describe, explain or theorise’. Researchers must be able to evidence that instruments used for understanding a research phenomenon are connected in this way. This is particularly important in abstract research or theoretical constructs such as, intelligence, anxiety, motivation, and empathy as there are no uniformly agreed measures or units (see Shadish et al. 2002). Traditionally, researchers and scholars have accepted that a study that evidences strong validity develops a sense of trustworthiness in the research (Murphy and Yilder 2010).

There are four main types of validity, and these are: construct validity, statistical validity, internal validity and external validity. Construct validity is the degree to which the instrument measures the theoretical construct, for example, is the researcher measuring what they think they are? Statistical validity concerns itself with the appropriateness of the testing, for example, does the independent variable cause a change to the dependent variable or is it by chance? Internal validity is found in the relationships between the research design and outcomes, for example, was the research carried out correctly? In contrast, external validity is about the generalizability of the results, for example, are they applicable in other countries, settings etc. Importantly, both construct validity and external reliability are concerned with generalization, with construct validity relating to theoretical constructs and external validity relating to sampling. There are numerous kinds of validity which fall within these four categories, for example, criterion-related validity, cross-cultural validity, descriptive validity, ecological validity, and theoretical validity among others.

Validity as a concept is essentially a facet of quantitative methodologies, and validity features may include consistency, predictability, controllability, and randomization of samples. For example, in statistical validity, low statistical power or high p values may indicate a limited range of data used, too much variation in the outcome measures, or a false assumption of causality, and thus, threats to validity.
Guba and Lincoln (1985) and Ary et al. (2002) argue that the foci of validity may include the following items: credibility, transferability, dependability, and confirmability and therefore replacing some quantitative concepts of objectivity, internal and external validity. With these criteria, academic rigour can be achieved mounting the credibility and fittingness of the data (Lincoln and Guba 1985; Morse et al. 2002). It is interesting to note that validity is primarily concerned with quantitative methods and in this way traditional positivist concepts. This piece of research adopts post-positivism which is more comfortable with the ‘creditability’ of research with transparency and reflexivity. The reflexive approach in this research includes continuous reflection on myself with a critical examination of the power relations in the research context, and the methodological approach has acknowledged the researcher’s own knowledge of the subject area (in other words, interpreting data in a particular way). The researcher positionality was critical in understanding the social and political context of the study.

Traditionally power relations have been significant in education due to the child-parent dynamic, which has influenced policy in this area (Ball 1993). Although this study does not involve children, there remains a power relation between the researcher and participants (teachers). Further complexity is added since the researcher is not a teacher and views technology in education through the lens of a software professional. This positionality had implications on every part of the research process from the research design to how the data was collected (Rowe 2014). Qualitative research has always presented researchers with unique considerations of power relations as the research is based on developing authenticity between the researchers and the participants (Miller et al. 2009). The researcher and participants did not have conflicting roles, and this democratised power relations. The interviews across phases 2 and 3 were the process of a co-production of knowledge as this is a fundamental social constructivist tradition. The author was able to use the in-depth studies of others’ experiences
to understand the context of the participants’ experiences. Furthermore, the researcher’s professional experience working with academics and software developers helped in developing mutually respectful relationships during the research process.

However, I was conscious of the need to address my lack of knowledge around teachers’ roles and responsibilities outside of the classroom, such as before and after school clubs, moderation processes, and year/department meetings. I always asked for clarification if ever anything was mentioned that I did not understand. Likewise, there were instances when I needed to explain and clarify technological concepts for the research participants, and all this helped in developing an effective research process. Each interview provided a new opportunity to improve the explanation of the research focus, and ‘confusion’ reduced as the interviews progressed. To mitigate against these challenges, I built a rapport with each of the participants in discussions around Covid-19, and I developed an increasingly egalitarian relationship as opposed to a hierarchical power relationship. Building a rapport, establishing trust and ‘courting’ is a standard method to ensure participants feel comfortable enough to give you access to their personal and intimate experiences (Miller et al. 2009).

I acknowledge that the relationship between the participants and the researcher is as significant as the answers given (see Epstein et al. 2005). Nevertheless, there is no defined way for achieving an optimal relationship in practice as this can vary on personality, social background, and in this instance, professional background (see Berg and Smith 1985). Some elements of the power relations were increasingly difficult to mitigate, such as participants excluded from the data analysis, and these are limitations that the researcher accepts. However, the researcher emphasised the contribution of both parties, characterised by a commitment to tell the participants’ stories, removing the illusion that this was a teacher-teacher partnership. It is this positionality that enables the research to have implications into both teaching and software arenas. In conclusion, I identified how positionality can influence the subject under
investigation, the research participants, and the research context. It is very rare that studies in social or educational research can be value-free (Carr 2000). This is due to the requirement of both acknowledgement and allowances to be made by the researcher to locate their views, values and beliefs about the research design, conduct and output.

Quantitative research places great value in both internal and external validity, whereas the emphasis in qualitative research is more on internal credibility. In many cases external validity is irrelevant in qualitative research as it does not seek to generalise but merely to represent and interpret the phenomenon (see Creswell 2012). There is much literature comparing the validity in quantitative and qualitative research, and I found Cohen, Manion and Morrison (2018) helpful as revealed below in Table 21.

<table>
<thead>
<tr>
<th>Bases of validity in quantitative research</th>
<th>Bases of validity in qualitative research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controllability</td>
<td>Natural</td>
</tr>
<tr>
<td>Isolation, control, and manipulation of variables</td>
<td>Thick description and high detail on required or important aspects</td>
</tr>
<tr>
<td>Replicability</td>
<td>Uniqueness</td>
</tr>
<tr>
<td>Predictability</td>
<td>Emergence, unpredictability</td>
</tr>
<tr>
<td>Generalizability</td>
<td>Uniqueness</td>
</tr>
<tr>
<td>Context-freedom</td>
<td>Context-boundedness</td>
</tr>
<tr>
<td>Fragmentation and atomization of research</td>
<td>Holism</td>
</tr>
<tr>
<td>Randomization of samples</td>
<td>Purposive sample/no sampling</td>
</tr>
<tr>
<td>Neutrality</td>
<td>Value-ladeness of observations</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Confirmability</td>
</tr>
<tr>
<td>Observability</td>
<td>Observability and non-observable meanings and intentions</td>
</tr>
<tr>
<td>Inference</td>
<td>Description, inference, and explanation</td>
</tr>
<tr>
<td>Etic research</td>
<td>Emic research</td>
</tr>
<tr>
<td>Internal validity</td>
<td>Credibility</td>
</tr>
<tr>
<td>External validity</td>
<td>Transferability</td>
</tr>
<tr>
<td>Reliability</td>
<td>Dependability</td>
</tr>
<tr>
<td>Observations</td>
<td>Meanings</td>
</tr>
</tbody>
</table>


MMR must conform to its specific requirements of validity in both quantitative and qualitative research. Nevertheless, there is an argument for MMR having its own specific validity requirements, for example, Onwuegbuzie and Johnson (2002) propose the term ‘legitimation’ ought to be used to overcome integration issues. This describes the process
of conducting validity checks at each stage of data collection in MMR. Initially, I expressed concerns over the use of both qualitative and quantitative approaches, however the following was applied to overcome these: representation by having a largely word-based data to capture lived experiences, and ensuring results are transferable, plausible, and trustworthy. This was evidenced in the interviews that were conducted to gather deeper responses.

Furthermore, there were additional considerations made such as sample integration whereby the author used a sub-set of the sample in the qualitative section of the research as in the quantitative. Although the sample sizes were different, participants were primarily recruited for the interviews following their completion of the survey. This was also a benefit from a time standpoint as it made switching the data that was collected far easier. In terms of validity, one of the benefits of MMR is weakness minimization and combating the weaknesses of one approach with the strength of another and this was highly thought out in the planning stage. For example, it would be time consuming to conduct interviews with over 500 participants, hence a reason why a survey was chosen was its appropriateness. Yet, the interviews allowed for themes identified in the survey to be further explored, assisting in yielding robust meta-inferences. Onwuegbuzie and Johnson (2006) also argue that MMR validity involves paradigmatic mixing which is how successful the combination of ontological, epistemological and methodological beliefs are in yielding useful results; although, the present study does not use rhetoric and/or paradigms that are in tension with each other, rather MMR is viewed as a solution to this research phenomena.

Although, MMR is long standing, there remains few ideas and discussions around its validity (see Long 2015). This is perhaps due to post-positivism and social reality being multi-faceted, therefore, unclear how or why the research can aim for validity in a
traditional sense. Long (2015) argues that dialogue around MMR tends to be confined to research design, procedures, methods, and techniques, also known at the ‘logic of justification’. In order for a broader embrace of validity, the researcher must include issues that are fundamental in ontological and epistemological MMR.

3.4.2 Reliability in social science research

Reliability is often described as precision and accuracy within a research project and explores how consistent and replicable the results are over time. Measuring height, for example, would be thought of as being of strong reliability as it is it can be measured precisely, i.e., there is only one measure, whereas, musical ability cannot be measured as easily. If the present study was to be carried out with a similar group of participants and in the same context, similar results would be found. The following section is going to demonstrate why this is the case.

Firstly, both qualitative and quantitative research must be reliable or ‘rigorous’, however the features they adopt can vary. Guba and Lincoln (1994) argue that the concept of reliability is largely positivist meaning that terms such as ‘consistency’ in the context of testing is quantitative. Although, qualitative research must be as rigorous as positivist research and post-positivist research, the focus may focus on thoroughness and transparency of methods and reflection on the status and position of the researcher.

There are three types of reliability in quantitative research and these are: stability, equivalence and internal consistency. Reliability as stability is a measure of consistency over time (Miles and Huberman 1994), for example, an instrument which would yield similar data from similar respondents over time. The survey used in the present research follows an adapted version of stages in designing a questionnaire by Cohen, Manion and Morrison (2018) and Rattray (2007), therefore, if this model was run again under a replicated time span and with no changes having occurred, it should be expected that similar results would occur. Reliability as
equivalence is concerned with the degree to which two different forms of an instrument can obtain the same result, whereas, reliability as internal consistency relates to a test or method being conducted more than once. Although, the survey used was not retested, it went through a pilot study to ensure the data and findings were controllable, predictable, and replicable.

Scholars have attempted to distinguish the differences and suitability of the term reliability in qualitative research compared with quantitative studies (see Winter 2000; Stenbacka 2001). Lincoln and Guba (1985) argue that the term ‘reliability’ ought to be replaced with ‘confirmability’ or a notion of ‘dependability’. This is because quantitative research strives for replication and requires a ‘degree of control and manipulation of the phenomena (Cohen, Manion and Morrison 2018, p. 270), whereas qualitative premises include the uniqueness of situations in such a way that replication sits in an increasingly complex domain. However, qualitative research may strive for replication in comparing and validating theoretical constructs and might include repeating methods of data collection and analysis (LeCompte and Preissle 1993). Furthermore, Denzin and Lincoln (1994) propose that replicability can be addressed though the stability of observations, the use of parallel forms, and inter-rater reliability. The current study did address Denzin and Lincoln’s (1994) ideas to enhance reliability in qualitative research and this was because it is still a contentious point within the literature. Some scholars argue that two researchers may conclude alternative findings however both sets of data may be reliable.

3.4.2.1 Reliability tests

Internal consistency reliability is a commonly used psychometric measure in assessing survey instruments and scales (Litwin 1995). It is important to know how reliable the items in research instruments are for data collection, and there are different reliability tests that can be done to show this. Reliability tests attempt to determine the proportion of the test score that is due to error (Korb 2018). Without strong reliability in an instrument, the score within the
instrument cannot become valid. Some of the most commonly used reliability tests include Cronbach’s alpha, K-Test, T-Test, ANOVA, and Spearman- Brown’s split half test. Cronbach’s alpha is mainly used in education and psychology research, and it is a measure of internal consistency and looks at how closely a set of items are related in a group. The alpha will indicate to the reader if there is consistency in the participants responses. The range of the coefficient of Cronbach’s alpha is between 0-1 (Konting et al, 2009), and the scale is presented below in Table 22.

<table>
<thead>
<tr>
<th>Cronbach’s alpha</th>
<th>Reliability level</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.91-1.00</td>
<td>Excellent</td>
</tr>
<tr>
<td>0.81-0.90</td>
<td>Good</td>
</tr>
<tr>
<td>0.71-0.80</td>
<td>Acceptable</td>
</tr>
<tr>
<td>0.61-0.70</td>
<td>Questionable</td>
</tr>
<tr>
<td>0.51-0.60</td>
<td>Poor</td>
</tr>
<tr>
<td>&lt; 0.5</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

*Table 22. Konting et al’s (2009) Cronbach’s alpha scale.*

The reliability levels between researchers do differ slightly, for example, Bryman and Cramer (1992) suggest that any reliability level below 0.8 is not acceptable. Konting et al. (2009), George and Mallery (2003) and Cohen, Manion and Morrison (2018) suggest that the reliability level can be as low as 0.61 to be considered acceptable. This confusion has meant that some researchers have incorrectly disregarded this test as untrustworthily labelled, although, it has been suggested that those new to educational research must skill up on their knowledge about internal consistency and uni-dimensionality (Konting et al. 2009). For example, although Cronbach’s alpha will provide a score of consistency within the items, factor analysis is usually conducted to determine the dimensionality of a scale. This is popular in personality trait scales; therefore, this method is not applicable and is beyond this thesis. This psychometric statistic can measure both dichotomous and continuously score variables and this has made it popular in the literature. In other words, it is not applied to single items but groups of items that are thought to measure the same concept.
The survey consists of Likert Scales and other answers where there are more than one answer, therefore, it was deemed appropriate to administer Cronbach’s Alpha test. Additionally, this reliability test works under the assumption that there are multiple items measuring the same construct. Cronbach’s alpha can be written as the following formula:

$$\alpha = \frac{N\overline{c}}{\overline{v} + (N - 1)\overline{c}}$$

Where N is equal to the number of items, $c^-\overline{c}$ is the average inter-item covariance between the items and $\overline{v}$ equals the average variance. Cronbach’s alpha is famously difficult to calculate, however most of the calculation can be done through SPSS and this is another benefit of using the test. SPSS enables items to be discovered that may exert a negative influence on Cronbach’s Alpha. In the PhD, I followed Cohen, Manion and Morrison’s (2018) SPSS command sequence for conducting the Cronbach’s Alpha test. Whilst Cronbach indeed contains elements of positivism, this critical examination of Cronbach highlights a reflexive and post-positivist approach to research methods (Bryman 2021). The study does not purely use alpha to determine whether the data has rigour and is reliable, as there is a combination of numeric and non-numeric methods applied. A mixed methods approach additionally considers the trustworthiness and credibility of the qualitative data, and is discussed later in this chapter.

3.4.3 Validity and reliability in questionnaires

Validity in all types of questionnaires (internet, face-face, postal) are seen through the lens of the participants and whether they are answered honestly and accurately. Scholars have raised a concern that more surveys being conducted online ‘bring problems about honesty’ (Fowler 2009, p. 16). For example, it is common for respondents to under report on the amount of screen time they spend on their mobile devices as research shows too much screen time relates to lower levels of psychological functioning (see Przybylski 2019). It is also common for inaccurate reporting if participants are not fully aware of the questions being asked. Initially, I identified that reference to ‘social media’ and ‘social networking sites’ have varied meanings.
to different people. Some educators, for example, may not view YouTube as a social networking site as there is less focus on the profile and it has different interaction features compared with the most popular SNS, Facebook. To overcome this, the answer type to questions such as ‘which social networking sites do you use in your pedagogy’ included a tick box against all the major social platforms, including YouTube.

Highlighting that participants are anonymous in this research supported reliability claims as it encouraged greater honestly, and in comparison, it is difficult for interviews to be anonymous. However, some research does suggest that it is possible for participants to create a different persona and make up responses to a survey when answering online, and this presents problems with falsification of data (Shulman et al. 2011). Due to the complexities of overcoming this, it was an acceptable risk of conducting the surveys online.

A pilot questionnaire to refine wording, length, layout, and presentation are central for a reliable and valid survey. The survey was sent to scholars within the School of Social Sciences, Humanities and Law at Teesside University and this established validity as it called upon expert knowledge. Feedback regarding if the data was meaningful, accessible, or if there were any practical or ethics concerns helped improve the survey before it was sent to the research population.

3.4.4 Validity and reliability in interviews

Some errors which may cause under or overstating the true value is bias, which is defined as ‘a systematic or persistent tendency to make errors’ (Lansing et al. 1961). Cohen, Manion and Morrison (2018) argue that one way to add credibility is to measure with another measure that has already been shown to be credible, in addition to demonstrate researcher reflexivity. This study used Nochumson’s (2020) interview which explored schoolteachers’ use of Twitter and the implications of learning through social media, as a way to ensure the interview remained credible and transparent. Similar to the present research, Nochumson (2020) applied
a mixed methods model consisting of a survey for quantitative data collection then interview to gather qualitative data. Therefore, the interview used is deemed to be credible as it reduced minimized unexpected behaviour by using Nochumson’s (2020) work. Validating the interviews is an increasingly complex and uncomfortable position for post-positivist researchers as it contradicts the idea of social reality being multi-faceted.

In order to maximize researcher reflexivity in interviews, it was important to reduce the bias as much as possible. Hitchcock and Hughes (1989) argue that due to the nature of human interviews, it is inevitable that the researcher will have some bias in the data. Nevertheless, the author became aware of the sources that lead to researcher bias, such as attitudes, opinions, and the tendency to see a response through a certain lens, and thus, it was attempted to minimize any misunderstandings by being clear with the wording of questions for the participants. The interviews were also open-ended which enabled a case centric approach and for unanticipated issues to be raised (Oppenheim 1992). Closed questions would not have provided this benefit. The interview also avoided questions that could be deemed as leading. Leading questions refer to a researcher designing a question that illegitimately influences the answer, Morrison (1993, p. 66) also describes this as ‘putting words into their mouths’. For example, questions such as ‘which, if any social media platforms do you use in your teaching?’

An interview involves much more than simply collecting data and can verge on a social power dynamic with much of the literature concluding that power resides with the interviewer. Lee (1993) and Morrison (2013) claim that because the interviewer generates the questions and the interviewee is frequently under scrutiny, assurance must be given that an interview is about extracting data collectively. In this research, I attempted to minimize this impact by waiting for the interviewee to finish the response, so that I avoided interruption, and prevented patronising the interviewees.
It may be the case that educational research that involves additional considerations to ensure reliability and validity. Greig and Taylor (1999) argue that when working with children an interviewer may have to overcome shyness and reticence, time for establishing trust, consider choice of vocabulary, and pitching questions at the right level. Although, this study did not involve interviews with children, it was important nonetheless that I became aware of all contextual matters in an interview situation. Furthermore, in order to obtain reliable data, I was sensitive and empathetic through using active listening, and this allowed the interviewees to take their time and answer in their own way. Additionally, being a scholar in the subject and primarily involved in synthesising the literature, I had a considerable level of knowledge which allowed for informal conversations, and this became an important part of being a skilled researcher and collecting reliable data in Kvale (1996).

3.4.5 Ethics

Although, ethics in research is primarily focused on what researchers should and should not do, it is not commonly as easy as a ‘black and white’ scenario. At first glance, ethics in educational research considers informed consent, confidentiality and anonymity, non-traceability, sensitive of research, avoidance of skewed data, ownership and control of data, and disclosure (Cohen, Manion and Morrison 2018). There is legislation, regulations and regulatory frameworks in place to provide ethical guidelines for researchers who are expected to take well-informed decisions on a case-by-case basis. However, it is typically the researcher’s responsibility to take on ethical matters that relate to their research (Brooks et al. 2014).

Firstly, in social science research, ethics is defined as ‘a matter of principled sensitivity to the rights of others’ (Cavan 1977 p. 810). Ethics must consider research design, data collection, research relationships, writing and publishing data. The importance of ethics in research is not
understated, with Bell (2000) arguing that a ‘cavalier attitude to research ethics can lead to all sorts of peril’.

In the current research, it was of importance to consider the effects of research on the participants and preserve their dignity as human beings. Selecting an appropriate research design and methods is associated with researcher competence and specific training may be required to meet this. Morrison (1996) and Kimmel (1988) both argue that it is ‘unethical’ for a researcher to be incompetent in their area of research. The author’s background in social science, along with experience in education particularly in the secondary phase addresses some of these issues. Furthermore, the author has a context of providing academic surveys within the education sector for various academy trusts.

Codes of practice, ethics review boards and university ethics committees exist to oversee hurdles for those planning research. Ethical codes and professional bodies, such as the British Educational Research Association (BERA) and its ethical guidelines for educational research (2018) are important for regulatory purposes. An ethical approval form was submitted to Teesside University’s Social Science and Law Research Committee, which reviewed the proposed research for ethical issues (see appendix 4). The ethical approval form followed the University’s six Principles for Research Ethics: avoiding harm to participants, adhering to the highest research standards and compliance, informed consent attained, participants informed of research purposes if possible, ensuring confidentiality, and disclosing any conflicts of interests. Due to the nature of the research in not being a literature-based project, ethical clearance was needed. In November 2019, ethical clearance was obtained by the chair of the school’s research committee.

Participants’ rights, freedom and autonomy are concerned with the principle of informed consent. Informed consent is in place to protect the researcher by placing some of the responsibility on the participant should anything go wrong in the research (Cohen, Manion and
Morrison 2018). It has been defined as a ‘procedure for individuals to choose whether or not to take part in the research’ (Diener and Crandall 1978). I ensured all participants had a significant comprehension of the research project by providing a fair explanation of the procedure followed by their purposes. The study also highlighted the risks and benefits that were reasonably expected as part of the research, with a section detailing how any results were going to be kept confidential. Additionally, informed consent offered an opportunity for participants to ask any questions about the research to the author, nevertheless also report any concerns to the project’s research supervisors and the university’s ethics committee. Finally, participants were instructed that they could withdraw at any time and discontinue their involvement in the study. Participants were also aware that all personal data will be processed in accordance with the requirements and safeguards of the General Data Protection Regulation (GDPR) and the Data Protection Act 2018.

Interestingly, there are some research designs where it is impractical to attain informed consent from participants, for example studies that involve gang behaviour. There are arguments to suggest that informed consent may yield better data because it is a consequence of establishing a rapport and trust between the researcher and participant (Crow et al. 2006). In contrast, an informed consent form may provoke or disturb natural behaviour as participants are aware they are being monitored or observed as with the Hawthorne effect in Oliver (2003). Furthermore, actively seeking informed consent may lead to a narrower range of data.

Obtaining informed consent in internet surveys is not as straightforward as in traditional data collection methods. For example, I did not know the actual person completing the survey and whether they were answering honestly. To overcome this, I obtained their consent by checking an ‘I agree’ box along with hyperlinks to an additional detailed research information form. The informed consent was presented in a way that the participant had to continuously scroll to the bottom of the page before they could accept, nevertheless also in a way that it did
not compromise the efficiency of the survey. ‘Valid consent’ has been a contentious issue in the literature, and research associations such as the British Psychological Society (BPS) contend that there is a blurring of public and private domains, especially in internet research. I decided that the present research was in the private domain, and informed consent, autonomy and the dignity of individuals were all considered.

Ensuring participant data was kept anonymous was one way of addressing privacy and protection concerns. It was important that information provided by the participants did not reveal their identify, so questions that capture school, address, age range, class taught or official etc. was not part of the survey. For data collected using interviews, pseudonyms were used and this is evidenced in the results section. Lincoln (1990) argues that at times privacy could be violated for the public or participant good. An interviewee may reveal information that relates to an abusive teacher or sexual misconduct, for example, and this is where the researcher can give advice about seeking counselling or therapy; however, the researcher must be cautious that they do not act as a therapist or other mental health professional (Oliver 2003).

3.4.6 Triangulation

Triangulation is a technique of using several methods of collecting data in order to successfully map out or explain a particular phenomenon. However, triangulation is not necessarily focused on combining methods of data collection and can include comparing data collection methods. Social scientists argue that triangulation is a powerful way of assuring validity through research (Cohen, Manion and Morrison 2018; Denzin 1970; Silverman 1993). As previously mentioned, research methods represent a theoretical world view as in paradigms, however, exclusive reliance on one method can present researcher bias. One of the advantages of MMR is that a researcher can be confident in they have the advantage of having used different methods of data collection (Lin 1976). Furthermore, the more methods used that contrast each other, the greater the researcher’s confidence in the credibility of the results. For
example, if the outcomes of a survey correspond with those of an observational study either interpretive or in combination, this is triangulation. In the present research, I have greater assurance that the study demonstrated rigour due to fact that the survey and interviews that were administered provided complimentary results.

Traditionally, triangulation has been tied to solving some of the critiques of single method approaches, however a key triangulation researcher Denzin (1970) argues that the mixed methods type is only one type of triangulation, and other types include: 1) Time triangulation, which is the utilization of cross-sectional and longitudinal designs. Diachronic reliability, for example, concerns itself with observations over a period of time, whereas synchronic reliability seeks data gathered at the same time (Kirk and Miller 1986). Time triangulation rectifies omissions to social change and process by studies which are conducted at one point in time. 2) Space triangulation, which attempts to overcome data collected all at the same site or within the same subculture. 3) Theoretical triangulation, which draws upon alternative theories as opposed to a single viewpoint. Denzin (1970) argues that theoretical triangulation is often the most difficult to achieve however this can be satisfying ‘pitting alternative theories against the same data set’. Firstly, the researcher should draw up a list of all propositions which may be able to explain the research phenomenon. Then, identify the different ways each theoretical proposition may be interpreted. The researcher then completes the research and disregards those approaches that are untenable. Once the remaining propositions are reviewed, the research arrives at a new theoretical understanding of the problem. 4) Investigator triangulation, which involves engaging more than one observer or investigator, however that data is collected independently (Silverman 1993). Findings from the observers are then evaluated and compared to develop a broader and deeper understanding of the data. The present study applies instrument triangulation to the research, for example, the application of literature,
the distribution of an online survey, and semi structured interviews to further explore themes. This is illustrated below in figure 5.

![Figure 5. Instrument Triangulation.](image)

*Data has been collected using a literature review, online survey, and interviews.*

However, triangulation is often criticized for being largely positivist and Silverman (1985) exposes this with reference to data triangulation which suggests multiple data sources are superior to a single data source. Interactionists or the theoretical study that derives social processes through human interactions argue that uniqueness, specificity, and fluidness are all key principles, and therefore attempts to measure a single unit more than once violates this perspective (Denzin, 1997). Nevertheless, theorists argue that the foundation of post-positivism is the belief that there are multiple perspectives and not one ‘truth’, therefore, the closest a researcher can get is to ‘triangulate’ approaches to try and solve a problem.

Furthermore, Patton (1980) argues that in qualitative research, having multiple data sources does not necessarily increase validity, reduce bias, increase objectivity, or ensure replication. Importantly, the surveys and interviews did not measure the same foci, and this is a significant distinction to establish. The use of multiple methods are not intended to ‘increase validity’, as they are measure different research activity.
Further critiques of triangulation suggests that there is a correct final position or conclusion, whereas in qualitative research this is not the case (Tracy 2010). Investigator triangulation also proposes some issues, for example, Lincoln and Guba (1985, p 307) contend that it is ‘erroneous to assume that one investigator will corroborate another…particularly in qualitative research’. Regardless, the present study used interviews as well as surveys and this certainly enriched the depth of the results in a way that would not have been possible using a single strategy study, such as emerging themes through the data collection process, adding credibility to the final themes. This way of working is underpinned in critical realism, as argued in McEvoy and Richards (2009), hence, its appropriateness in this study.

3.5 Reflection

Research processes, data collection and data analysis within this thesis have been conceptualised using multiple personal reflections. Some elements of reflection have come from vignettes whilst others have come in the form of developing ideas with academics ahead of decision making. Furthermore, education literature supports reflecting on aspects that relate to improving as a researcher in the TEL and EdTech domain (McFadyen and Rankin 2016). The following section describes the researcher’s journey in developing reflective processes that subsequently, support an understanding of the role as a researcher, the theoretical justifications that align with this, and the personal experiences of using TEL and EdTech, evidencing a reflexive stance towards research:

I was first inspired to explore social media in a PhD capacity when I was working in the private sector and saw how global organisations were using the platform to better interact with their audience, deliver superior training to employees, and integrate key administration with a company’s social accounts. Forward-thinking companies have flourished in the digital age (West 2017), and I was seeing this innovation first-hand. It was when I began working in schools and HEIs, that I
realised this luxury was not available to everyone. Not only was social media integration not available or present, but it was also often rejected by the social actors that I presumed would be its advocates. Reading the literature, I became aware of the long-standing tension between TEL and education (Landson et al. 2015; Junco et al. 2012). I noticed that a significant number of studies focused on HEIs, thus, I became interested in exploring whether or not social media could be incorporated into pedagogy successfully in alternative settings such as secondary schools. The COPPA law dictates the minimum age for users so I first thought that this is the primary reason why universities have been the main focus, however, I learned that in general HEIs have a history of being more accepting towards TEL (King 2015).

Teesside University has long been recognised for its innovative approach to education, and its learning in the 21st century research theme aligned with my research goals. Therefore, despite the main campus being located over 2 hours away, it made sense to return to Teesside University to begin this journey of generating new ideas, theories, concepts, and knowledge supported by agile approaches to learning and engagement.

When I first submitted my proposal for this piece of research, I was primarily a quantitative researcher with expertise in statistical analysis. Although I wasn’t a true positivist, I predominantly dealt with experiments and tests that were measured using empirical evidence (Cohen, Manion and Morrison 2018). One of my initial ideas was to conduct pre and post-tests of groups using social media, analysing both between and within subject means. Yet, this way of working would not generate rich accounts from teachers about professional development occurring in schools.
Thus, I explored qualitative methods and made a paradigm shift to an increasingly post-positivist way of thinking. Post-positivists acknowledge that some facts are value-laden, and interpretations of data are determined by underlying theories (Popper 1968 and 1980). I believe that determining what constitutes as good or bad teaching is very much down to interpretation, therefore, this summarised my view of the world. A further complexity of interpretations is that I am not a secondary school teacher and approach this work from a technical and academic viewpoint, therefore I must attempt to mitigate this during my data analysis.

After discussions with my director of studies in Year 1, we decided a mixed methods model would best suit this research. As I was not a fully fledged member of the qualitative research community, I was aware that the data analysis would present significant challenges. Therefore, the inclusion of a quantitative survey that would help identify the themes supported my claims of reliability and validity (Bergman 2011). Mixed methods allowed me to use qualitative research in complementary ways with my quantitative work. Furthermore, MMR provided me with additional accounts of the complexities in research processes that would not have been possible with one singular method. By choosing a mixed methods approach, I knew that I would be required to conduct more personal reflections and consider reflexivity (McFadyen, and Rankin 2016). I read Cohen, Manion and Morrison’s (2018) Research Methods in Education and found this was helpful in understanding processes of creating a survey from the defining phase through to administering the survey. I learned that there is more emphasis on me as a researcher attempting to minimize any researcher bias. Reams and Twale (2008) argue that mixed methods are necessary and important in rendering less bias and more accurate conclusions.
Additionally, I have spent just under two years creating academic surveys for multi-academy trusts, such as Tees Valley Education, HEIs such as Sheffield Hallam University, and even with the private sector such as Abyasa Limited. Reading Cohen, Manion and Morrison’s (2018) stages to designing a survey, along with applied experience within the education sector contributed to me feeling more confident about designing and developing the survey.

Furthermore, in October 2018 (the start of my PhD), I created a blog-style website where I share the latest education technology news and opinions and delivered reflections on these headlines. My blog, IIT Education (https://iiteducation.co.uk) attracts around 300 visitors a day and has been promoted on social media, mainly on Twitter. During the COVID-19 outbreak, many of the education headlines focused on remote learning and VLEs, and this provided a fantastic opportunity for a reflection using the knowledge I gained from synthesising the literature. I also found this blog to be beneficial for reflective purposes.

In particular, I managed to condense a section of my literature review that explored social media as a pedagogical tool into a short blog post of around 500 words which was freely accessible to a global audience beyond traditional academic dissemination. Specifically, this helped with understanding how an implementation may occur from a school’s perspective, and this is significantly different to a technical one. Examples like this became increasingly significant as I am not an active teacher and converting my academic work into a more practical dissemination was important.

Furthermore, as part of my reflection, I published over twenty YouTube videos that discussed my research and thoughts at that specific time. I think that by speaking
verbally about my research, I have to have a wider understanding of the topic. This would also act as a very early form of viva-preparation.

When it came to writing this reflection, I looked back at my videos and was surprised how much I have developed as a researcher. For example, at the beginning I defined my research aims and objectives, and my academic and cultural context. My blogs and vlogs also helped me reach a wider audience with my work, allowing me to speak to fellow academics in my research area so that my research process evolved and developed.

Outside of my personal blog, I have published articles with the International Professional Development Association (IPDA). IPDA aims to promote and support professional development of education practitioners, discussing policy and practice. Therefore, this was an ideal association to become involved in. My first article titled ‘Fake news: the failures of big tech and education’ addressed one of the big issues at the time and tension between the two. Is it the educators who need to do more for learners in teaching them about digital literacy and how to identify fake news articles online, or does that responsibility ultimately lie with the big tech companies, such as Facebook, Twitter, and Google? Ultimately, I argued that there are opportunities for both actors to reduce spoofers, clickbait, and fake news. However, collaboration between education and big tech is the preferred way of working (Landson et al. 2015).

This article was shared on social media and reached a wider audience than my blog, and this helped with networking, collaborating, finding new opportunities, disseminating reach more widely and building a reputation. The article was ‘liked’ by Raymond Junco, whom I consider a pioneer in the social media in education domain.
At the time of publishing ‘Technophobes versus technophiles: understanding the enemy’s position through reflection’, I was struggling to grasp some of my academic colleagues’ perspectives on social media in education. I approached the head of IT in education, hoping they might have an interesting view on social media. He laughed and said, ‘good luck’, and that he doesn’t use social media and ‘stuff like that’. I thought to myself, if we are unable to get him on board how can we expect to a) convince academic colleagues, and b) innovate within the department. I decided to ask around the department and gather some opinions before writing this piece. I found that the technology moves so quickly, even the ‘experts’ within HEI are soon out of date with their methods. First, they have to learn it, then learn how to teach with it. This is particularly relevant in this research as I believe that educators must focus on developing effective pedagogical strategies rather than focus on the technology itself (Dennen, Choi and Wood 2021). This will allow an educator to easily adapt to other technology in the future. This is form of CPD became a relevant theme throughout the study, and Kennedy (2014) proposes transformative professional development as a way to manage the tension in this area.

The global spread of COVID-19 and the subsequent U.K. lockdown meant that all schools and educational institutes were shut all around the world. This included Teesside University and the learning resources I use on campus. Luckily, I was able to access all my articles online and was not impacted by the lockdown in this way. Despite this, it was estimated that 1.6 billion learners were affected by the measures taken (UNESCO 2020). Amongst the chaos, the education technology and online learning sector have been presented with the biggest opportunity with the rise of e-learning; whereby classes are conducted remotely and online. Some
schools and educational institutes have managed to adapt, some have not. When I first began my doctoral research exploring how social networking sites can be implemented into pedagogy successfully, it was still an interesting yet undesired form of pedagogy for many educators. However, since COVID-19, remote learning has become the new normal for students and teachers with many of the widely known challenges being dilated. To ensure minimum disruption to education programmes, institutes recognised the importance of unlocking the potential of technology for effective remote learning. In other words, the pandemic has brought online learning to the forefront of conversations in education and in the commercial world. I have copied in an extract from my article ‘Reflecting on what COVID-19 means for my research as a doctoral student’ below:

“As part of my research, I sent a survey out to UK educators in January 2020 and so far, I have collected almost 350 responses. However, since the lockdown it has become increasingly difficult to engage in interaction with teachers in my research. Upon reflection, I decided to revise my survey email and include details about how my research fits in with the current agenda of remote learning and COVID-19. Since I revised my email, my response rates have improved. At times, having the ability to be both proactive and reactive in research is important and I look forward to how I can further develop as a researcher throughout this journey.”.

Finally, this research has equipped me with research skills such as reviewing academic pieces of work, submitting ethical clearance documentation, and collecting data in survey and interview form. I have also learned how to successfully plan by following the key stages of conducting interviews and surveys (Cohen, Manion and Morrison 2018). On a personal note, I have also learned how to communicate more effectively with colleagues, and this is evidenced through
some of the networking opportunities I have taken. Overall, I truly believe that an education system that openly discusses social media in their domain, in pedagogy and from an online safety perspective, results in a better society.

Please see link in appendix 5.
CHAPTER 4- FINDINGS

The following section is a continuum of chapter 3, whereby findings from this research will be presented throughout the chapter. The findings that are presented have been gathered using the design and methodology which are discussed in chapter 3. Initially, this section will open with an introduction of the demographic data relating to the participants that took part in phase 2, and this will provide an insight into the context and background of the subjects. Then, this chapter will report on the phase 1 data gathered from the survey and analysed using descriptive statistics. This data is presented using graphs and tables using frequencies and percentages, mean as a central tendency, and standard deviation. A reliability test was conducted during this period and its alpha is reported. Using thematic analysis, phase 2 data from the interviews will be presented, and the author narrates through the codes. Finally, the chapter recites phase 3 interview data where themes from the prior phases are explored in further detail. Names gathered during these interviews have been replaced with pseudonyms along with the exclusion of their official role titles, and the importance of this has been outlined within the ethics section. This study delivers some emerging themes within the field of social media in education, and thus will be summarized to lead onto chapter 5 where these findings are discussed in relation to the literature, and a wider education context. In summary, the key themes identified through this data collection include:

- Continuous Professional Development (CPD) is severely underdeveloped in the TEL domain.
- The term ‘TEL’ may in fact be problematic.
- There is an absence of thought to pedagogy in policy making.
- It is important to distinguish the personal from the professional in a social media context.
4.1 The participants

In total, 434 participants took part in this study; of those, 411 completed the survey (phase 1), 20 were subjects in the first set of interviews (phase 2), and 3 returned for the final set of interviews (phase 3). To qualify to take part in the study, all of the participants had to be a secondary school teacher with Qualified Teacher Status (QTS) with over 1 year of teaching experience; therefore, these criteria excluded Newly Qualified Teachers (NQTs). The demographic data of participants from the data collection phase 2 period of interviews are shown below in Table 23, Table 24 and Table 25 and are represented in appendix 6.

**Table 23. Gender distribution in phase 2 participants**

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>11</td>
<td>55</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 23. Gender distribution in phase 2 participants**

More males took part in the study compared to females at 55 to 45 percent. According to the UK Gov National Statistics for Education 38% of secondary teachers are male, meaning the recruitment was overrepresented by males.

**Table 24. Age and experience (years) of phase 2 participants**

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean (years)</th>
<th>Standard deviation (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>34.75</td>
<td>8.74</td>
</tr>
<tr>
<td>Experience</td>
<td>9.15</td>
<td>6.95</td>
</tr>
</tbody>
</table>

**Table 24. Age and experience (years) of phase 2 participants**

The average age of participants was 34.75 ± 8.74, with ages ranging between 24 and 58. This was lower than the national average age of 39 years, however in the largest proportion
representation group of teachers in 30-39 years (UK Gov Education Statistics 2019). The participants’ experience levels ranged from 2 and 30 years, with a mean average of 9.15 years.

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>Part time</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 25. Employment status across phase 2 participants

The majority of participants worked full time at their school, and this equated to 90% of all participants in the interviews. According to the UK government’s flexible working in schools report (2017), this was higher than the percentage of part time male teachers at 8.6%, nevertheless lower than part time female teachers at 26.4%.

4.2 Phase 1: Survey findings

The following section will present and describe data from the survey and narrate on the tables and graphs that are being shown, for example, in terms of frequencies and percentages. This section will not make interferences or predictions, and instead will simply report on what has been found. The importance of descriptive statistics are that they help the reader to visualise raw data, and thus enable data to be presented in an increasingly meaningful way, which is useful for interpretation of data.

Table 26 describes the frequency and percentage of teachers who are using social media in their pedagogy. This was a question that was asked at the start of the survey and the answer would determine their next round of questions.
In total, 411 educators took part in the online survey, of which 66.7% reported that they currently use social media in their pedagogy. This was higher than the 34.3% who reported that they do not. Participants who answered ‘yes’ moved on to the next round of questions. I ensured that those who did not use social media in their pedagogy still contributed to the data by describing reasons why they do not use social media, and these answers are displayed in Figure 6. The question was presented in a multi choice format whereby the research participants could select more than one answer. In the 141 teachers who answered ‘no’ to using social media in their pedagogy, ‘professional reasons’ were chosen at a percentage of 38.3% (54) by the respondents. This was the highest reason reported in this question. ‘Social reasons’ was the next highest selected at 36.88% (52) with personal reasons chosen by 28.37% (40). Examples were given within the answers to support the framing of professional, social, and personal reasons as terms. These included: professional reasons (e.g., ‘I've heard of negative experiences from colleagues’), social reasons (e.g., ‘I've never seen a demonstration’) and personal reasons (e.g., ‘I don't have the skills’).

‘Other’ was chosen by 26.24% (29) of the participants and 5.67% (8) of participants did not give an answer. Of the 5.67% who did not answer, it is likely that they closed the survey without finishing as this question was marked as mandatory, which means that the participant could not continue without answering.
Participants had an option to elaborate in the ‘other’ box and the full accounts are included below in Table 27. A few educators reported that they have not yet seen any supporting evidence to validate using social media in the classroom. Although social media is a relatively new phenomenon, studies as far back as Junco et al. (2011;2012) have explored the benefits in terms of engagement. Rather than indicating that there was little research in this area, this point was perhaps in reference to evidence of application, in other words, teachers successfully embedding social media in pedagogy and advocating this practice to colleagues. Runhaar and Sanders (2015) reveal that because teachers have worked autonomously and in isolation for so long, interactions involving sharing best practice have a tendency to feel unnatural, thus, impeding teachers from learning from others.

Furthermore, teachers describe their attempts at using it in the past only to be told to stop by senior management. Some of the teachers comment that they are a phone free school and
reference students’ focus levels decreasing when this technology is used. Manu (2021) argues that social media as a classroom resource is doomed to failure unless problematic school leaders enable their teachers the freedom to experiment with teaching tools. Regardless of teachers’ skill levels and abilities, the social and educational challenges that pertain to TEL appear to rest with the policymakers (Slakmon 2017). In this context, the policymaker is the school leader banning mobile phones and social media.

One educator labels themself as a ‘dinosaur’ when it comes to using social media. Finally, the pressure on schools was revealed and this means that social media in pedagogy is an issue that is not deemed as being ‘pressing’ at the moment.

<table>
<thead>
<tr>
<th>Table 27. ‘Other’ reasons why educators do not use social media in their pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ID</strong></td>
</tr>
<tr>
<td>#1</td>
</tr>
<tr>
<td>#2</td>
</tr>
<tr>
<td>#3</td>
</tr>
<tr>
<td>#4</td>
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<td>#5</td>
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<td>#6</td>
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<tr>
<td>#7</td>
</tr>
<tr>
<td>#8</td>
</tr>
<tr>
<td>#9</td>
</tr>
</tbody>
</table>
has a subject specific PE twitter account to keep students and parents up to date with results and news. Give us a follow #10

#10 Filtering settings plus content on social media platforms is not always age appropriate and can be difficult to manage.

#11 We are a phone free school

#12 Used to use it. Told to stop by management.

#13 It requires extra time on an already busy workload

#14 Filtering settings plus content on social media platforms is not always age appropriate and can be difficult to manage.

#15 School won’t allow it

#16 No time

#17 Haven't seen an educational need.

#18 I find it to be distracting and students already receive an abundance of digital information from staff and organisations through social media. I have typically found through experience that students disengage with staff emails and staff social media outlets.

#19 Not quite sure what you mean by social media in this context but assume you mean voting/polls/chats

#20 Social media is for personal

#21 Limited capacity for contacting friends only and have no desire to extend it into the workplace.

Table 27. ‘Other’ reasons why educators do not use social media in their pedagogy.

Of the 270 participants who reported to using social media in their pedagogy, 92% (248) use social media for both personal and professional reasons, and 8% (22) of participants exclusively use social media for professional reasons. An option for exclusively using social media for personal reasons was not needed as this was already screened out in the previous answer. 92% of participants using social media in their pedagogy are also using platforms to connect and socialise with friends on a personal level. Several key pieces of literature, such as
Junco et al. (2011;2012), Landson (2015), and Manu et al. (2021), explore the HE environment as they have previously been increasingly accepting of new technology compared with the secondary schools. However, figure 7 indicates that, similarly, secondary teachers do use social media for pedagogical purposes.

![Figure 7. Participants best describing their use on social media.](image_url)

Participants were then asked to name the type of users they share or connect with online. This question was also presented as a multi choice format, meaning they could select as many user types as deemed appropriate. Participants had options of colleagues, other educators, educational organisations, students, friends and other. The most popular user that educators connect with were colleagues at a percentage of 88.67% (234) from the 270 sample. Educational organisations were chosen by a high number of participants at 73.33% (198). Educators also use social media to interact and communicate with other educators outside their organisation with 70.37% (190) selecting this option. Fewer educators use social platforms to communicate with students at 44.44% (120). This was higher than the user type, ‘friends’ with
only 32.59% (88) of participants sharing content with this group. Of the 5 user types that were available, only 3.7% (10) chose the option of other. These reasons included family, business, carers, and former students and are presented in Table 28. Lambton-Howard, Kiaer, and Kharrufa (2021) argue that the adoption rate of language on social media is determined by the individual features of that particular social media. Whilst YouTube may be used more frequently in the classroom with students, it is not necessarily designed for discussions. However, Twitter is used with colleagues and is focused on generating continuous social dialogue. Figure 9 further supports the work of Lambton-Howard, Kiaer, and Kharrufa (2021).

![Figure 8. Users who participants share and connect with on social networking sites](image)

**Figure 8. Users who participants share and connect with on social networking sites.**

<table>
<thead>
<tr>
<th>User Type</th>
<th>ID</th>
<th>‘Other’ users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colleagues</td>
<td>#1</td>
<td>Family, Business</td>
</tr>
<tr>
<td>Other Educators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Organisations</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>3.70</td>
</tr>
</tbody>
</table>

**Table 28. ‘Other’ users that participants engage with social networking sites.**
Table 28. ‘Other’ users that participants engage with social networking sites.

Once the users that educators engage and interact with had been established, it was beneficial to explore the types of platforms that they were using. Participants were asked about which of the following they use as part of their pedagogy, with the following options: Facebook, Instagram, Pinterest, Snapchat, Twitter, WhatsApp, YouTube, and Other. To supplement the answer types, examples were given of what the author defined as pedagogical uses, and these were: as a planning tool, to support demonstrations, or as a general learning resource. The responses are shown below in figure 9.

YouTube was the most commonly used social media platform with 89.36% (241) from 270 educators selecting this option. This is almost 13% higher than Twitter with 77.04% (208) selecting this. Additionally, figure 9 shows that both YouTube and Twitter were significantly higher than the other options. Beyond Twitter and YouTube, four options were selected by 18-30% of participants. Firstly, 29.63% (80) of participants selected WhatsApp as a platform which had been integrated in their pedagogy. Facebook, Pinterest and Instagram were the next popular at 25.19% (68), 22.96% (62) and 18.89% (51) respectively. The most recently founded SNS, Snapchat (2011) was the least popular with only 4.81% (13) of participants having used this platform in the past. Finally, 3.7% (10) of participants selected ‘other’ as an option with those who entered text in the answer box afterwards all selecting LinkedIn.
Participants were presented with different social media classroom activities and asked their thoughts on the most important and least important aspects of social media in pedagogy. The following activities were included in the list: 1) Creating a social media community (e.g. ongoing support/reflection tasks), 2) Discussion of case studies and reading (e.g. group chats), 3) Online multimedia classes (e.g. YouTube demonstrations), 3) Undertaking group tasks to solve problems (e.g. research), 4) A social media competition in class (e.g. researching real/fake sources), 5) Tutorials with teachers (e.g. Facebook LIVE), 6) Tests/exams of digital proficiency (e.g. social media skills), 7) Traditional written assignments (e.g. blogs/microblogs). The results are presented below in figure 10.

45.19% (122) out of the 270 participants reported that online multimedia classes were the most important activity from the list, which was the most commonly chosen option. This aligns with the results that are illustrated in figure 9, as YouTube was the most popular social media tool.
This was significantly higher than the next most popular which was creating a social media community with 24.44% (66) of participants selecting this. Beyond the first two choices, the remaining choices were chosen by much fewer participants with 11.48% (31) selecting discussion of case studies, 9.63% (26) with traditional written assignments, and 5.83% (16) undertaking group tasks. The lowest scoring were test/exams of digital proficiency, a social media competition in class, and undertaking group tasks to solve problems with only 0.74% (2), 0.74% (2), and 1.85% (5) participants selecting this option. When participants were asked for the least important aspects, some trends appeared. For example, online multimedia classes were chosen as the least important by the fewest number of participants at 1.48% (4) and this corresponds with the result in the most important question. This becomes important for reliability testing. Additionally, tests/exams of digital proficiency was selected as the least important option at 32.58% (88) and this option was selected by the fewest number of participants. This is particularly interesting as one the biggest challenges teachers have with technology is successfully integrating it with feedback, evaluation and assessment (Okojie et al. 2006). Tang and Hew’s (2017) framework proposes that assessment can integrate with social media, yet this is aimed at students and educators in HE. This further illustrates some of the differences between HE and the secondary phase. The next activity that was deemed least important was a social media competition in class, chosen by 21.11% (57) participants, this also scored low in the most important category. Traditional written assignments and tutorials with teachers was selected by 14.44% and 10.74% respectively. Undertaking group tasks were neither seen as most important or least important and only 5.93% (16) participants chose this as least important. Whilst 24.44% (39) of participants thought creating a social media community was the important, 7.78% (21) considered it least important and this was higher than a discussion of case studies and reading and undertaking group tasks to solve problems; both were not deemed as ‘the most important’ by the participants.
Participants were subsequently asked for their views on the most challenging aspects of incorporating social media in the classroom. This was a multi choice question meaning participants could select more than one of the options available to them. The results are shown below in figure 11. There was no significant difference between the top two challenges, professional development, and concerns around the technology itself. Most participants selected professional development at 58.15% (157), and this was marginally higher than
concerns around technology which was chosen by 54.07% (146) of the research participants. Keengwe (2009) argues that there are a range of issues why schools are not successfully implementing TEL, such as CPD. The tension in this area is significantly commented on throughout the literature. Selwyn (2016) indicates that training on digital technologies has a tendency to focus on the actual technology, rather than how the technology can be used in an educational context, therefore, it remains one of most challenging aspects of using social media.

School policy still scored high as a challenge and was selected by 37.41% (101). Only 14 participants selected ‘other’ as an option.

![Figure 11. Views on the most challenging aspects associated with social media in the classroom](image)

*Figure 11. Views on the most challenging aspects associated with social media in the classroom.*

Those participants who selected ‘other’ as an option were offered a mandatory text box to elaborate on their answer. The results are shown below in Table 29. Terms such as ‘online
abuse’, ‘abuse’, and ‘cyberbullying’ were the most popular used. Some participants reported that they were unsure about the impact social media has on learning, and this reveals a developmental pedagogical area. It is interesting that teachers have this view, although, it is unknown whether these opinions have been generated from first-hand experience, from conversations with colleagues or from news outlets. Otchie and Pedaste (2020) argue that although social media may be perceived as being a form of entertainment, the pedagogical interest in the benefits social media may bring to the classroom is growing.

Table 29. ‘Other’ challenging aspects associated with social media in the classroom.

<table>
<thead>
<tr>
<th>ID</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Abuse</td>
</tr>
<tr>
<td>#2</td>
<td>Safeguarding, Cyber-bullying</td>
</tr>
<tr>
<td>#3</td>
<td>Time</td>
</tr>
<tr>
<td>#4</td>
<td>Ensuring all students engage</td>
</tr>
<tr>
<td>#5</td>
<td>Sometimes it feels like we use social media to show off or to showcase what we’ve been up to in class and I’m not always sure what impact it has on learning.</td>
</tr>
<tr>
<td>#6</td>
<td>Identity</td>
</tr>
<tr>
<td>#7</td>
<td>Online abuse</td>
</tr>
</tbody>
</table>

Participants were asked if their school or educational institute provide training or guidance on how to use social networking sites for staff. The frequencies and percentages of this answer are presented below in Table 30. 72.6% (196) from the 270 subjects reported that their school does not provide any training or guidance relating to social media. This is unsurprising as social media may contribute to undesirable behaviours across school. Gonzales (2017) argues that
schools do not consistently teach students how to behave on social media, and that when they are 13 years of age, they can access almost every feature.

Table 30. Frequencies and percentages of schools providing training/guidance on how to use social networking sites for staff

<table>
<thead>
<tr>
<th>Answer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>74</td>
<td>27.4</td>
</tr>
<tr>
<td>No</td>
<td>196</td>
<td>72.6</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 30. Frequencies and percentages of schools providing training/guidance on how to use social networking sites for staff.

Following from the previous survey question, the research participants were asked whether their school provided training/guidance on how to use social networking sites for pupils. The results are shown below in Table 31. 61.48% (166) of teachers said they did not provide any guidance for their pupils about social media. This further illustrates schools’ approaches to social media whereby they do not view the platforms through the lens of pedagogy, and are inclined to view social media as a threat to teaching and learning processes (Otchie and Pedaste 2020). A similarly high figure was reported in the previous question on staff. Additional schools provide guidance on social networking sites for their students when compared to their staff. 38.52% (104) of schools do for staff compared to 27.4% (74) reported in the previous question.

Table 31. Frequencies and percentages of schools providing training/guidance on how to use social networking sites for pupils

<table>
<thead>
<tr>
<th>Answer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>104</td>
<td>38.52</td>
</tr>
</tbody>
</table>
Furthermore, participants were asked on their views about whether social media can be a tool that improves learning, and then whether it can enhance the engagement of learners. These two statements were created in the form of a five-point Likert question, whereby subjects had to note if they strongly agree, agree, neither agree or disagree, disagree, or strongly disagree with the statements. The results are shown below in figure 11. Descriptive statistics show that 33.33% (90) of educators agreed that social media can improve the achievement of learning in their students, and this was the most popular. Additionally, 28.15% (76) felt even more favourably and strongly agreed with the statement. A small number of participants strongly disagreed with the statement at 2.59% (7) whilst 8.52% (23) disagreed. These results are representative of the literature as commenters have long argued that there is an appetite for facilitating social media in the classroom (Manu et al. 2021; Nuraini et al. 2020; Junco et al. 2012).

A similar trend is shown in the second statement, with most participants either agreeing (47.04%, 127) or strongly agreeing (32.59%, 88) on whether social media can enhance engagement in learners. Although more participants agreed than strongly agreed with the statement. Corresponding with the previous question, a small number of participants disagreed and strongly disagreed with the statements at 1.48% (4) and 7.41% (20) respectively. A large number of participants could not confirm whether they agreed or disagreed with the statements. More specifically, 11.48% (31) for engagement, and 27.41% (74) for improving the achievement of learning.

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>166</th>
<th>61.48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>270</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

*Table 31. Frequencies and percentages of schools providing training/guidance on how to use social networking sites for pupils.*
The participants were asked whether their school has a social media group for students. The results are shown below in Table 32. Most schools do not provide a social media group for their students, and this was reported as ‘very high’ at 80.74% (218). Only 19.26% (52) of participants from the 270 confirmed that their school does have a social media group. Schools have traditional methods of communicating messages to students and parents, however some of these methods were highly challenging during the pandemic (Bond 2021).
Table 3.2. Frequencies and percentages of schools having a social media group for students

<table>
<thead>
<tr>
<th>Answer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>52</td>
<td>19.26</td>
</tr>
<tr>
<td>No</td>
<td>218</td>
<td>80.74</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3.2. Frequencies and percentages of schools having a social media group for students.

Closely related to the previous question, participants were asked whether they would like a social media group for students. This question was optional for those who worked in schools with and without a social media group. The results are shown below in Table 3.3.

The split between those who would like their school to have a social media group and those who would not was relatively close. However, more participants (46.3%, 125) did answer ‘yes’ compared to 37.77% (102) who answered ‘no’. Only a small number of participants did not choose to answer the question at 15.93% (43). This further illustrates that, similar to HE, educators are interested in using technology to enhance pedagogy and administrative tasks (Nuraini 2020).

Table 3.3. Frequencies and percentages of participants who would like their school to have a social media group for students

<table>
<thead>
<tr>
<th>Answer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>102</td>
<td>37.77</td>
</tr>
<tr>
<td>No</td>
<td>125</td>
<td>46.3</td>
</tr>
<tr>
<td>No answer</td>
<td>43</td>
<td>15.93</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 33. Frequencies and percentages of participants who would like their school to have a social media group for students.

In the same section as the previous two questions, participants were asked if they use SNS to encourage interaction with classroom activities. The results are shown below in Table 34. More teachers reported that they do not actively use social networking sites to encourage interaction with class-based activities. This was much higher than those who reported that they do not at 37.77% (102) compared with 62.22% (168).

Table 34. Frequencies and percentages of participants who use social networking sites to encourage interaction with classroom activities

<table>
<thead>
<tr>
<th>Answer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>102</td>
<td>37.77</td>
</tr>
<tr>
<td>No</td>
<td>168</td>
<td>62.22</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>100</td>
</tr>
</tbody>
</table>

Following the previous question, participants were then asked if they would like to use SNS to encourage interaction with classroom activities. The results are show below in Table 35. Despite most of the educators not using SNS to encourage interactions, most would like to be able to. Personal, professional and social reasons contribute to why they are not currently adopting social media for engagement (Okojie 2006). 45.55% (123) reported yes compared to only 25.56% (69) who reported they would not like to be able to.

Table 35. Frequencies and percentages of participants who would like to use social networking sites to encourage interaction with classroom activities

<table>
<thead>
<tr>
<th>Answer</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Yes</td>
<td>123</td>
<td>45.55</td>
</tr>
<tr>
<td>No</td>
<td>69</td>
<td>25.56</td>
</tr>
<tr>
<td>No answer</td>
<td>78</td>
<td>28.89</td>
</tr>
<tr>
<td>Total</td>
<td>270</td>
<td>100</td>
</tr>
</tbody>
</table>

*Table 35. Frequencies and percentages of participants who would like to use social networking sites to encourage interaction with classroom activities.*

Finally, participants were asked on their view on the following statement: ‘there are educational and practical benefits for students when teachers are social media proficient’. Participants had to note on a five-point Likert scale whether they strongly agree, agree, neither agree or disagree, disagree, or strongly disagree with the statement. I provided an example attached to this question that read ‘for example, social media skills to help with employability’. The results are shown below in figure 13.
Figure 13. Views on whether there are educational and practical benefits for students when teachers are social media proficient.

More educators agreed with the statement than did not. 51.11% (138) of participants strongly agreed with the statement and this was slightly higher than the 42.59% (115) who agreed. Only 6.3% (17) of participants did not strongly agree or agree with the statement, with 4.07% (11) neither agreeing nor disagreeing with only 2.22% (6) participants disagreeing. From the 270 participants that took part, 0 strongly disagreed with this statement.

4.2.1. Reliability tests

The following section will present results from The Cronbach alpha test to describe the reliability in this quantitative part of the thesis.

<table>
<thead>
<tr>
<th>Table 36. Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Based upon the formula below where $N$ is equal to the number of items, $c^-$ is the average inter-item covariance between the items and $v^-$ equals the average variance, the Cronbach’s alpha is reported at 0.710. The coefficient of internal consistency was yielded using analysis output from SPSS. Konting et al. (2009) and George and Mallery’s (2003) Cronbach alpha scale positions 0.71 as acceptable for indicating positive internal consistency, and this means that items in the survey relate to all the other items and the instrument as a whole. The test was completed against item 3, 10, 11, 12, 13, 14, 15, and 16.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cronbach Alpha if item deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.692</td>
</tr>
<tr>
<td>10</td>
<td>0.693</td>
</tr>
<tr>
<td>11</td>
<td>0.728</td>
</tr>
<tr>
<td>12</td>
<td>0.716</td>
</tr>
<tr>
<td>13</td>
<td>0.643</td>
</tr>
<tr>
<td>14</td>
<td>0.693</td>
</tr>
<tr>
<td>15</td>
<td>0.671</td>
</tr>
<tr>
<td>16</td>
<td>0.698</td>
</tr>
</tbody>
</table>
The Alpha if the item is deleted represents the Cronbach’s alpha reliability coefficient for internal consistency if the individual item was removed from the scale. Cronbach’s Alpha would decrease if items 3, 10, 13, 14, 15 or 16 were removed from the analysis. If item 11 or 12 were removed, the alpha score would increase, meaning the survey would become more reliable. However, these differences are insignificant as the increase would only be between 0.05 - 0.18 and this would not be enough to move onto the good or excellent category according to Konting et al. (2009) and George and Mallery’s (2003) scales. Item 11 related to schools providing training or guidance on how to use social networking sites for pupils, and item 12 was concerned with whether educators consider social media a tool that engages learners in the classroom.

4.3 Phase 2: Interviews set 1 finding

The interviews were conducted on a combination of Microsoft Teams, Skype, Zoom, or Google Meet, and I was flexible in allowing the participants to choose their preferred platform; this was due to the restrictions in place relating to Covid-19. One interview was conducted face to face and in line with the UK Government’s 2020 social distancing measures at that time. This section will present results from thematic analysis, identifying key themes with relevant extract narrative. All participants who took part in the interviews also completed the survey in phase 1.

4.3.1 The benefits of exploring social networking sites with colleagues.

The first major research theme identified is that there is a strong belief amongst teachers that having a network outside their workplace is beneficial for their professional practice. Marketing literature has long argued that businesses and professionals should utilise social media for networking purposes (Hilty et al. 2018). However, education has primarily been
focused on how social platforms impact teaching and the relationships with students rather than professional networks. Thus, it is interesting that secondary teachers see the value in social media for this purpose.

The importance of the professional network is that it enables teachers to interact with colleagues and fellow educators, and this is the preferred way of using social media for most teachers (Greenhow et al. 2020). Teachers described some the benefits of being part of a social network for educators, such as access to professional development, and the ability to view and share resources with anyone from around the globe. These are seen as the biggest drivers to using SNS (Hilty et al. 2018).

“...building up a personal network means that I have an additional support network...” Jack

“...I think it’s probably because with social media I can access CPD through educational bloggers. Some are really good at sharing resources...” Roger

“... a personal network of colleagues that go beyond the school...” Chad

“...you can contact anyone from around the world and see what they are up with regards to teaching...” May

“...I have been frustrated with the national framework and have posted something online and seen that other teachers are having the same frustrations which is nice to see...” Alice

Whilst teachers acknowledge that a support network presents opportunities to share resources, there remains some scepticism about whether the resources that are shared online are better than those shared within school. Furthermore, some teachers stated that in previous years the resources were useful, however, more recently the quality of resources shared online has decreased, and this does not make these resources particularly useful. Similarly, Prestridge (2019) argues that social media can have hidden gems of information for knowledge acquisition and professional development. Teachers in this study are describing the same
phenomena, however, the notion that the useful resources are hidden is not viewed positively by the participants.

“...I usually see great resources online...however, recently there are some ‘not so good resources’...and there’s almost too much to try and sift through...” Steven

“...there are some risks involved (with creating dialogue with educators online). For example, I have seen some terrible resources out there...” Garth

Nevertheless, the quality of resources is not the primary reason why educators have become sceptical about SNS. There is a general concern around welfare and the conduciveness of this ‘personal and social network of teachers’. For example, some teachers identify that there has been a modification to the ‘tone’ of conversations as more people have begun using social networking sites, and the majority of this is negative and can even lead to arguments online. Teachers claim that this environment is not helpful or beneficial to enhancing teaching practice. Bradshaw and Howard (2017) describe social media as having a reputation for trolls and troublemakers, and this is clearly noted by the teachers in this study. Specifically, Twitter as a discussion forum was highlighted as being highly pertinent with this characteristic (as in Bradshaw and Howard 2017; Lundberg and Laitinen 2020).

“...I used to get involved in a lot of progressive work with colleagues in terms of best practice...but there have been conversations around teaching between teachers that is quite demeaning to the profession...” Philip

“... I used to love Twitter because it used to be ‘oh my god, look what I have found’, but over time it has become a battleground for those from different sides of education...” Rick

“...mainly because there is a support network but there is a sense of tribalism. I couldn’t comment from a Facebook or other social media perspectives. I am just talking about Twitter, but it is interesting...” Helen

“... it has become too divisive over the years...” Katy
Of particular relevance, some teachers suggest that it is not necessarily external non-teachers who are responsible, rather it is the teachers and other educational professionals who contribute to the generation of this negative and critical atmosphere. Teachers have a documented history of working in isolation, and this may influence how teachers interact with one another. Runhaar and Sanders (2015) suggest that teachers working autonomously may lead to negative criticisms of teaching practice rather than constructive criticism.

“...I always tell my teachers- when I see something that they have done good- to share it and post it online...but there is just a resistance to it...mainly because of safeguarding, but also I think some teachers are scared what other teachers will say... Oddly enough, sometimes teachers are not the best at giving feedback or praising other teachers...” Heather

When asked about whether there is a place to include students in the social network for educators, teachers were wary of mixing the personal with the social. Some teachers even described themselves being on a ‘different sphere’ to students online. Other teachers reflected that there are essentially places that best suit students’ dialogue, and places that best suit teachers’ dialogue. The separation between personal and professional in the social media context appears frequently in the literature (Manu et al. 2021). It is noteworthy that the personal characteristics of having a social media account are generally well received in discussions about colleagues and other education professionals, whereas, this is the most influential factor why it is not preferred to be used with students. This is despite research indicating that social media may facilitate motivation and enthusiasm for learning outside of the classroom, thus increasing engagement in the classroom (Kara et al. 2020).

“...because students access social media- like Twitter- when they become older...at school they are more concerned with Snapchat, TikTik and Insta(gram). This is because they become more interested in the wider world when they reach A level...” Nicole
“... there is a place where adults meet online and a place where students meet online...they are two different worlds. This is understandably so and has always been the case...” Shane

“... the difference with posting things for students online is that you’re almost allowing them into your life...maybe this is unfounded...” Annie

“...maybe there will be a space but currently there isn’t... this is due to safeguarding and there being nowhere appropriate to do it right now. There is just too much work involved and it needs to be easier... perhaps, Google Classroom is the closest thing for that communication...” Philip

4.3.2 Social media in the personal compared with social media in the professional

The previous question led onto this section where the tangible application of social media was discussed by participants. More specifically, how social media in personal capacities compares with that in the professional capacity and the potential platforms may have or may not have to make educational links. Teachers agreed that distinguishing the personal and professional is a complex issue in TEL, especially in relation to social media. The literature further indicates that some of these complexities are present in TEL generally as with iPads and personal/professional networks (Mayer-Schonberger and Cukier 2013). Thus, teachers have begun making links between social media and other forms of technology in the classroom, and these links are becoming increasingly relevant (Nuriani 2020).

Another key category was the concept that large technology companies, such as Google and Facebook would have already developed an education specific social networking site if it was going to be successful. Teachers also agreed that students would not be interested even if there was an educational social networking site at the school, so this has to be considered carefully. Therefore, the concept of social media does not necessarily work in education. However, whilst it is true that there are not many examples of successful education social media...
platforms, this does not necessarily mean it is because the ideas are flawed. Google and Microsoft are software companies, and approach problems in education from a software developer’s perspective (Martin 2019), and this is different to viewing social media through a pedagogical lens. Scholars have advocated for increased interaction between technology companies and education, and this is perhaps linked to some of these teachers’ comments (Collins and Halverson 2009; Wegerif 2013).

Nevertheless, platforms such as Google Classroom, Microsoft Teams, and Seesaw that provide similar functionality to social media in terms of online dialogue may in fact be a ‘middle ground’, preferred and realistic route to mediate the tension around personal and professional accounts.

“…having an education specific social networking platform or site will be a hard sell to any pupil in secondary school…that’s why I don’t think a new one doesn’t necessarily have to come along…” May

“…I imagine that Facebook and Google have already experimented with this and have come to the conclusion that it doesn’t really work…” Hannah

“…I think if there was a need for it, it would’ve already come along (referring to a new social media education specific platform)…” Josh

“…our CEO runs an EdTech company, and I think if there was potential for a platform to engage students more than what is out there, he would’ve been all over it…there’s no legs in it… I think a much more pragmatic approach has happened such as Google Classroom or Teams that has similar functionality for schools…these are conductive to education delivery but not the day-to-day delivery…” Philip

“…since lockdown, our school has started using a platform called Seesaw. It’s like an education social media but is also a learning management system. I can set work for whole classes or individual students, and there’s a timeline where pupils can post, like and share
content...so very similar functionality to something like Facebook. I think this is a better solution for engaging than Facebook or Twitter. It also protects the teacher...” Alex

Moreover, there are concerns about using the current portfolio of SNS that are available, especially Facebook and Twitter. Teachers argued that there is no quality assurance on these platforms with regards to resources, contrastingly on Google Classroom, the institute or department heads can act as regulators.

“...because resources and the application of social media in general is questionable, there doesn’t appear to be any quality control over it... I suppose when you give everyone a voice, this can always happen...” Toby

“... it’s a safeguarding issue for me, so I don’t really know where I stand in terms of using what’s out there (referring to Facebook and Twitter compared with Google Classroom)...” Will

4.3.3 Technological infrastructure in schools with a particular focus on social media

There were diverse opinions from teachers regarding whether their school was technologically ready for a scenario in which social media would be fully integrated. However, this did depend on the school that the teachers worked in. It was interesting that there is a significant contrast in technology infrastructure in schools only a few miles apart. Yet, this is not entirely surprising as data from the ADSL Broadband Database show that in some postcodes where schools are located, broadband speed can be as low as 2Mbps; the U.K. average is 79Mbps (DeStefano, Kneller and Timmis 2018).

The differentiation between these secondary schools is relevant as it was noticeable during the U.K. lockdown in 2020 (Bond 2021). For example, some schools have a clear and well-defined infrastructure, such as Google products embedded in almost all teaching and administrative activities. Reference to Google and their products was popular among educators, and this went beyond using Google for purely administrative purposes. Teachers in schools
with good infrastructures referenced assessments, and more importantly ‘pedagogy’ in their answers. In contrast, some schools struggled to provide any digital solutions during the pandemic (Bond 2021).

“...we are already a Google Suite school so yes... some of our teachers are Google Educators so we have access to their expertise on this... we are really set up from a technology side...”  
Philip

“...our school are looking at a new way to access pupils online with Real Smart...assessment for learning has aged a bit since then so we are building it back up...”  
Alex

“... we don’t spend money on a network manager, we have really good internal network connections...”  
Will

“...technology was available to me during lockdown, and this complemented the pedagogy side of my teaching...”  
Rihanna

“...previously no but during lockdown our school purchased laptop and iPads for students and even paid for their internet... lockdown has probably expediated this”  
Roger

In contrast, it was evident that some schools struggled with basic technological tasks as teachers reported issues in booking for resources, and support materials from social sites becoming blocked.

“...I think we only have one IT person...most of the videos on things like YouTube are blocked...”  
Toby

“...there isn’t a huge focus on this at our school...”  
Alice

“...yes, we have iPads, but we have to book to use them, and this means planning well ahead of time...sometimes they are not even charged...”  
Katy

“...the first part of the pandemic was hard in terms of staff not knowing what to do online or even how to use their equipment. Once this was overcome, most of our pupils did not have the
correct set up at home. Some have their own laptops whereas others had to share with a sibling from another year. So no, I don’t think we would be ready to do this full time…” Jack

Whilst iPads and computers are viewed positively by teachers, mobile devices are seen as distracting and not in line with the schools’ digital aims. Mobile phones are viewed as being for personal use, whereas there remains a strong justification for using school iPads (Gao et al. 2017).

“… phones are banned at our school because they have a history of being too distracting...we are not as bad as this school I know where phones have to be handed in at the start of the day then collected at the end...yes, that would be hard on the kids…” Chad

One participant suggested that the infrastructure in their school may change if this became an Ofsted requirement or became integrated into the teaching standards. Currently, there is no reference to technology by Ofsted, or in the Teachers’ Standards, however, more recently they have begun critical examinations of school websites (Berry 2021). As schools work towards achieving grading by Ofsted, it is reasonable to suggest that if the criteria evolved to include technology, so would the schools’ approaches to embedding technology into pedagogy (Berry 2021).

“...it would be nice but no...Ofsted would probably need to say that they’re going to look at this first...right now, I don’t think it mentions it in the teacher’s standards...there was a discussion around the trainee teachers in our school and what will happen to them. Nobody knows…” Garth

4.3.4 Why YouTube in particular is so popular among secondary teachers

Teachers agreed that YouTube was the most popular SNS because it was intuitive and the search functionality- which is the same algorithm as Google search- made it quick to explore appropriate videos. Videos, unlike on some platforms were free and not behind a paywall, and
this was a feature that teachers liked. The type of videos that support teachers’ pedagogy are explanatory ones and ones that can visually present procedures such as science experiments. Fatehkia, Kashyap, and Weber (2022) argue that this is one of the reasons why YouTube has flourished in the general population as individuals can watch demonstrations of almost anything from putting up a shelf to building a house.

“...it’s easy to use...” Shane

“...it really depends on the lesson...some use things like YouTube whereas in English or Design it would be difficult to...” Nicole

“...my personal opinion is that its brilliant if you want something really quick...whether it’s an explanatory video or something...” Steven

“...some videos are blocked, but must aren’t...I don’t know how they decide which ones we can show...when appropriate, I use it...” Will

“...in science, it’s great because you can visually see experiments...” Alex

Moreover, teachers were able to distinguish the differences between YouTube and Twitter, where they described YouTube as a beneficial resource to use inside the classroom, whereas Twitter supports reflection and preparation tasks. This is particularly interesting as a significant amount of TEL literature tend to group all types of technology together, making general statements about teaching with technology (Cuban 2013; Selwyn 2016; West 2017). Teachers in this study indicate that the term ‘social media’ is too over generalised as YouTube and Twitter are profoundly different.

“... I suppose the main difference between this, and Twitter is that Twitter can be good to plan and reflect upon your work, and YouTube can be good to as a classroom resource...” Hannah

The research participants considered that the policy makers were responsible for providing the resources that were available for the schools. In some schools YouTube and other resources were chosen and used because they were made available and the wider infrastructure supported
their application. These resources were appreciated in general by a number of the research participants.

“...YouTube is used by all departments and often...” Annie

“...all departments use YouTube, whereas not all staff use Twitter. I think because you can use YouTube without being digitally literate...” Alex

“...probably because there isn’t a paywall...” Chad

“...there isn’t tension because teachers ultimately decide what resource they use...” Jack

One teacher stated that their school are now using ClickView, which is a service that provides teachers with access to video resources to support their teaching. The process is similar to YouTube’s where teachers search for a video you are interested in; however, this is a platform specifically designed for educators with curriculum aligned content. ClickView appears to be an adaption of the social media platform YouTube. Whilst the customer service may be increasingly helpful compared with Google’s, there are high fees involved which makes it inaccessible to most schools.

“...we use ClickView. It’s similar to YouTube but the content is specially created by educators in line with the curriculum...ClickView is much better... they will even find videos by request if they don’t have what you want...” Philip

“...because there are umpteen amount of videos on there...but there are others that are used in our school such as X Academy...” May

4.3.5 Why isn’t there a place for exams and assessments in social media in education discussions?

Teachers were able to describe why examinations are not viewed as important pedagogical activities for social media. Most teachers were wary of the validity of social media platform use with examinations, for example, some mentioned ‘cheating’ and an inability to ‘verify’ the results if examinations were completed via social media platforms. This is illustrative of some
of the primary concerns that educators have with remote or online assessments (Akimov and Malin 2020). These concerns are justified as distance course delivery does present challenges such as accessibility, legality, identify, security and academic dishonesty (Akimov and Malin 2020). Interestingly, this was explored as an option during lockdown however, logistically it proved too difficult to conduct assessments through these channels, thus, they were abandoned in favour of a formula to predict exam results (Richardson 2022).

“...the main issue is concerns around the validity of what goes in...no way of verifying who has done when it goes out of house...” May

“...rarely exams are online at secondary level anyway...” Rick

“...I don’t think we do exams, so this would be a completely new thing for our school to get their heads around...” Toby

“...formal assessment is probably a no. I wouldn’t know if it was a student who would be completing it... there was talk about students sitting exams online during the lockdown but again I think logistically it couldn’t work...” Rihanna

“...unsure if kids would cheat...” Katy

Google was referenced as a potential aid for teachers, with some using Google Forms for mini quizzes and multiple-choice questions for internal assessment. Teachers stated that Forms can be useful for providing instant feedback and this is where the possibility of linking into social media takes place. The need for instant feedback and instant resources was also a theme that arose when discussing why YouTube was so popular, alongside the delivery of live ways of communicating and interacting (Gao et al. 2017; Freberg and Kim 2018).

“...we will use Google Forms to do assessments, especially quizzing and multiple choice...”

“...it is separate to the rest of pedagogy. For example, we teach on iPads, but external assessments are primarily done on paper. We do try and work technology in with internal
assessments...extended writing can be done on Google Classroom through peer feedback, so that social element is being used well...” Philip

“... I suppose it is good for quick and instant feedback...” Heather

Despite the concerns of online examination, teachers acknowledged that the future of pupils completing exams externally or assessment for learning internally may look different in the future.

“...there will come a time where this does change because technology will find a solution to pupils all being in one room and completing an exam...what that solution looks like and how soon it will be I don’t know...” Rick

4.3.6 Professional development in school at present

Whilst teachers acknowledge the importance of being ‘social media savvy’, CPD appears to be less developed in this area. Broadly speaking, CPD in TEL appears to lack any systematic pedagogical thought, with much of the training that takes place focusing on how to use the technology and other administrative uses such as how to book iPads out to use. This reveals the tension with professional development and technology and reinforces the work of Selwyn (2016), Atencio, Jess and Dewar (2012), and Darling-Hammond et al. (2009).

“...teachers certainly need to be skilled up on social media...” Steven

“...CPD happens every year on how students can keep safe and recently social media has played a part in these sessions. It is run by our pastoral team, so every teacher gets the opportunity to take part...” Nicole

“...we do overt CPD on how to use the platforms we have in school...” Katy

“...I am actually in charge of the CPD in this area. We have a Google site where we have user guides and videos on how to use all the IT stuff in our school... it doesn’t make sense for one person to be the gatekeeper when it comes to technology. Our site shows examples of how
Google Chat, Forms and Classroom have been used in English, Art, Maths… it’s the administrative side such as how to do a screen recording, but also links into the pedagogy.

“…when we got the iPads, we were supposed to have training on it but never did…” Philip

“…we have staff training on a Monday and it’s everybody in one room for 1 hour, and senior leadership would basically just ‘big up’ the iPads and talk about how to book them out but never how to teach with them for teaching…” Roger

Some pupils receive a presentation however this also appears to be limited and the objective of this training seems to be which websites the pupils shouldn’t visit or be wary of visiting. This is a contrasting message to sites that they should visit. However, not all teachers were confident that this was happening in their school and this links in the concept of underdevelopment of TEL in general.

“…I don’t think so… I know students receive a presentation of what sites they shouldn’t be going on etc…” Helen

4.3.7 Training on TEL

Teachers were asked to describe the training that takes place and how they would possibly enhance it with thought to administrative and pedagogical uses. Training on TEL appears to be undeveloped in the majority of schools, with teachers being aware that individuals who were delivering the sessions are often underqualified and not ‘experts’. In many examples, it is the busy senior leadership team who deliver sessions. The consequence of this is that there is no strong link to pedagogical, and it is viewed as an ‘afterthought’. Furthermore, teachers are aware that the training they often receive on TEL is not linked to the curriculum with the word ‘technology’ being absent from the Teachers’ Standards. Both of these factors make it difficult for teachers to see the benefits of their TEL CPD (Selwyn 2016; Gao et al. 2017; Fox 2013).
“...I mentioned that there isn’t any formal training happening right now, but we have a good culture at our school where we help each other out when it comes to learning technology...I champion this side of things...” Rick

“...we never get experts in and it’s usually senior leadership who take on the role, but I don’t think they have the time to be fully trained in it and be the experts...” Josh

“...it’s probably an afterthought but there is always mention of training that will be available in the future but never happens...” Toby

“...this is interesting because I was taking about this with a colleague, the technology training doesn’t actually link into the curriculum...” Annie

“...this could all start when training to become a teacher...when I trained a few years ago, there was no reference to technology in the standards...” Hannah

Despite this, schools have adapted well to demands and pressures from COVID-19 with regards to TEL. For example, teachers mentioned that their school have spent considerable money on equipment and training for staff. Of importance, staff have been coached on the social aspects of children working with TEL, such as accessibility in the household. Little research has been published on how schools adapted to the technological challenges presented by Covid-19, however, there appears to be a mixed public perception (Bond 2021). This may be a result of the technology infrastructure, as some schools were able to adapt more efficiently than others. Bond (2021) describes pupils having a variety of experiences in education during the pandemic, partly due to the potential accessibility of the technological equipment.

“...from a senior perspective, if we want staff to do stuff, we have to have some training explaining how to do it...and this is the same way for students...” Will

“...all training resources is in one place to support staff...” Alex

“...we have moved on a long way since lockdown and our school have spent a lot of money in training staff...” Helen
“...we trained staff on the logistics of working on Teams and understanding that some families have 1 device between 3 or 4 and how to manage this...” Katy

The interviews showed that school leaders do evidence successful TEL CPD by applying pedagogy in their technology training. One noticeable example is where teachers act as students in their training whilst the trainers act as the teachers. This mock classroom experience aims to stimulate pedagogical thought from both the teachers and trainers. This is called a ‘double dip’ method, and was referenced by another teacher who describes workshops being more beneficial to gather real teaching experience feedback compared with instructional sessions.

“...firstly, the CPD focuses on the how to use certain bits of technology and where to find things. In terms of the content and the pedagogical sense of training, we encourage a double dip method which is if I am teaching a protocol then I will teach the protocol by doing the protocol and I will ask the teachers to act as students...this really helps staff understand how technology can be used for pedagogy...” May

“...we do it but its more workshop based rather than instructional...the how to use it and all the stuff like that can just be put on a Google site for staff. I am referencing giving staff real training on how to enhance their practice...” Will

‘...concrete examples...” Annie

Finally, as part of this good practice school leaders should discuss the risks of not applying technology in their teaching in a world that is increasingly reliant on digital information. By understanding the risks as opposed to simply focusing on the benefits, this will help to prepare students to enter the work force. This will be a positive development as opposed to merely focusing on ‘cyberbullying’ (Crowell et al. 2020; Lewis 2017).

“...we go through the benefits but give examples on how to use. We also talk about the risks of not doing this in a world that’s becoming ever more so digital...we are competing for attention...”
against social media sometimes…will this better prepare my pupils to achieve better grades and get the jobs they want?…” Rick

4.4 Phase 3: Interviews set 2 findings

I revisited 3 subjects to further explore the themes that had already begun emerging in phase 1 and 2. At this stage, CPD lacking significant thought to pedagogy, confusion around the terminology in TEL and perhaps TEL itself, and confidence around the existing technology having the ability to enhance teaching practice were all themes that had been elaborated upon. Likewise, phase 3 interviews were conducted online due to restrictions imposed by Covid-19. The participants who took part in phase 3 also took part in the previous phases. These participants were selected purposively because they had provided particularly enthusiastic and interesting initial interviews. The participants are what Bryman (2015) notes as ‘key participants’ in qualitative research because of their potential to provide ‘rich’ and ‘detailed’ insights.

4.4.1 Phase 3 key findings

Participants described that the CPD they received on technology focused on how to make lessons fun and engaging for children which is an aspect of pedagogy. Nevertheless, this was limited to education technology with simple features such as the quizzing software, Kahoot. Technology can present opportunities for educators to move from unidimensional to multidimensional and complex pedagogical tasks, however, it appears that the full potential of technology is not being realised (Yelland and Kilderry 2010). Across social platforms and in particular during the lockdown, the research participants emphasised that there were no or only limited CPD opportunities. This was largely due to the implementation of the software or learning platform being ‘rushed’, and the assumption that the teachers would be able to ‘work it out’. Consequently, critical parts of TEL identified by teachers, such as managing privacy and protecting children were missed. It is not uncommon for schools to have additional
challenges when implementing a new system due to the absence of basic computer skills or because pedagogy can appear to be separate to a technical project plan (Pardamean and Suparyanto 2014).

“...we previously used Kahoot- this is probably a close comparison. We did receive CPD on this, but the focus was how to make a lesson with Kahoot fun which in a way is pedagogy because its engagement...” Jack

“...Seesaw is a new app that we had begun using during the second lockdown but unlike Kahoot we didn’t have any training on it. It was kind of one of those things that we knew we had to be better as the first lockdown wasn’t really successful for kids doing work and this is why we started using Seesaw. It was all a bit rushed, and the leadership team was a bit like ‘let’s go for it all throttle’ and it needs to be used by everyone. We started lockdown on the Monday and by the Wednesday, all the teachers were using this new system. I was given an iPad and had to figure out how to use Seesaw, what functionality it had and how to manage privacy...” Alex

“...we didn’t receive training or awareness on cyberbullying. I suppose with more pupils using this social platform, there is always the chance this could increase. So, training would’ve been beneficial. Again, with a lot of things, we had to figure out this ourselves...” Jack

“...prior lockdown, I have never received training on how to use the internet or other tools and apps. There is an expectation that because we use it outside school, we all know how to use it our teaching. So, during lockdown, it was new territory for a lot of teachers as we’ve never had to teach in this way. Before it was optional...” Roger

With limited CPD, staff were given simple instructions that make up part of their job role with new social platforms. For example, staff were told that they should mark students’ work and record themselves teaching. There appears to be an oversight on the ‘how’ to do this in the online environment (Landson et al. 2015). Teachers describe that this leads to technologically
proficient members of the teaching team taking on an informal role such as trainer, or even doing the work for them.

“...my instructions were to record myself teaching, respond to questions, mark students’ work where possible and call parents every couple of weeks. However, in the first few days I wasn’t sure how to approach all this. It was similar to Facebook where you can create a mini online community, but I didn’t know how to schedule work for them to do. I checked with some other teachers, and they were having the same issues as me; none of us had training on this...” Alex

“...I am quite young and confident to play around and explore new systems which is good, but I know some older people who like me didn’t have training at the start and were always messaging me how to do things, and even to do some of the work for them. The importance of being digitally proficient was highlighted here...” Alex

“...after a week or so, we did receive training on how to schedule work and comment to students, but we didn’t have training around pedagogy, such as how to teach with the new technology and more importantly, how to teach effectively...even now, I am still not sure how to properly use it as a teaching tool...” Roger

“...all through lockdown, there has been surprisingly low mention of 'pedagogy'...” Jack

Furthermore, participants mentioned that some of the training was not organised by the school, and they had to seek out training from other members of staff actively. This affirms some of the key commentary in the literature which reveals that schools often do not have a defined technological training policy or a technological schedule for teachers (Greenhow et al. 2020; Bond 2021).

“...in terms of who was delivering the training, I had informal training by asking a teacher who had used it at another school. But, a few weeks in, the training was delivered by the maths teacher, but it was mainly top tips, and summarising the good and bad things...there were
recommendations that videos should only last 5 minutes but at this point everyone was doing something completely different…” Jack

“…no, training was delivered by a teacher in my year. I suppose he is a bit of a specialist in technology, but he mentioned to me that he didn’t know others’ subject knowledge so all the examples were science based…” Roger

“…we did have training by a maths teacher, and they gave examples of ‘good’ and ‘bad’ online practice, but it was really based on perceptions…” Jack

However, there were glimpses of dialogue that suggested schools were aware of the long-standing issue around a lack of quality CPD. This was primarily highlighted to them during lockdown.

“…I had problems at the start of lockdown in terms of how to know who was accessing the work, what the completed work looked like as we never got to see it when it was done. A lot of teachers said the same, so when we went back to school, schools knew they had to provide some sort of training or professional development in this area…” Alex

Teachers were pleased with the additional functionality and some of the education specific social platforms that had been made available. For example, accepting or declining a post that would appear on a timeline. Participants also reflected that features like this increases quality control as well as protecting children from cyberbullying. In particular the fact that parents could access and view a pupil’s portfolio was perceived as positive in terms of adding an additional layer to prevent cyberbullying. This point reaffirms the previous findings in phase 2. Furthermore, it illustrates the importance of a collaboration between technology companies and educators in designing quality software for teaching and learning as there are profound features required by schools, as described in Martin (2019). However, the significance of a pedagogical lens in designing and developing software is often overlooked (Wegerif 2013).
“...similar to social media, students would post their work, it would appear on a timeline then I could like or comment on it. Before going live on a timeline, I could accept or decline a post. I suppose this isn’t possible on actual social media but it does increase the quality control element as well as protecting children from any cyber bullying. I only learned about this after a few weeks as the accept post button was new to me…” Alex

“...in theory yes, but maybe because its school monitored and parents can view if they wish we haven’t seen any cyberbullying during this period...maybe this would increase if a general social media was used so in this regards, we have a good solution. I think parents having access to this platform decreased risks around that...plus the students cannot ‘private message’ each other unless I have set up a working group which is also monitored...” Roger

“...yes, I suppose all the concerns around personal stuff goes away if we use a joint education one like Teams or Classroom...” Roger

In one example, the social platform allowed the teacher to become aware of deeper issues the child was facing in their home life. In this instance, the student posting videos of themselves was perceived by the teacher as a 21st century cry for help. This is well documented in the literature as in Lindly et al. (2022). The literature does present additional benefits of using social media in education that may not be administrative or pedagogical, such as improved motivation, enhanced self-efficacy and the development of leadership qualities (Househ, Borycki and Kushniruk 2014; McLaughlin and Sillence, 2018). Thus, it is interesting that the period of remote learning has highlighted these issues to the educators.

“...nothing on cyberbullying but a pupil posted a video of themselves crying and that raised concerns for us which then prompted the head teacher to call the parents. This would’ve not been possible without the timeline...” Alex

Teachers primarily viewed references such as TEL and technology in education mainly through the lens of using iPads, and this is perhaps a consequence of grouping all the
technology together under umbrella terms. Teachers have already mentioned that social media may be too overly generalised as revealed by the reflections on the significant differences between YouTube and Twitter. Moreover, iPads are generally viewed as an administrative tool that may be used for substituting pedagogical tasks, whereas, social media aims to transform learning (Wulfert 2012; Gleason et al. 2019), and this appears to be one of the challenging issues in the application of TEL in the schools in this research.

“...whenever I think of technology enhanced learning or just the word technology in education, I automatically refer to iPads or computers...” Jack

“...iPads for sure. Because it’s something that kids enjoy using plus when our school has invested in it, it’s something that is always brought up with the term technology and education...” Roger

However, there was acknowledgement that iPads don’t necessarily serve a critical purpose to a teacher’s professional practice, and this is compared with social platforms and interactive whiteboards. This reinforces some of the existing critical appraisals of social media in education as revealed in the work of Gleason et al. (2019).

“...for my pedagogy, the interactive whiteboard is amazing. As an example, our school could function pretty much the same as it did if iPads were unavailable for a day, but not without the whiteboards...” Alex

When using social platforms, there are particular concerns with aspects of pedagogy such as assessment for learning. More specifically, participants consider it difficult to monitor students live in time to give instant feedback, as well as provide quick support such as scaffolding. This appears to be a major limitation to working remotely on social platforms. Richardson (2022) argues that tension can occur when paper assessments are attempted to be replicated online rather than modified. There ought to be a consideration of how questions are asked, enabling students to flourish online, and therefore minimizing the limitations. It appears
that due to the lockdown occurring relatively quickly, teachers were unable to adapt their assessment strategies for online pedagogy. Nevertheless, some platforms have merely been designed for live lessons, and pedagogical tasks such as instant feedback have become something of an afterthought (Richardson (2022).

“...I am trying to think of the pedagogy elements to the training I’ve had...such as one teacher suggested that at the end of some work, add a function where students can mark if the work was easy, ok, or hard. So, I suppose this is assessment for learning, but again, this was just a tip. My only thought and question to that would be how much of that is true. I find that children may not be in that learning mode when doing some work, they’re not producing their best work, and their attitude is different. When I am in the classroom doing assessment for learning I can constantly praise them, and this can motivate them to challenge themselves...” Alex

“...my only concern is that we are unable to scaffold and instantly assess work. This is always overlooked with technology and especially during remote working. Essentially, we never really get a true reflection of where they are at...” Alex

“...videos were a maximum of 5 minutes which is hard as it completely changes structures of lessons. It also takes up more time...” Alex

“...marking has been harder because content is stored all over the places. When I mark a child’s book everything is together...” Jack

“...in terms of marking work, kids who are really good at technology may appear to be doing better than those who do not...” Roger

With regards to the lockdown, teachers expressed that there was a requirement to evolve policy for remote learners. Most noticeably, schools’ behaviour policies needed to be amended to take into account children not completing the work at home. This is viewed as a significant issue when compared to completing work in the classroom. Teachers described some learners not taking part in daily tasks and that the work on these tasks was minimal. Moreover Bond
(2021) argues that it is unfair to expect a similar amount of work to be completed at home as social processes are especially important in generating effective teaching and learning.

Additionally, schools were awarded extra funding for iPads and mobile data and new policies were needed to ensure fair distribution among students. Teachers claim that their workloads have increased because of these policy changes.

“... our behaviour policy has changed. Before lockdown kids not doing the work wasn’t really a thing. I guess it’s my responsibility to manage this. But since lockdown, we’ve had to have a policy on when they don’t do any work -which happens quite a lot around school...” Alex

“... I now have to document who is doing the work which adds to my workload and then raise concerns with senior leadership, so this is a new policy for teachers. In terms of this social aspect being easier and more efficient, I don’t think it is for students nor us as teachers...” Alex

“...more funding was available, so we needed a policy on how to spend and prioritise kids who needed things like data and iPads to work at home. In my school, I had a family of 5 kids who had 2 devices between them, so we sent iPads to them...we also did fortnightly calls home to make sure that there weren’t challenges that we were not aware of or something that they needed...” Roger

“...yes, policy has changed but there is more thought to the children’s’ social wellbeing...” Alex

“... we don’t have a policy on lessons per day. Before it was 6-7 whereas now it’s about 3 but the school aren’t strict on any of this and its almost whatever you can...” Alex

There also appears to be a conflict between the different forms of education technology. Schools are encouraging the use of iPads by teachers, however there are conflicting messages in respect of social platforms. Furthermore, school policy did not change with regards to the use of social platforms or mobile devices. This is somewhat of a paradox as the schools used
social media to communicate key messages to parents (Bond 2021), whilst encouraging students to use tablets or mobiles at the same time as banning these devices in the actual schools.

“...I’ve always thought this. On one hand, we are being told to become more digitally proficient. Kids like to do quizzes and go on iPads.... because when children are engaged, they want to do more and challenge themselves but at the same time, we’re sending out the message that you can’t go on social media or use phones at school. Its mixed messages to students, parents and teachers...” Alex

4.5 Summary of Key Themes

Following a three-phase data collection process, whereby surveys were conducted, interviews undertaken, and then further examined in follow up interviews, I have identified four key themes which are central to this thesis and the following section. These key themes will be identified in the section below and then discussed in detail in chapter 5.

4.5.1 Theme 1: CPD is underdeveloped

The first key theme that emerged through the data collection process was that CPD in the TEL domain is severely underdeveloped, and this is illustrated throughout all the phases of data. Firstly, figure 9 shows that 89.26% of participants use YouTube in their teaching practice, and a further 77.04% also use Twitter. Despite these platforms becoming commonplace in teaching, training delivered by schools on how to successfully use these types of social media is infrequent. Table 30, for example, shows that only 27.4% of teachers reported that they have had specific training in this area. This appears low for a pedagogical task that is as established as YouTube. Moreover, this un-commonality is not limited to staff, when discussing training delivered for pupils on SNS, Table 31 shows that only 38.52% receive this training. The implications of this will be discussed further in chapter 5. The absence of CPD in this area
appears to be a challenge schools face. Additionally, training on TEL in a general context is not embedded in CPD schedules.

Subsequently, CPD in TEL was further explored in phase 2 and this highlighted the gap in infrastructure that many schools have. As an example, Toby reported that “I think we only have one IT person…most of the videos on things like YouTube are blocked”, whilst Alice reveals that “there isn’t a huge focus on this at our school”, and Katie claimed “yes, we have iPads, but we have to book to use them and this means planning well ahead of time…sometimes they are not even charged”.

Successful TEL CPD must be transformative whereby teachers have an understanding on a combination of processes, such as how technology knowledge is related to technology with content. Understanding how this relates to students’ learning supports the application of technology (Koehler, Mishra and Yahya 2007; Mishra and Koehler 2006). However, the results of this research suggest that teachers do not have an understanding of how the technology knowledge is related to the content, as Roger comments “we have staff training on a Monday and its everybody in one room for 1 hour, and senior leadership would basically just ‘big up’ the iPads and talk about how to book them out but never how to teach with them”.

When focusing on social media CPD in particular, this area appears to be delivered by a different team within the school, such as the pastoral team. This proposes that most of the social media training transfers away from pedagogical aspects of teaching and more into an awareness of online safety, cyberbullying and digital footprints; and albeit that these are significant concerns that ought to be taught. Nicole reported “CPD happens every year on how students can keep safe and recently social media has played a part in these sessions. It is run by our pastoral team so every teacher gets the opportunity to take part”.

Finally, when the content of the training is examined, teachers describe the focus on the administrative side of the technology, such as booking iPads out to use, or how to use a
particular technological tool. These findings support the notion that CPD in this area tends to focus on improving technological skills rather than how technology can be effectively implemented into the classroom. Annie argues “this is interesting because I was talking about this with a colleague, the TEL training doesn’t actually link into the curriculum”, and Katy claimed “we do overt CPD on how to use the platforms we have in school”. This theme continues across other aspects of teaching with technology such as cyber bullying, one teacher argued that “we didn’t receive any training or awareness on cyberbullying” despite a rise on the usage especially over lockdown. They continue by saying after the third lockdown they received “instructional training” but they “were not sure how to approach this”. This supports the theme that there is an oversight on the ‘how’ in TEL CPD.

4.5.2 Theme 2: The term TEL is problematic

Historically when products associated with TEL, such as personal computers, calculators and IWBs were introduced to pedagogy, they were first implemented in the education setting and then became popular as a household object. Social media is a paradox in this sense as it has yet to be successfully implemented in the classroom like the previous tools mentioned, nevertheless it has been widely accepted by the general population. This is evidenced in phase 1 where figure 7 describes that over 92% use it for personal and professional reasons compared with 8% who use it just for professional reasons. In other words, social media is used outside of a teacher’s profession or as a ‘household object’. This supports the notion that the term TEL is too generalised and that there are distinctions between the different education technology tools.

Additionally, there has been little critique of the literature embedded in the terminology and acceptance of ‘TEL’. Consequently, this adopted shorthand becomes an issue when there
are complex and problematic social, technological, and educational disruptive constellations. Further implications are discussed in chapter 5.

Moreover, whilst transcribing the interviews, the term TEL was only mentioned by one teacher. Other terms that were popular include ‘learning technologies’, ‘EdTech’, ‘e-learning’, and ‘technology tools’. Despite an agreed consensus of the term ‘TEL’ in the education literature, when teachers think about pedagogy, this is non-existent. Furthermore, when asked about TEL and infrastructure within the school, many teachers used iPads as a reference point or interchangeable term with TEL. In contrast, learning management platforms, and interactive whiteboards were not mentioned unless pursued by myself during the research.

For social media purposes, associating such a new type of educational technology with the term TEL in general, links to cultural, material, political, social and posthumanism complexities. This theme is closely related to Trowler’s (2008) socio-cultural theory, in particular the second proposition and the concept of educators having relationships with tools, and that these influences are important for learning. It is the teacher’s cultural relationship with technology that will determine their social reality, hence should not be underestimated.

4.5.3 Theme 3: An absence of pedagogical thought in education technology

Throughout this study, the author was able to hear education technology experiences from secondary teachers. A common point of reference that teachers referred to was iPads, and this is a noteworthy example of how there is lack of thought on the pedagogical processes involved. In phase 2, teachers were able to reference that their schools had recently purchased some iPads (i.e., the policy), yet no support was given in terms of CPD in a pedagogical sense. Rick reported that despite having new technologies “I mentioned that there isn’t any formal training happening right now”. This model was adopted from generations of governments supporting educational technology in schools without discussing how they can enhance teaching practice
(i.e., Conservative Party Manifesto 2017 where 17 references to technology were made). Consequently, this has led to many teachers receiving low quality CPD.

Both the governments and schools’ agenda appears to be focused on the end product rather than the journey to get there, and this in itself is problematic. This conundrum is explored further in Ingleby, Wilford and Hedges (2018). When discussing social media, a similar challenge is presented whereby school policy doesn’t correlate with the practice that teachers are conducting in the classroom. However, it is a contrasting tension that is particularly interesting as policy seems to be regressive and against social media, as Chad reports “phones are banned at our school because they have a history of being too distracting…we are not as bad as this school I know where phones have to be handed in at the start of the day then collected at the end…yes, that would be hard on the kids”, and Toby comments “most of the videos on things like YouTube are blocked”. TEL literature evidences a positive push on policy, i.e., more iPads and personal computers, despite a negative push on policy for social media, i.e., no Facebook, YouTube sites limited, and mobile phones banned. This is despite teachers using social media regularly in their professional practice. For further reference, up to 89.26% of teachers have used YouTube in the teaching practice, as shown in figure 9. Interestingly, during lockdown, there was a point whereby personal devices were banned from school whilst at the same time encouraged to be used.

Furthermore, phase 2 highlights that teachers are aware of the pedagogical benefits of social media, such as enhancing engagement and learning outcomes. Alex stated “since lockdown, our school has started using a platform called Seesaw… there’s a timeline where pupils can post, like and share content… I think this is a better solution for engaging than on Facebook or Twitter. It also protects the teacher”. Teachers also felt positive that they could approve or reject a post, and that parents could view the platform at any time; the latter was viewed as a feature to combat cyberbullying.
Phase 3 further explored the specifics around the lack of pedagogy, and teachers regularly commented on how it is difficult to assess students work as “those who are really good at technology may appear to be doing better than those who do not”. Assessment for learning was a recurring theme as teachers also referenced that instantly assessing students work to give feedback is difficult and that scaffolding presents a problem. These are day to day pedagogical strategies of a teacher and are seen as important. Finally, some platforms made marking bodies of work a longer process than in books because teachers would have to go to various screens to see the work.

4.5.4 Theme 4: Distinguishing the personal and the professional

The final theme that was identified was that there appeared to be significant scepticism by teachers as to whether social media could enhance the learning and engagement in the classroom. For example, YouTube was the most popular SNS and when asked the most important aspect of social media in the classroom, most teachers selected multimedia classes. This is presented in figure 10 from data collected from the survey. Outside of YouTube, there doesn’t seem to be any particular pedagogical activity that teachers think social media could benefit, with most scoring quite low. Even with tasks that require social interaction such as classroom discussions and group work, scores were low at 11.48% and 5.95% respectively. Figure 10 also illustrates that tests and exams are seen as the least important or least practical form of pedagogy for social media. Phase 2 data supports these initial findings. Phase 3 discovered that it was in fact the enhanced features that would not be available on Facebook that were useful to their teaching.

One of the perceived benefits of using education social platforms was that they had similar functionality to Facebook in terms of a timeline and posts, in addition to enhanced functionality such as the ability to approve and decline posts before students work and comments are shown on the timeline. This theme was heavily explored in phase 3, and teachers argued that parents
having access to the portal meant that cyberbullying wasn’t a major issue as it “added an additional layer” to the problem. This appears to be the preferred option of working with social platforms with students. However, a wider social network on platforms such as Twitter for colleagues and general networking is seen as beneficial. Nevertheless, separating the personal and professional does not necessarily mean no change to policy and this was highlighted in phase 3. New policies were introduced especially with regards to behaviour and who to allocate equipment to.

4.6 Reflection

In this short section, I provide a reflection that gives a personal insight into working through this part of the thesis. The main purpose of this reflection is for me to provide an account of my experiences in a particularly abnormal year in education, and more specifically data collection amidst Covid-19. I reflect on my personal academic growth and my subsequent development and understanding, most noticeably adapting to recruiting research participants online, conducting interviews remotely, and analysing research data:

I conducted my first interview face to face; however, this wasn’t under normal circumstances as the interviewee was in my ‘bubble’. This interview took around an hour and was in a relatively informal setting whilst I made notes. At this point, I had other interviews confirmed and I had always discussed with the interviewees that they may have to be conducted online. This was planned before the lockdown and I made the necessary adjustments for online interviews, such as having a document ready to share via computer screens. I followed Cohen, Morrison and Manion’s (2018) steps to conduct an interview online.

My first few interviews online were conducted via a combination of Teams, Zoom and Meet, and this was largely because I gave the subjects the option of their preferred platform. Consideration of participants is extremely important, especially
in online interviews where it can be complex to build a rapport and ensure that the participants are comfortable. I have had personal experiences when I have been invited to a conference or event online on a platform that I am not familiar with and it can be overwhelming, thus, I wanted to reduce this burden for the participants (as in Kvale 1996). This is in contrast to how I would usually work in quantitative research as I wouldn’t acknowledge social and informal interactions as being particularly important for an experiment (Hammersley 2013).

Most participants did opt for the Microsoft product, Teams, as they had been using it in their school. Most schools subscribe to either Microsoft or Google products almost exclusively, and although I first noticed this whilst scheduling the meetings, this became quite significant in discussions around schools’ CPD offering. For example, in schools that used Google products, there were Google Certified Educators and Trainers; in other words, experts in using these products for pedagogy. Microsoft also provide similar certificates for educators yet these are nowhere near as successful. I noticed that schools using Google products were more pandemic ready.

Firstly, and with regards to the sensitivity of the individuals’ contexts, I was aware that participants were working from home and had to juggle responsibilities of working and home-schooling in a limited space at home. I was sensitive to this wider context henceforth; I thanked the participants and showed my appreciation for taking part in the study- perhaps even more so because of Covid-19. I also allowed a few minutes to chat at the beginning, and most of the participants described the challenges that they had to manage throughout lockdown and remote learning. Although, as a person I became sympathetic towards the participants in this regard, it did provide an appropriate introduction to commence the interview.
questions. James (2016) argues that the potential differentials of power between the interviewer and interviewee can be reduced by working this way.

Some participants did not turn on their cameras, and I found the reduction in non-verbal cues difficult to manage as there was less information available to me as the interviewer. This was one of the disadvantages of conducting the interviews online. However, in discussions around sensitive topics such as criticising senior leaders, the opaqueness of cameras being switched off may have been an advantage (Pearce et al. 2014)

My director of studies recommended recording the interviews and making partial transcripts later. This allowed me to almost double-down on my listening skills and focus on any social and digital interactions. Despite this, most participants did choose to switch their camera on, and I found this visual easier in the introduction, more natural to build rapport, and useful in general communication. My priority was always to make the participants feel comfortable and that is why, although I perceived it as better to have a webcam switched on, I did not mention it or make it a requirement for interviews. Interestingly, at this point in time, I interviewed for an academic role at a university and ‘cameras on’ was specifically mentioned as a requirement to interview; I still think this is a contentious point in academia and the wider public, and there is little supporting research to suggest that data collected without cameras off is significantly different (Pearce et al. 2014).

The benefit of recording the interviews was that it made transcribing data highly efficient. In particular, Microsoft technology transcribes most of the speech which made the process quicker. If I conducted the interviews in person, transcribing would take significantly longer and may have resulted in inaccuracies, thus, I argue that conducting them online supported my reliability and validity claims for the
data analysis (Nochumson 2020). I recognised the importance of this when transcribing other calls which at times took me up to 7 hours per call; again, this may be down to inexperience in this area. However, Cohen Morrison and Manion (2018) argue that a one hour interview can take anywhere between four to 10 hours. Another benefit was that it allowed me to watch myself asking questions and reflect on my strengths and weaknesses as an interviewer. Looking back, I was pleased with how aware I was of the literature and EdTech in general. For example, I gave appropriate examples that resonated with the participants around the history or TEL and teaching and learning remotely (van Raajj et al. 2008). However, when asking questions, I noticed that I spent significant time asking the same question but in different ways. Initially, I did not know why as my notes were brief consisting of just a one-line question. However, upon reflection and examination of the literature, there was a clear power dynamic between me and the teacher. I am a non-teacher without QTS and approached this piece of work using a refined technical lens. In fact, with my purposeful sampling criteria, I would not have met the requirements to take part on my own study. I believe it was my lack of understanding and knowledge in the area that resulted in some of the wording of my interview questions not being suited to the correct audience (Miller et al. 2009). I subsequently refined my questions to ensure that the simpler phraseology would generate a data-rich response. In contrast, I think my positionality was useful at times as I was able to provide technical prompts or describe a feature or function in a relatively concise way that a teacher and non-technical person may not have been able to do. I have a unique position whereby I have expertise in both education technology and pedagogy, meaning that my research does have implications for teachers and software professionals alike. Some of the tension between educators
and technology come from a lack of collaboration between the two in developing and designing technology for education (Otchie and Pedaste 2020). Some of the TEL research often lacks a grasp of the software developing agile process. When I speak to academics, I often have to act as a consultant, advising them on why they would like certain buttons in certain places as they attempt to replicate a classroom experience rather than transform it with technology (Pucentedura, 2013).

My interviews lasted between 20-65 minutes, but in general, as the weeks went on, the interviews were conducted quicker. This was partially because key themes were beginning to be generated, and this meant that I was increasingly aware of what was relevant and what was not. Moreover, I became progressively confident in my ability to guide the participants back on track. As the timeline progressed and I became increasingly familiar with speaking to teachers, the differentials due to the power relations reduced (James 2016).

I had prior experience conducting reliability tests from some of the quantitative work I have carried out. I enjoyed working within SPSS to generate a Cronbach’s alpha, but I did need a refresher on how to do this. I found reading how to conduct the test less helpful than watching videos of researchers carry out the data input. Having free access to a platform like YouTube was especially advantageous. This was similar to how I approached thematic analysis, I watched examples and case studies of how the process works with real data from Nottingham Trent University. If I was to describe my approach fairly, I think I went into the interviews quite naive in what I thought the teachers knew about technology in education. I think this was because I have had negative experiences coaching educators how to use technology in their pedagogy. This perhaps meant that there was an oversight of the importance of the power relations with the interviewee. Additionally, my
background is in quantitative research and this influenced my thinking, as most quantitative researchers emphasise empirical evidence and objectivity in research (Ions 1977).

Nevertheless, at times I was speaking to highly experienced teachers who had up to 15 years of practice and who were very aware of TEL, and the potential social media may have in education. Overall, most teachers were very knowledgeable about technology in education with regards to functionality, school policy, and CPD. Additionally, I had heard technological stories from other researchers and academics who used some of the online platforms. Luckily, there were no incidents or ‘you’re on mute’ and ‘can you hear me’ scenarios. I largely attribute this to giving participants the option to conduct the interview on the platform that they were most accustomed to. There could have been issues regarding broadband connectivity or not being able to provide adequate adjustments to those with disabilities. Fortunately, no participant was disadvantaged by these technological limitations.

Phase 3 was the final part of my data collection, and the main difference between this and phase 2 was that the U.K. had entered another lockdown. Education was again at the forefront of conversations with a campaign to continue to provide school meals whilst schools were closed being particularly significant. On a personal level, I felt that this research albeit significant in a 21st century learning agenda, wasn’t a pressing issue for teachers during this period. This did not impact data collection, but the topic did present itself in most of the phase 3 interviews. This has stimulated another potential avenue for me as a researcher.
CHAPTER 5 - DISCUSSION

In this chapter, findings from the three phases of data collection will be discussed in the context of existing literature, theoretical perspectives, and personal reflections. There were four major themes that emerged within this study, and these are: CPD being underdeveloped, the challenges associated with the terminology in education technology, an absence of pedagogical thought to teaching and learning with technology, and the need to distinguish between the personal and professional in a social media context. More specifically, there are significant issues relating to CPD in education technology, such as a primary focus on the technology itself rather a foundation based on strong pedagogical strategies. In this way, educators are unable to adapt to the changes and developments new technologies may bring. Furthermore, leaders in schools that deliver technology sessions are overly focused on either the end product that is ‘we use technology’ or administrative uses of a product such as booking out iPads. With regards to social media, the content in training sessions appears to be based on pastoral elements of online platforms and digital footprints. There is an absence of pedagogy in formal and informal training sessions despite over 90% of teachers using social media, and this is a recurring theme in TEL generally. I argue that CPD ought to be transformative and consider prior relationships with tools such as technologies.

Moreover, few teachers were aware of the term ‘TEL’ and had a preference for terms such as ‘EdTech’ ‘learning technologies’ and ‘e-learning’. I argue that there are profound differences between the different technologies, and generalisations or groupings of terms such as ‘TEL’ are misleading, leading to complex relationships between people and technology. Teachers acknowledge that iPads can be used to substitute tasks in a classroom, whereas interactive whiteboards transform pedagogy in meaningful ways. In other words, teachers may struggle to adapt to teaching without IWBS, yet they could comfortably manage without iPads for a day. iPads in particular was used as a reference point by teachers and this influences
attitudes, values, and preconceptions of social media. I argue that there are distinct differences between different technologies, and social media can transform teaching through modification and redefinition. Another way social media is distinctive is how it is widely used across the general population. In comparison, other technological tools have been implemented in educational establishments prior to general use (as with personal computers). This notion may present a conundrum for the wider TEL agenda and future developments.

The global pandemic and subsequent lockdowns have expediated a digital agenda that has been particularly beneficial for this piece of research. As an example, new technologies and platforms were purchased by schools, with some thought to school policy as with providing data and laptops to ensure learning was accessible. Nevertheless, many of the platforms that were chosen as a remote learning solution failed in important pedagogical fundamentals, such as assessment. Assessment for learning was overlooked during decision making on choosing a particular platform, and this is representative of education policy towards technology. During the period of remote learning, mobile phones remained banned in school for learning whilst simultaneously encouraging students to use apps, platforms, data etc. This oversight perhaps influences the CPD in this area.

In discussions around social media and other educational social platforms, there were profound confusions about the most appropriate platform to use in pedagogy. In other words, connecting with students through platforms such as Twitter is difficult due to concerns around personal information, whereas this may be a potential opportunity to network with colleagues and other industry leaders. Perhaps in the future, an educational platform may be the best place for social media and pedagogy to form a relationship? Teachers gave accounts of successful applications of platforms such as Google Classroom, and Seesaw, and this was primarily driven by the additional functionality that met teachers’ expectations that was education friendly. As an example, teachers could invite parents to the account, and this was seen as particularly useful
for combatting cyberbullying, which was described as a major restriction highlighted in the literature. Furthermore, the inclusion of a timeline where teachers could accept or reject posts made for a comprehensive, safe, and working environment. These advancements are some of the examples that ensure a productive teaching and learning environment when compared to Facebook or Instagram that are seen as distractions.

In this chapter, I illustrate my findings using a framework that is a development from Tang and Hew’s (2017) work with thought to transformative CPD and Kennedy’s (2005) models. The ideas are discussed in a wider education technology symposium and explored through Trowler’s (2008) socio-cultural approach and the significance of using this lens is exemplified using teacher accounts from the interviews.

5.1 Introduction

Social media was initially defined by the marketing industry as ‘a part of our everyday communication and information sharing’ (Spencer 2014, p. 323). The main purpose of social media was to bring individuals together in a ‘community for us all’ (Zuckerberg 2017), it was not one for education or learning support (Junco et al. 2012). Yet, educators have become increasingly involved in how social platforms can be used in an educational context, either in ways for professional ‘social’ networking, to create digitally competent graduates, or perhaps increasingly contentiously as a pedagogical opportunity. Furthermore, there is an interesting rise in academic programmes that also involve digital learning. It is argued that schools and educational institutes have evidenced successful implementations of TEL in the past, such as IWBs and VLEs, however, there is growing apprehension that social platforms are discouraged as a classroom tool. There appears to be a difference in policy and attitudes towards social media compared with other classroom technologies. Fox (2013) outlined three reasons why few schools implement social media learning strategies in their programmes, and these include: a) the ambiguity of how to implement technology effectively, b) accessibility to all students
and c) does the potential outcome outweigh the additional workload? The absence of social media in the classroom could have longstanding effects on the future workforce. Furthermore, West (2017) argues that SNS yields over 70,000 job vacancies at any one time and omitting these skills from the classroom is highly irresponsible.

Nevertheless, the benefits of using social media for pedagogical uses are becoming well publicised (Junco et al. 2011; Juno et al. 2012; Junco, Elvansky and Heiberger 2013), and this has accelerated the debate on how best it can be used to promote learning and improve engagement. The U.K. lockdown has expediated these debates, with technology becoming the forefront of education agendas. Studies such as Landson et al. (2015) established that engagement on tasks involving Twitter can be as high as 95%, with Tang and Hew (2017) further proposing that tasks can range from communicating, assessing, and collaborating, hence there are some pedagogical benefits of working this way.

There are other perceived benefits that show usage on social media can result in improved motivation, enhanced self-efficacy and a development of leadership qualities (Househ, Borycki and Kushniruk 2014; McLaughlin and Sillence, 2018). Those who feel marginalised by disability, migration or sexuality are introduced to a wider selection of peers, thus benefitting their social well-being in the education domain. Embedding social platforms would align with student centred education principles that are now deeply established in the U.K.

There is a large body of literature on TEL that illustrates a professional development conundrum (Kennedy 2005), and this is reflected in social media and pedagogical discussions. Moreover, there appears to be a lack of pedagogical thought across TEL processes, and an example of this is the active encouragement of using supplementary iPads or tablets in the classroom to substitute tasks rather than modify or redefine pedagogical strategies. Teachers are also apprehensive about cyberbullying on social platforms and these concerns are supported by the NSPCC (2012).
In chapter 4, the findings that were gathered through three phases of data collection consisting of surveys, and two rounds of interviews are revealed. Survey responses were analysed quantitively through descriptive statistics, and both sets of interviews were analysed using thematic analysis (Braun and Clarke 2006). The methodology of this study was underpinned by Trowler’s (2008) socio cultural theory, and this influenced how the themes began to emerge during the subsequent thematic analysis. For example, rather than well-defined themes appearing instantly, they developed through the whole process of thematic analysis (see Appendix 3). The key themes that emerged through data collection will be discussed in this chapter and linked to the technology in education literature. It is of relevance to acknowledge that this study is neither quantitative nor qualitative rather a combination of both, i.e., mixed methods, and as such, discussions are in the context of triangulation.

5.1.1 Theme 1: Initial discussion of CPD conundrum

The most prominent theme that has emerged is that CPD in the context of social media is severely underdeveloped, and this is reflective of most TEL CPD within schools at the secondary level. This is despite there being an obvious requirement for training in this area. Data showed that teachers were regularly using social media platforms, as such 89.26% of participants use YouTube in their teaching practice, and a further 77.04% also use Twitter either for networking or personal reasons. Nevertheless, a large portion of teachers have not received any training on these particular social media platforms. Additionally, the training that was delivered to teachers was often late and significantly after the implementation period (i.e., after a rollout to begin using in classrooms); this was further illustrated during the lockdown period. In other words, teachers were charged with using a learning system that they had very little or no training on. When the content of training was explored, teachers at best received training from members of the pastoral team and sessions were focused on online safety, digital footprints and cyberbullying rather than pedagogy. This practice is perhaps why some of the
literature argues that there is an invisibility of significant pedagogy in the central TEL context (Lusted 1986; Ladwig et al. 2007; Giroux and Shannon 2013). Moreover, this supports the notion that social media is not viewed as something for pedagogy rather a concern or trepidation for pupils. The data also revealed that there is a lack of training on SNS for students as well, and this has further elicited the argument that the workforce is struggling with a lack of appropriate digital skills, and in particular soft skills (Churchill 2019). In phase 1, teachers welcomed the possibility of some social media training for pupils in schools where it was absent.

The possible reasons for the unsubstantial CPD could be a result of a lack of digital infrastructure in schools. Some schools have a solitary IT person who manages the technical aspects of IT such as privacy software and charging laptops, whereas in terms of TEL, schools do not have a clear representative rather it is a teacher who is self-taught and supports less IT savvy educators. This finding does indicate the lack of a link between pedagogy and technology. Therefore, the training that is delivered is often short, instructional and heavy on administrative uses, whereas, this is different to training that can focus on a range of effective training models, such as the ‘double dip’ method. This is often referred to as the transformative model by Kennedy (2005) with its key characteristics being a combination or practices and conditions for educational change. There was little ‘transformative’ practice described by teachers in the data. In this instance, transformative CPD would include a community of practices that considers how technology knowledge is related to technology with content (Koehler, Mishra, and Yahya 2007; Mishra and Koehler 2006). The oversight on the ‘how’ in relation to TEL CPD may indeed be a distinguishing factor that influences secondary teachers’ engagement with social networking sites in their pedagogical practice.
5.1.2 Theme 2: Initial discussion around TEL terminology

Furthermore, the data revealed that the term TEL is in a way problematic, as an example, few teachers were able to define the term with most participants viewing technology in education through the reference point or lens of iPads. Other terms that were popular included ‘learning technologies’, ‘EdTech’, ‘e-learning’, and ‘technology tools’. However, teachers described their acknowledgement that iPads were more of a ‘novelty’, concluding that if their school did not possess a sufficient number of them, this would not impact on their teaching practice meaningfully. When compared to other technology in the classroom, such as IWBs, teachers argue that they would struggle to function even for a single day if this tool was absent. I argue that the term TEL is too generalised and that there are profound distinctions between different tools, and as teachers argue, there are some tools perceived as useful whereas other tools can become idle in the classroom. The importance in this context is that social media is often described as a paradox where it was implemented in the classroom after it became a popular household object, and this is different to when personal computers, calculators and IWBs were introduced to pedagogy. Data supports this claim by evidencing 92% of participants using social media for both professional and personal reasons. In other words, social media is used outside of a teacher’s profession or as a ‘household object’. Part of this theme links into the CPD and the idea that generalisations that do not consider cultural, material, political, social and posthumanism complexities is irresponsible. Additionally, this constitutes to Trowler’s (2008) socio-cultural theory argument that describes the teacher’s cultural relationship with technology in its second deposition. Moreover, this is further demonstrated when teachers described the policy regarding different TEL products. As an example, iPads and personal computers were encouraged by leadership teams through staff training or announcements that informed teachers of the economic impact that purchasing iPads had (i.e., how much they cost). In contrast, Facebook, YouTube, and mobile phones are banned in many schools. In schools
that make YouTube available, there are restrictions on the videos that can be viewed; most interestingly, the restrictions still apply to teachers. The judgement of what is and is not appropriate does not reside with the teacher or pedagogical expert. Interestingly, during lockdown, there was a point whereby personal devices were banned from school whilst at the same time encouraged to be used in order to engage with the curricula. This intensifies the tension caused by overgeneralizations and groupings of terms such as TEL.

5.1.3 Theme 3: Initial discussion on policy and pedagogy in TEL

The third key theme that evolved through this data collection process is that there is an absence of pedagogical thought in education technology and social media. This is exemplified in the previous two themes with particular mention to the use of iPads with no CPD, and an active engagement on using some platforms beyond others without consideration to teaching practice. In essence, schools have purchased iPads as a wider initiative or policy, yet the data reveals they are unsure how to use this technology effectively so that it not only substitutes tasks, but also transforms pedagogy, for example by the creation of new tasks that would not have been possible without technology (i.e., the SAMR model). In this way, teaching and learning with technology is appropriately transformed. The data shows that some features are welcomed by teachers such as accepting or rejecting a students’ post, and including parent access to combat cyberbullying concerns. Functions that are similar to platforms such as Facebook and Twitter with an educational specific enhancement are well received. Despite this, throughout the data collection process, assessment for learning was a recurring pedagogical task that was often overlooked. Teachers were concerned that instant feedback, or live marking was significantly disrupted by the technologies. This is a teaching and learning strategy that appears to be ignored when iPads or similar technologies are encouraged by school leaders. In this way, attitudes and values towards technology become complex. Furthermore, during lockdown and the rise of the use on social platforms, school policy did not typically
consider pedagogy at that time. Teachers discussed their experience of marking and assessing on using technology as a school requirement despite work being on multiple screens, in multiple files and being time consuming. When processes become slow and extensive, tension occurs between these educators. It is important to acknowledge that these findings are supported by the literature across the education spectrum (Passey 2014; McKay et al. 2014; Junco et al. 2011). There is a wide consensus that the relationships between educators and policy makers have typically been tense. The presence of technology constitutes a demand on teachers to sharpen their educational vision (Lund 2004; Biesta 2016). Although, this can often be deflected (perhaps rightly) to those who set education policy; design guidelines to deal with social and educational challenges lie with the policymakers (Slakmon 2017). The government must consider how children socialise and use digital technologies before any significant curriculum evolution takes place. Moreover, in 2015 the Conservative Party made 17 references to the word technology, and in 2017 they made 30 references (Conservative Manifesto 2015; 2017). There appears to be a focus on the end product rather than the journey itself, and this conundrum causes leaders in schools to have an oversight on the ‘how’ social media can be incorporated successfully. I argue that this theme illustrates the relationship between social networking sites and education, and interestingly factors that influence teacher engagement with the platforms in their pedagogy.

5.1.4 Theme 4: Initial discussion on the significance of social media in the personal and professional domain

The fourth major finding from the data collection is that with regards to social media there is a necessity to distinguish the personal and the professional. When engaging with colleagues or other education professionals, platforms such as Twitter are useful to build up a personal network. However, social media platforms as they are currently, are not sufficient for teaching and learning, in contrast to education specific platforms such as Google Classroom, Seesaw.
and others that successfully incorporate the educational considerations that teachers require. The data shows that outside of multimedia demonstrations on YouTube no other pedagogical task is seen as realistic on platforms such as Facebook and Twitter. More specifically, even tasks that are heavily associated with social interactions such as group work and classroom discussions scored 11.48% and 5.95% respectively.

Instead, teachers preferred the platforms that they used during the lockdown period as it consisted of enhanced functionality that addressed some of the limitations of previous thought-out platforms. These included accepting and declining posts by students, assigning individual work and granting parental access. In conclusion, there are distinct differences between communicating with colleagues in a networking capacity, and students in a teaching and learning capacity and this influences the preferred social platform. Thus, the author argues that frameworks and guidance ought to consider the intended audience ahead of an education social media strategy.

5.2 Theme 1: The relationship between educational institutes, technology and the associated CPD

Issues around professional development modules in education are long standing and debates about the effectiveness of CPD go beyond the recent technological advancements. Although education professionals agree that effective CPD is important for success as a practitioner (Kennedy 2005), and subsequently the learner (Atencio, Jess and Dewar 2012; Darling-Hammond et al. 2009), the ‘how’ to deliver successful TEL remains contentious. Some scholars (Webster and Wright 2009) have argued for a ‘whatever works well’ for that particular individual model, whereas other academics including Aileen Kennedy have attempted to address the spectrum of CPD models.

The literature in this area has a tendency to focus on primary, secondary and HE levels, bypassing FE which is not ideal to gather a holistic picture of CPD needs in education (Brooks
and Gibson 2012; Kennedy 2005; Ingleby 2015). Nevertheless, this does meet with the present research objectives which are primarily concerned with social media and TEL at the secondary phase. References to HE are purely contextual and are used primarily to provide a comparison of TEL activities. Furthermore, there is support in the CPD literature for social constructivists’ approaches to teaching and learning. Trowler (2008) makes this link by arguing that exploring social interactions with ‘tools’ supports understanding how effective CPD can facilitate teaching and learning in the 21st century.

This study noted three important findings in relation to CPD, the first being linked to ‘how often’ teachers were trained on TEL products, and more specifically on social media. This was interesting due to the number of teachers who were engaging with social platforms such as YouTube and Twitter. This could be further exemplified by exploring the number of pupils using some form of social media, and the requirement for teachers to be skilled up in this area. Initially, it may be assumed that teachers work in ad-hoc ways for this type of training with the lack of scheduling of these sessions mentioned in the data, but this was not the case. The OECD (2005) identified that the purpose of CPD includes task-oriented development for staff for new functions, policy changes or problem solving, and thus, CPD ought to be relevant and adopt social media. Moreover, transformative CPD must consider a variation of the teachers’ needs, in other words, a technology proficient educator may require different professional enrichment to a beginner. This is further illustrated through the social constructivist lens as training should consider the participants’ distinct knowledge, skills, and beliefs. In other words, a teacher who is comfortable at not only using technology but at using it within the pedagogical context may have less frequent enrichment, and this supports the notion that CPD provision is geared towards the needs of a teacher rather than school performance tables.

Interestingly, during the U.K. lockdown and period of remote learning, teachers were often receiving the similar less frequent and late CPD on teaching on the new platforms. This was
particularly interesting as with an increased usage and focus on technology, it may be assumed that CPD models were adapted. A common example that teachers raised is that when the school decided on the platform to conduct remote sessions, such as Teams, Seesaw or Classroom, there was an expectation that they possess the prior knowledge required to successfully teach with them. Although there is a universal problem in finding sufficient time for CPD, Bubb and Earley (2013) argue schools in particular certainly do not make the best use of what is available. Essentially, this type of training is seen as less desirable than others (Day 1999), perhaps due to the complexity of TEL. Some teachers have argued that this may be the result of requirements from Ofsted that essentially shape how schools in the U.K. are administered. Currently, Ofsted do not assess TEL CPD. Furthermore, there remains an absence of the word ‘technology’ in the Teachers’ standards which could explain how CPD is organised amongst the secondary phase.

Beyond the lack of significant CPD taking place, there appears to be a focus on technical knowledge in favour of the perhaps more relevant relationship technology possesses in pedagogy. An understanding of how technology knowledge relates to both content knowledge and pedagogical knowledge will transform viewpoints from ‘how do I use it’ and ‘what is this?’ towards the ‘how do I teach with this’ perspective. It is revealed that the administrative element, for example booking iPads, instrument training and school policy on how to distribute, charge and maintain the technology in schools takes precedence over meaningful teaching and learning. Wang (2002) argues that teachers’ technological skills do not typically translate into effective use at a pedagogical level, and this supports Koehler’s (2006) TPACK framework. In other words, successfully using social media or an iPad at home does not necessarily result in good practice in the classroom. There are profound differences in the relationship and interactions between technological tools and specific pedagogical practices. In this instance,
the CPD effectively focusing on technological skills is disconnected from ‘methods courses’ and how technology can be effectively implemented into the classroom.

Additionally, there was no evidence that the technical CPD considered individual distinctions in participants, such as the complexity of personal, social, and professional factors. There was essentially a ‘one size fits all’ approach to professional development. The author argues that this is a consequence of policymakers’ ‘simplistic messages that TEL is representative of pedagogical best practice’ (Ingleby, Wilford and Hedges 2018). This has led to misinterpretations of social media and TEL and no necessary adjustments are made for how individuals associate with TEL and how they wish their students to interact with TEL; this was further illustrated during the lockdown. Transformative CPD may address some of these issues by allowing teachers opportunities that will impact their beliefs in technology, such as first-hand experience, where they can observe successful teaching with technology. Some participants described a ‘double dip’ method whereby teachers act as students whilst a learning technology expert leads the class as if they were the teachers. This ‘gold standard’ of practice is increasingly productive as opposed to simply admiring technology out of context (Koehler and Mishra 2008).

As technology moves quickly, educators must have an understanding of effective pedagogical strategies, rather than focusing on the technology itself. In this way, educators will be able to effectively adapt to changes that present themselves in the future. Furthermore, with consideration to societal components, it is fundamental that teachers are aware of how their teaching fits in with the bigger picture or wider context.

Finally, the ‘who’ is delivering particular training sessions is important as unsuitable training may consider CPD in the form of enhancing knowledge, rather than knowledge acquisition in the appropriate context. There are three contexts in which knowledge is acquired: 1) the academic context, 2) the institutional context, and 3) practice itself (Eraut 1994).
Therefore, staff who have simply adopted the knowledge acquisition without the adoption of the other skills may experience challenges. Throughout this study, when teachers described their CPD, there was primarily reference to three types of ‘instructors’. The first was the senior leadership team (SLT), and despite being experienced practitioners they are often overly focused on using technology for the purpose of Ofsted, with training centred around technology in the administrative domain. Rather than training on how to enhance learning and engagement, an approach of ‘how do we evidence that we have used technology for Ofsted’ was adopted. Moreover, the data revealed that on occasions, social media training was delivered from the pastoral or safeguarding team at schools. At times, this was the SLT, however, in large schools this could be via ‘middle leaders’. This was particularly interesting as it indicates that social media is viewed through the lens of safeguarding and digital footprints, and this form of technology is viewed with caution. Policy makers do not seem to engage with the wide range of social and professional benefits that social media can deliver, despite extensive accounts of teachers using it both in a personal and professional capacity. In this PhD, I argue that regardless of how social media is viewed, it is necessary that teachers and students alike are aware of the risks and benefits associated.

Additionally, ‘tech savvy’ teachers would adopt the role of ‘technology specialist’ from their own experience using technology and through teacher advocates. At times, the three roles listed above do not make clear links between pedagogy and social media, and subsequently pupils’ learning. Therefore, it is unsurprising that teachers do not feel that they are part of a rich professional learning community in a social media context. ‘Professional learning communities’ is a term coined by social constructivists who argue that social interactions with technological tools develops an understanding on how effective CPD can facilitate teaching and learning. There were only a few successful examples of training that focused on how technology can benefit the teacher as opposed to digital training, and these came from schools.
that used Google Classroom. Google for Education provides teachers with certification for demonstrating the advanced knowledge, skills and competencies needed to integrate digital tools. Furthermore, Google for Education Trainers are professionals who empower educators to use technology in the classroom through high quality training. Professional development delivered by certified trainers in technology and pedagogy has appeared to be successful in this study. Interestingly, the trainers were not external educators, rather teachers already working at the school, and they followed this route to benefit their training of staff. Seesaw was a popular social platform used during the pandemic, and they also provide certification and ‘badges’ for those who wish to foster technology and leadership skills.

With an absence of how technology skills can translate to practical use at a pedagogical level, teachers are not being trained with suitable and consistent models for teaching and learning. Furthermore, an invariant approach does not address the complexities of social, personal, and professional factors. Consequently, there is an indication that CPD is severely underdeveloped across the TEL domain.

Kennedy’s (2005) transformative CPD consists of the action research-based model or ‘communities of practice’ which involves teachers acting as researchers with a view to improving a problem, and the transformative model which is a notion that CPD is a means to support educational change and may combine multiple forms. Transformative CPD is a development of both transmission and transitional phases, and also leads to greater teacher autonomy over their professional learning. The flexibility of transformative development is the capacity to adopt multiple personal and professional identities, and this is a more inclusive and social process. The research findings do not evidence significant transformative CPD with gaps in developing teachers’ past experiences effectively. The training also appears to exclude a person-centred approach which has been identified as being a successful way of developing practitioner confidence in pedagogy (Lightfoot and Frost 2015). Training in this domain ought
to first recognise and then subsequently introduce transformative CPD to ensure teachers can realise new and profound ways of thinking about and understanding their pedagogical strategies for TEL and social platforms.

This model is also embraced in social constructivists’ research that reveals that collaborative practice is fundamentally embedded in effective CPD, and can be constructed through social dialogue, and social learning processes. Through Trowler’s lens, teachers are able to reflect and critique through observations and active experimentation above restrictive instructional methods that focuses on pastoral over pedagogical content. Schools may be limited in adopting transformative models within their TEL CPD scheduling, as it requires greater capacity. Kennedy (2005) argues that few models are transformative in nature, and this is predominantly the result of this process requiring greater time and effort.

5.3 Theme 2: Why the term TEL is problematic

The complications of TEL and the dilemma that is presented upon educational institutes is long-standing (as in Ingleby, Wilford and Hedges 2019; Selwyn 2018). There are practical limitations that have been discussed with rigor across the body of literature, nevertheless the general population have made considerable use of the digital age. Some technologies can increase inclusivity for learners and make content extensively accessible to ensure learning goes beyond the traditional ‘four walls of the classroom’ (Campbell 2015). Students require their learning experiences to be in a context closely related to the outside world i.e., with digital involvements. Therefore, teachers require prompt integration of advancements as with social media in their pedagogical strategies. This research evidenced significant misunderstandings around what TEL is and the potential benefits it can deliver to a classroom. However, there was mutual agreement that some technologies such as iPads may not necessarily be useful for classroom pedagogy due to some tasks merely replicating what happens at present. Whereas IWBs and personal computers are essential for the teaching role in the 21st century, some of
the teachers argued they would not be able to successfully do their job if IWBs were ‘down’ for a day, yet they could manage comfortably without iPads.

Although participants acknowledged the differences in the products, during discussions of ‘TEL’ and ‘technologies’, the reference point continuously defaulted to iPads. As an example, when asked how teachers have used technology during lockdown, most gave an example of iPads usage then and now. This contradiction is part of the discourse in TEL, whereby iPads are not seen as particularly useful and yet they are embedded in the terminology for technology in education, and this is perhaps linked to policy or advocacy in this area by school leaders or various neoliberal governments.

Moreover, when exploring the teachers’ relationship with TEL and social media, it is worthwhile trying to understand positive and negative historical examples of technology in education. Looking back may acknowledge issues and factors that may only be revealed with hindsight. More predominantly, technology in forms such as non-numeric, and computer assisted instruction were first explored in educational settings. Many technologies such as personal computers were first designed for teaching and learning, as well as research and administrative purposes (Selwyn 2018). IWBs do not have a purpose in the general population, however they too have been successfully used across schools and contribute largely to teaching and learning. SNS (Social Networking Services) is paradoxical in the sense whereby the general population have been using these platforms for circa 15 years. The significance of a piece of technology or online platforms used by the general population before educational settings ought not to be underestimated. Personal preconceptions about social media have certainly influenced how they are being or in most cases not being used optimally in U.K schools at secondary level.

With variations in the technology and software that is used across education, the term TEL may be seen as a generalisation that fails to fully distinguish the profound differences among
them. TEL has become a shorthand for ‘learning technologies’, ‘EdTech’, ‘e-learning’, and ‘technology tools’, and this thesis evidences that these terms are more commonly used than TEL. Grouping such distinctions results in teachers using iPads as reference points in discussions around social platforms. In other words, because iPads are viewed as not particularly useful, other technology advancements such as educational social media that is grouped under the identical term (TEL) struggle with disenfranchising from a preconception that includes little added value. Interestingly, technology enhanced learning does not describe what ‘learning’ actually is, evolving into another contentious point amongst the education literature. For example, is learning with technology an assimilation of ideas through practice and mastery with the facilitation of technology? Or does technology aim to transform teaching, learning and assessment through communication?

There are distinctions between using an iPad to complete word-based tasks that could have otherwise been completed using traditional materials such as pens and paper, and social media to expand the learning beyond the four walls through enhanced interaction, timeline and posts functionality, social worked based groups, and remote assessments. The Covid-19 pandemic and subsequent lockdowns highlighted the differences further. In this instance, the word-based task could still be completed on paper with technology merely facilitating the task. However, social platforms have allowed for task redesign, modification, and redefinition in potentially transformative ways.

Furthermore, the data described teachers’ struggle with CPD in this area, and this is also linked to the confusion around the pedagogical benefits a platform may deliver. For example, without understanding how technology is linked to pedagogy, CPD in this area becomes idle and disengaging through administrative uses. By treating each piece of technology with individualism, regarding their features and functions, and linking them to specific technological pedagogical strategies, this is a more practical application of technology to
pedagogy. This relates closely to Trowler’s (2008) socio-cultural theory and the notion that educators have complex interactions with resources and that these resources are essential for effective learning. Generalisations in this respect are irresponsible with regards to cultural, political, social and posthumanism complexities.

5.4 Theme 3: Lack of pedagogical thought in policy making

In the U.K., educational institutes are reliant on the state with few exceptions as in private schools or home schooling, albeit this is only a small percentage. In a way, the state has become increasingly interventionist through curricula control, national standards, and standardised assessments despite pushback from educators. There is a breakdown between policy makers and educationalists, and this is no more apparent than in discussions around 21st century learning and the use of technology. The governments have tended to have a remit of setting education policy and designing guidelines to deal with social challenges (Slakmon 2017). Both of these are reflected in the social media policy, attitudes, and values that some schools have adopted. This has been further emphasised by both Labour and Conservative governments consistently arguing that ‘technology is not a substitute for knowledge’ (gov.uk 2017).

These findings evidence policy conflicts in education and in particular throughout the pandemic. As an example, participants discussed that personal devices such as smart phones, tablets, iPods, and even smart watches were associated with heavy restrictions from the school. In other words, a complete ban on modern day technology that is embedded in pupils’ personal and social lives. As one teacher reflected, ‘phones are banned at our school because they have a history of being too distracting…we are not as bad as this school I know where phones have to be handed in at the start of the day then collected at the end…yes, that would be hard on the kids’. Junco et al. (2011) and Passey (2014) argue that such bans can enhance stress and anxiety in pupils, and this appears to be in conflict with a student-centred approach to learning.
Interestingly, when the pandemic worsened in the U.K., and schools were forced to work remotely, initiatives such as work through online social platforms, and mobile apps were encouraged as a way to continue teaching and learning. Simultaneously where mobile phones were banned by schools, they were sought to be actively used as well. In this instance, school policy was constructed through outdated misconceptions, attitudes, and beliefs. In a way, the lockdown brought remote learning and discussions around social learning technologies to the forefront of the education agenda, whereby schools could see the benefits they bring to learning to better inform policy. This PhD found that this process had already begun, with some schools adding and editing their policy on data plans for pupils, and device allocation. A typical example of the relationship between technology and pedagogy being oversimplified through policy is evidenced via leadership teams advocating technology such as iPads. This study reveals significant influence from leadership teams at school around the use of iPads in the classroom. One teacher explained that this was perhaps due to the funds used to purchase the new Apple devices, which can cost a considerable amount. Nevertheless, formal meetings or emails encouraging staff to use certain technologies contain characteristics of policy making. This links with complications in a CPD context whereby there is a failure to make sense about how tablets can be deployed to students to enhance teaching and learning. The consequence of this approach is that teachers provide students with tablets to use, however direct feedback, voting, viewing documents, quizzes and data entry tasks are completed outside the tablet (as revealed in the work of Wulfert 2012). Thus, technology integration has not become transformative, and in many cases is absent of enhancement however this may present a hinderance to teaching. This is not to assume that iPads are not worthwhile in classrooms, rather that without an IT infrastructure, professional development and training, and funding, its potential is not realised. When exploring historical examples of TEL, in reference to personal computers, Conte (1997, page 23) argues that ‘in many schools computers sit idle
much of the time or are used for passive learning routines rather than being used to cultivate higher order thinking skills like synthesis, analysis, and communication’. With regards to limited infrastructure, Turbill (2001) writes ‘One computer in a kindergarten classroom is about as useful as one container with three pencils when I have 27 children in a room’. In contrast, social media policy is not representative of what is taking place inside the classroom. As an example, some schools have banned social media, whilst teachers are using YouTube for demonstrations in classes such as chemistry and physics. In a pedagogical context, platforms such as YouTube are successful for multimedia classes and demonstrations with 89.26% of teachers using the Google product.

This theme has followed the study throughout the data collection process. In phase 1, participants began discussing how school policy was a challenging aspect associated with social media in the classroom. Moreover, the phase 3 results revealed the conflict in policy during lockdown. Based on the research from this study, I argue that policy makers are engaged with the end product, that is, pupils using technology such as iPads, without sufficient thought being offered to how to develop pedagogical processes effectively.

More precisely, during the lockdown and amidst the period of remote learning, schools chose social collaborative platforms to avoid a disruption to children’s education. This PhD research has discovered that Google Classroom, Microsoft Teams, or Seesaw are used frequently. Despite the select few, the U.K. market is over subscribed to multiple software that describe themselves as either LMS or VLEs. Similar to social media, students have the ability to collaborate with others whilst connecting with the instructor. As an example, phase 3 examined Seesaw which was a popular platform in schools.

Schools or trusts make decisions based on their financial situation, and/or functional requirements. Teachers commented that at times Seesaw was challenging to use to assess students’ work. In fact, one teacher argued that it is increasingly difficult to consider students
work on most of these platforms as ‘those who are really good at technology may appear to be doing better than those who do not’. This indicates that teachers are not comfortable with assessing pupils online, and with reference to the SAMR model, it may be due to assessments online being used as a simple substitute rather than an increasingly transformative way of working; and this is when tension occurs. However, in the context of policy and decision making, assessment for learning as well as other pedagogical strategies were not considered. Throughout this study, teachers made apparent that giving students instant feedback, scaffolding and live marking are all problems that occur in situations of online teaching. The oversight with this is perhaps reflective of the relationship policy makers have with education. The needs of the educators are less valued ahead of attractive soundbites of ‘we use technology here’. Scholars have well published recommendations which include co-production of technology and policy driven by educationalists rather than technologists (Laurillard 2008). This method would encourage the viewpoint of using technology to meet a challenge rather than searching for a problem (Crompton 2012). Furthermore, there remains limited analysis of the politics, economics, and ethics of digital technology in education (Selwyn and Facer 2013) as these tend to be the increasingly influential or driving factors than pedagogical needs.

In some instances, new policy was required for students who did not produce work and this behaviour for learning was different to that in the classroom. Most schools adapted this well. Although, not included in this data as a policy per se, some teachers mentioned that they were charged with allocating technologies and data packages to students who most needed it. Overall, schools performed well in ensuring pupils had some access to learning during this difficult time.

5.5 Theme 4: Distinguishing the personal and professional in social media

There is evidence that social media can transform the delivery of learning by breaking down traditional hierarchies in terms of society and global geography (Lewis 2017). Learners from
around the world can engage with curricula at any place and any time. This has accelerated debates on how social media platforms can be best put to use in a teaching and learning context (Lewis 2017; Juno et al. 2011; Junco, Elvansky and Heiberger 2013). Furthermore, the future workforce may be impacted in detrimental ways if schools omit social media skills and competencies from their programmes. Realistically, social media as an educational resource can only benefit pupils at secondary level and above.

Much of this derives from the COPPA law which states that the minimum age for using social networking sites in the U.K is 13 years, but also from the education and psychology literature. Although policy may have an age limit of 13 years, the psychologist Gwenn O’Keeffe (2011) argues that logic and sophistication reasoning does not ‘kick in’ until later in life, subsequently a child may not realise that a post or comment is inappropriate. At secondary level, pupils broaden their social connections, and studies have shown that they consider social media fun, stimulating and that this helps build relationships during digital activities (Longfield 2018). Although, less published, however, an area that is becoming increasingly valuable is the benefits that social media can bring in terms of inclusivity. Students who are marginalised by disability, migration or sexuality are introduced to a broader selection of peers, thus benefitting their social well-being. The phase 1 data in this study confirms that teachers are aware of the benefits of social media in a pedagogical sense. The most popular platform was YouTube, and most important aspect of social media in pedagogy was online multimedia classes, thus there are certainly links beginning to be made. Not all pedagogical tasks were seen as being critical with regards to social media, as with assessment for learning, and tests/exams that were viewed as being least significant. Perhaps this indicates a disconnect in the broader sense from assessment strategies taking place across schools in the U.K. In phase 2 and phase 3, some of the highest pressing concerns around social media were established as key research themes. One of these significant themes is the tension between using social media in personal ways
compared with a professional capacity. In essence, teachers realised the benefits of contributing to a community of practice or social network on platforms such as Twitter. There are benefits of sharing resources for free and being a member of the discourse as part of professional development. Although some teachers found Twitter to be a rather hostile place to share ideas, it remained the most popular social networking platform within this group of research participants.

Nevertheless, teaching and learning in their professional capacity through platforms such as Facebook and Twitter were confidently rejected by educators. Many thought that there ought to be a separate and additional regulated platform for this. Researchers have been blessed with both qualitative and quantitative data generated through the lockdown. Most predominantly, the ‘social’ learning environments that have been welcomed and those that have been rejected have been revealed. Furthermore, this period allowed educators to express their opinions on the types of functionalities that they found useful and benefitted them in a pedagogical sense. The present research identified that Seesaw had functionality similar to Facebook with a timeline and ability to write posts. Students were familiar with this concept and grasp using it quite well. When students post on the timeline, it must be approved by the teacher beforehand. This prevented ‘spam’ and ensured quality posts. This links to earlier findings that teachers wanted an increasingly regulated platform to teach on. Phase 3 explored this research theme further and teachers discussed how Seesaw dealt with cyberbullying, which was a major concern by the school and is a well-publicised drawback of learning through social platforms. In this instance, parents were given access to the students’ work, and this limited the amount of non-appropriate content children generated. This functionality must not be underestimated in its value as the respondents praised this aspect of the technology ahead of other features and benefits. At the start of the study to screen participants, educators were asked if they use social media in their teaching, and in those who answered ‘no’, cyberbullying and the idea of it doing
‘more harm than good’ in mental health discussions ranked high. Much of the literature argues that social media risks cyberbullying with support from large organisations such as NSPCC, and this negative association is problematic. In fact, a study by Jardine (2020) found that social media ‘abuse’ has been reducing for the past 2 years, and this is perhaps a result of an enhanced awareness around mental health, and a greater understanding of digital footprints and the permanency of writing online. The term ‘abuse’ was described vaguely in Jardine (2020), nonetheless, it makes social media a ‘safer’ place to learn.

Essentially, there are platforms for the use of networking with colleagues and other educators including Twitter, and places to learn, in other words Seesaw and Google Classroom. These distinctions are important, and they reveal part of the complexity of technology and pedagogy.

5.6 A framework describing the main themes from this study

Throughout this triangulation approach whereby literature supported methodologies across qualitative and quantitative work, key themes have been firmly established. It is these themes that give precedence to using social media to transform pedagogy in meaningful ways. The SAMR model describes the application of technology to substitute and augment specific tasks. These are viewed as an ‘enhancement’ to a particular activity with limited tension, however, this study does evidence tension occurring at this stage. The simple substitution of a task that is subsequently completed using iPads is not revealing innovative pedagogy. Whilst the SAMR model outlines the modification and redefinition of pedagogical tasks through technological transformative pedagogy with technology is nonetheless a challenge, as it is within this stage that teachers can benefit from technology by creating new tasks that were previously inconceivable. Moreover, it is argued that transformative technologies can enhance emotional well-being by producing positive changes in the human technological experience. The
framework in figure 14 illustrates this study’s key themes whilst making links to transforming pedagogy to enhance understandings of using technology.
Figure 14. A framework describing the main themes from this study.
SNS along with other TEL products can be successfully incorporated into pedagogical practice by adopting the above framework. This framework summarizes the key themes of the study entitled ‘An exploration into the pedagogical benefits of using social media: can educators incorporate social media into pedagogy successfully?’. The framework describes four main stages or decisions that educators must make in order to successfully integrate social media into their pedagogy. These stages also hold significance in broader discussions of education technology as the themes have emerged using TEL models. The first is the establishing of goals, and this is the point where professionals will explore their primary objectives to using social media in this context. An educator may set meaningful social goals, and this may range from enhanced interaction with a resource into increasingly deeper learning through assessment. In the phase 1 results, teachers agreed that social media can be a tool that enhances engagement and improves the achievement of learning in the classroom (see figure 12). Therefore, the goals that are associated with engagement and learning are as relevant as the networking objectives that may be set when communicating with colleagues or industry leaders. In order to ensure that the goals are increasingly specific, the audience ought to be identified early in any education technology strategy. This is primarily because there are distinct differences in the types of users, and this has been reflected within this study. As an example, many participants engage with colleagues and educators from different establishments on platforms such as Twitter. The benefits of this were explored throughout phase 2 of the data collection whereby participants described the importance of having a social community where professional ideas could be shared. The study also evidences that different audiences reflect different goals, and it is these distinctions that ought to be considered during any planning of pedagogical tasks. The significance of considering audiences go beyond a limited social media view and this has implications on a broader TEL agenda, as with access and assistive technologies. Weible (2018) draws upon the importance of learners requiring
different tools, as ‘assistive technology alone will never guarantee access for people with disabilities because tools like websites, software such as those used for eRecruiting, they really must be designed with accessibility in mind for people to actually be able to use them’. In other words, there are cases where particular technologies are more suited to some learners than others, and it is the educator that must consider this when setting educational goals and objectives.

Once specific goals that include the intended audience have been identified, the educator must make decisions around the most suitable and appropriate technology to use. This study found that YouTube was the most popular SNS to use with pupils at the secondary level, however Twitter was increasingly popular in developing a community to share ideas and resources. Twitter empowers individuals to engage with fellow educators from around the world, breaking down traditional barriers such as global geography and societal hierarchies (Lewis 2017). The role of a platform such as Twitter has accelerated debates on how it can be best used to promote teaching and learning, and this is therefore, significant (Lewis 2017; Marich 2016; McKay et al. 2014; Juno et al. 2011; Junco, Elvansky and Heiberger 2013). There are other technologies that may be most appropriately used with students that have a disability (see Weible 2018 accessibility and assistive technology distinctions) Social media platforms and other technological advancements that are popular with the general population would generally be considered ‘personal’ in this framework. The rationale for this was listening to how teachers described the potential of using social media with their students. Teachers were primarily concerned with their online safety and were resentful of the prospect of even some of their personal details being shared with students.

Professional platforms are online platforms that have been specifically designed for the purpose of teaching and learning; examples include Google Classroom and Seesaw. Teachers welcomed the use of these types of social platforms for their programmes. Beyond social
media, there are other technologies that have been explicitly designed for learning, as with IWBs, LMS, and VLEs. The advantage of informed practice through educational agendas is the inclusion of the functionality intended for teaching and learning, and this has the potential to become more inclusive. Teachers were pleased with some of the additional functionality they had such as the ability to include parents as a safety-net for cyberbullying, the ability to approve posts, and easily breaking out into working groups online. Some platforms that the general population use have some of the above features, however they are limited as it differentiates from their primary goal of ‘building a social community for us all’ (Zuckerberg 2017). Outside of education or social work, there is no need to give access to your parents on your technological devices, for example.

Phase 3 indicated that there were essentially places where adults meet online, in other words, Twitter and Facebook, and places where children do is the same, in other words via TikTok and Snapchat. Marketing data also supports this, as eMarketer (2018) reported that in the age bracket up to 24 years of age, 90.5% use Snapchat, whereas only 46.9% use Twitter. When compared to this study, 77.04% use Twitter which evidences the importance of establishing audiences and selecting an appropriate social platform or technology. The importance of establishing an alternative educational specific platform for teaching and learning is no more apparent than in this study. Social media in the personal and the professional ought to be distinguished.

The notable exception is YouTube where teachers use this form of technology to search for demonstrations of science experiments. YouTube is a video streaming service owned by Google with over 2 billion users and content videos. The platform’s primary source of revenue is advertising, making it a global online video giant albeit with concerns around what adverts will be shown at the time of streaming to students. Within education, there does not appear to be a comparable platform that can provide significant content at a free cost. Some educators
referenced ClickView; however, its business model is reliant on schools’ subscription charges, and it does not contain the million hours of videos that are uploaded every day. In other words, YouTube is free to use, does not contain personal details about the teacher, and links to pedagogy increasingly more than any commercial competitor. I argue that this is not centralised to social media and does have meaningful implications across the wider TEL spectrum, as with personal computers and tablets.

From therein, the educator must make best use of their ‘assets’. Assets is a term that is traditionally associated with business and marketing terminology; however, the definition is broad in the sense of describing a ‘resource’ or something that is of ‘value to an individual (Gupta and Lehmann 2003). Additionally, assets as a term has been used in studies involving young people and society (Scales et al. 1999). Development assets are used to explore the importance of schools, support environments and values. In this context, professional development, school policy and consistent use of terminology would be of extreme value to the educator through a foundational sense of empowerment, purpose, worth and promise. The framework’s assets are consistent with the study’s key themes and these have been discussed in this chapter. The framework also highlights that these are ‘external’ or ‘instructional led’. This is not to suggest that teachers are not proactively involved in the process of developing transformative CPD, or changing culture within schools, rather that responsibility ought to lay with the institute. It would be unfair to expect a teacher to use social media or mobile phones in their teaching if school policy does not permit it.

Similarly, it is the school’s responsibility to provide professional development that is valued by teachers, including a focus on pedagogical strategies that links to technology over the technology itself. Many teachers in this study were not involved in the planning of CPD in TEL and this responsibility rests with the SLT. This study consisted of data collection in secondary settings and thus, assets have been relayed with reference to these themes.
Nevertheless, teachers may look beyond the three assets presented in this framework and at alternative opportunities the organisation offers.

This study has explored the reasons why CPD in TEL is underdeveloped, hence the importance of transformative CPD, that is a combination of practices that centre around educational change (Kennedy 2005). Transformative CPD addresses issues around communities of practice and considers the relationship technology has with content and pedagogy (Koehler, Mishra and Yahya 2007; Mishra and Koehler 2006). It can be argued that training that is highly appreciative of ‘how’ social media or other TEL can be used in pedagogical purposes through ‘double dip’ methods or others that consider it in the pedagogical context is a valuable asset for a teacher. Additionally, I have included terminology as this was one of the study’s central themes. In essence, the term TEL may be problematic as generalisations do not consider personal, social, or cultural complexities. It can be argued that this is overly generalising social media as a tool for teaching with other technology such as iPads, and that this is generating tension in educational communities. Being an expert in using iPads is not the same as using social media effectively, and it can be argued that if schools and school leaders recognise the complications around generalising terms such as TEL, an increasingly productive pedagogical environment can be developed.

In general, teachers are responsible for initiating, planning and executing pedagogical tasks that involve technology, thus, it is crucial that they are part of the phase that can be described as developing meaningful pedagogical ‘activities’. At this point, teachers must consider how they can transform pedagogy in meaningful ways using technology. Tang and Hew’s (2017) framework on the meaningful incorporation of social media into pedagogy includes categories such as representation, communication, collaboration, administration, reflection and assessment. This framework distinguishes between those that are external and instructional led and those that are internal, and teacher led. The purpose of this is to highlight the assets or
resources that teachers have autonomy over, whilst illustrating actions policy makers ought to consider.

In contrast, Tang and Hew’s (2017) framework does not consider the importance of goals, domains, CPD or policy. There is also limited distinctions between those categories that are pedagogical led and those that are concerned with other parts of teaching and learning, in addition to rejecting ideas of stages/prerequisites. Nevertheless, the inclusion of collaboration, communication, and assessment as ways to transform pedagogy were themes that arose throughout all phases of data collection, and thus, Tang and Hew’s (2017) framework has inspired this final part.

Collaborating with peers extends to discussions to ensure students remain informed; it is heavily characterized by constructivist approaches and echoed in principles of behaviourism (Piner 2014). Participation through collaboration can provide ownership of an individual’s learning (see Trowler 2008). Collaboration and teamwork are joint engagements that students operate in; hence, numerous studies have explored collaboration through online platforms and digital technologies (Kagan 1994; Luckin 2010; Bracken and Lombard 2004). Moreover, collaboration is evident amongst teachers working in TEL to generate further inclusivity or productive working groups (Bracken and Lombard 2004). Collaborating by creating a social community was viewed as the second most crucial aspect by teachers (see figure 10), and this remains one of the primary purposes of using social media to ensure that learning goes ‘beyond the traditional four walls of the classroom’. This was evidenced throughout the global pandemic where teachers were tasked with engaging students via remote settings. Platforms such as Google Classroom, and Seesaw allowed for collaborating and continuation of study under unique circumstances.

Furthermore, teachers expressed their concern that assessment for learning was rarely considered when platforms were chosen ahead of the U.K. national lockdown. Teachers
described the importance of being able to ‘live’ mark, as well as quickly yet accurately providing feedback on tasks. Hence, the significance of including assessment as part of pedagogy. Interestingly, in phase 1 of the research, the teachers made distinctions between assignments and pedagogy, however, this was further explored in the subsequent phases where teachers gave examples of failures with regards to assessment for learning in technology. This was possibly because the teachers associate terms such as ‘exams’ or ‘assignments’ with Ofsted. In fact, continuous and live assessing of students holds much pedagogical value. As described by the teachers, it is moderately ‘easy’ for teachers in the classroom to assess as they are able to walk around, speak with the students, and view formative assessment as it is happening. It seems that tension can occur when the assessments are moved online or integrated with technology, and with reference to the SAMR model, it is the equivalent assessments that are directly substituted or augmented online that present complexities. Rather than having a culture of perpetuating the same ways of assessment, technology should be used to transform assessment. There were few examples of technology being used to transform assessments in this PhD work.

There is little thought on which technologies best suit assessment, and this is the professional responsibility of the school leaders. Unfortunately, despite the attempts being made to ensure that learning is not disrupted for the students, there were examples of schools that had overlooked important pedagogical considerations such as assessment. This finding has been discussed earlier in the chapter, and a prominent example can be seen with teachers who needed to maintain multiple tabs open whilst using multiple clicks to view a student’s work from one day to the next. This is significantly more disruptive than the same task completed without technology (i.e., with traditional books). Once again this reveals some of the challenges that exist in applying technology to pedagogy successfully.
Through the lens of Trowler’s (2008) socio-cultural theory, social interactions and communication are considered to be fundamental requirements for learning. Social dialogue whether generated online or face to face is at the heart of the everyday interaction of many modern-day individuals (Freberg and Kim 2018). In many ways by not acknowledging how students communicate in contemporary ways, there is a disconnect with the world of employment, as many employers require their workforce to be digitally aware and social media savvy. There are a wide range of communication strategies that are associated with social platforms, such as live chat, a chronological timeline, private groups, and reflective posts (The Economist 2021; Kacker and Perrigot 2016). Other technologies also allow for live updates or notifications to parents as with Dojos.

Similarly, these are features that the business world have adopted to enhance an increasingly modern customer relationship. It is these strategies that educators must consider in using social media as the importance of using the most appropriate method should not be underestimated.

In a study by Vasek and Hendricks (2016), it is revealed that communication between teachers and students resembles a ‘peer to peer’ relationship, and that there are both positive and negative implications of this pedagogical relationship. In this PhD, I have developed Vasek and Hendricks’ (2016) work by reflecting on the theory of social constructivism and Trowler’s (2008) socio-cultural theory, and this is referenced through ‘transformative CPD’ and example activities of communicating and collaborating. These values run throughout the framework, and it is particularly relevant due to the social elements of social media and social networking services. The concept that social interactions are important for learning links into ideas around communities for professional learning and communities of practice. Constructivism is underpinned in personalised learning and removed from the ‘one size fits all’ approach, and this has become increasingly popular in educational literature that is prominent throughout this
research (see Beres et al. 2012; Dorca et al. 2012; Kim and Lee 2013; Zhang et al. 2012). Social media along with other TEL products can certainly contribute to personalised learning through communication tools, individual working spaces, security, and learning management tools. When associated with CPD for teachers, the personalised approach is described in transformative models (Kennedy 2005). This study illuminates the extent to which VLEs, and other social platforms have been characterised by constructivist approaches so that their primary use is to collaborate, extend discussions, and keep students informed. These characteristics are echoed in principles of constructivism and behaviourism (Piner 2014). Furthermore, Trowler (2008) addressed issues of CPD and explored social interactions with tools to facilitate 21st century learning. Concepts around a rebalancing of social contexts in teaching and learning is present throughout this study, hence the relevance of the work of Trowler (2008). This value laden philosophy is embedded throughout goals, domains, assets, and activities, and thus should be adopted in social media in pedagogical strategies and frameworks.

This framework has been developed to not only provide some insight into some of the most complex aspects of adopting social media in pedagogical tasks, but challenges in TEL generally. Its structure has grown throughout the data collection phases and has been generated from the key themes that arose in this study.

It is a development of previous pedagogical frameworks such as Tang and Hew (2017), as well as in the work of Kennedy’s (2005;2014). Kennedy (2005) argues that CPD ought to generate transformative professional development, and this also links to Trowler’s (2008) socio-cultural theory. In other words, the key findings from this triangulation approach are best presented in the structure described in Figure 14.

5.7 Summary of research aims
The present study consisted of the following research aims and objectives: 1) examine the current relationship between social networking sites and pedagogy, 2) distinguish factors that influence teacher engagement with social networking sites in their pedagogical practice, 3) determine, using a mixed methods approach, whether or not social media engages students and enhances academic performance and the degree of which this is compared with traditional teaching methods, and 4) design a framework for teachers to follow when implementing social media strategies in the classroom.

The relationship between social networking sites and pedagogy has drawn particular interest during the U.K. lockdown, nevertheless, some of the complications are long standing. Most comparisons have been drawn in relation to how social media engages with the wider population, whether it is marketing, business relations or communication. Regardless of the concerns social media in society may present, it remains at the heart of the modern-day individual. Education has always appeared to be uncomfortable with social media, and this is despite the workforce demanding that their employees are digitally proficient and social media savvy (Fox 2013). Children are unable to use social media until the age of 13 years, and it would be inaccurate to suggest the COPPA has not influenced usage in schools. Concerns from the general population and in this instance parents around the effects of social media on their children have contributed to a decreasing albeit negative perspective. Perhaps headlines associating cyberbullying, sexting, and depression with social media (BBC 2012) over benefits such as inclusiveness, enhanced self-efficacy and development of leadership qualities has been problematic (Housheh, Borycki and Kushniruk 2014; McLaughlin and Sillence, 2018). Furthermore, even at the age of 13 years, psychologists have remained persuasive in their arguments that ‘social reasoning’, in other words, not knowing what is and isn’t appropriate online doesn’t ‘kick in’ until later in life (O’Keefe 2011). The literature is clear about how schools approach social media dilemmas and this is through pastoral care. In other words,
rather than focusing on using social media in their pedagogy, teachers were educating pupils on digital citizenship, online safety, and how to become empowered online (Gonzales 2017). Similar themes were found in this study when exploring the content of CPD. The literature also suggests that there is a hesitancy around schools using social media to engage parents either through Facebook pages, or Whatsapp groups. Most teachers described that their school did not have a social media group or interaction with parents through these platforms yet were positive about the idea of using contemporary communication methods. There are distinct differences between higher education’s relationship with technology and social media, and those at the secondary school level on which this study is based. This is perhaps due to the benefits of social media aligning with university goals of expanding accessibility to learning beyond the traditional four walls. However, the digitally demanding, and increasingly ‘digitally native’ students themselves play an important role in influencing this relationship. Perhaps the age of the students has contributed to how HEI have adopted technology, in other words, they are primarily working with adults and not vulnerable children. In schools working with pupils in the secondary phase, there are complications and additional considerations.

Teacher engagement with social networking sites in their practice ought to be considered as factors that go beyond the institutional relationship with TEL. In a paradoxical instance, teachers are frequent users of social media in their personal lives. In 2020, Alexa ranked YouTube #2, Facebook #3, Twitter #12, and Instagram #13 as the most popular sites in the world. Facebook has over 2 billion users from around the world (Fatehkia, Kashyap, and Weber 2022). This PhD study has found that over 92% of participants use social media in their personal capacity. There are three primary challenges that teachers face in applying technology to pedagogy, and they include personal, social, and professional factors. Whilst it seems to be unlikely that teachers would use tools that are banned in school, even in instances where schools have a flexible policy on social media and technology, teachers appear to be uncertain
about how to teach with this medium. This is strongly associated with CPD in this area being undeveloped, with much of the training focusing on administrative uses over transformative coaching.

Furthermore, there must be thought given to teachers and their prior experience teaching with this form of technology. There have been unsuccessful cases where the ‘technical expert’, or pastoral leaders are instructing the use of social media or TEL. Rather it should remain with the pedagogical experts, with a focus being how technology can transform tasks in meaningful ways, rather than simply substituting traditional pedagogy by using technology (as with basic and limited assessments completed online). Moreover, social media has complexities that are significantly different to using other forms of TEL, such as iPads, and these concerns are well represented at a societal level.

Nevertheless, there have been successful examples given in the literature that demonstrate the potential of a positive relationship between teachers and social media (see Gao et al. 2017; Landson et al. 2015; Vasek and Hendricks 2016; Tang and Hew 2017). The relationship between teachers and social media is complex, however, there are well-defined factors that influence this relationship in positive ways.

The present study has adopted a mixed method model where surveys were conducted, interviews undertaken, and then further examined in follow up interviews in a three-phase data collection process. Ahead of the first phase of the research, the most relevant social media platforms were identified, for example, ‘multimedia demonstrations using…YouTube’. During the research, the teachers revealed that social media can enhance pupils’ engagement and these research findings are supported by the published research literature in this area. Social media as a tool to enhance engagement at undergraduate level has been heavily explored (as in McKay et al. 2014; Landson et al. 2015). However, this has been primarily in the HE domain with little resource spent on exploring teachers’ perceptions in secondary schools. The U.K. lockdown in
a way forced institutions to investigate the features and benefits of particular software and social platforms. Whilst there were examples of schools doing this well, many did not. In many instances, teachers were beginning to understand why their platform worked so well i.e., Google Classroom, or interestingly, why it didn’t work well and how this could be developed to enhance learning and engagement. Teachers, for example, quickly saw the benefit of being able to communicate and collaborate with pupils from a remote location. Although no comparison data was available at the time, anecdotal evidence suggests that children were still learning and engaging with the curricula despite the challenges the pandemic brought. One teacher commented on the situation and said that despite all of the students working below their predicated grades from Y7, they were working above the new amended ‘predicted grades’. At the start of this research, there were questions in the literature about ‘how’ this concept may work. Livingstone and Brake (2013) queried whether or not social media can be integrated successfully in educational settings and how the success of this integration could possibly be measured. The period of remote learning has certainly expediated this, and the data in this PhD study shows that teachers are becoming increasingly aware of the advantages and disadvantages in terms of learning and engagement. However, this was not limited to social media, and a wider digital agenda was explored through the pandemic.

Although, teachers are encouraged to share best practices with departmental colleagues, at times, teachers may not be the most successful professionals at doing this. Teachers have long been used to working autonomously and in isolation, which can impede interaction (Silins and Mulford 2002) and consequently prevents teachers learning from each other naturally. This interaction can always lead to negative criticisms among peers as opposed to constructive criticism (as revealed in Runhaar and Sanders 2015). This finding is evident in phase 2 of the data collection when teachers were questioned about their usage of certain technology platforms. Twitter was mentioned as being beneficial as it was perceived to be a site where
educators could share resources and ideas from around the world for free. Nevertheless, many teachers argued that Twitter has become quite negative and there is a sense that teachers just criticise others on this platform. There was also an acknowledgment that this wasn’t limited to the teaching profession, however, teachers certainly were not comfortable about using this form of technology for pedagogy. The benefits of sharing best practice in a safe environment is well publicised; and as teachers share best practice, they naturally become empowered, and the skill level of that teacher increases (Runhaar and Sanders 2015). Furthermore, TEL and social media hold the potential for innovative learning, however the research in the PhD reveals that teachers require effective training on how to use social media effectively in their pedagogy. Moreover, Fox (2013) argues that teachers are not using social media in their classrooms due to the ambiguity of how to use this form of technology effectively. In this PhD thesis, I argue that social media strategies may support teachers in their socio-cultural approach to learning, however there are as discussed, a number of significant challenges in realising this agenda.
CHAPTER 6- CONCLUSION

The final chapter concludes this doctoral thesis, by summarising theoretical perspectives that have unpinned the study, and discussing the implications and limitations of my work. Initially, I begin by justifying the rationale for this study by highlighting the gaps in the TEL literature. This also includes reflecting on the strengths and weaknesses of the methodological approach that was undertaken. There are a number of new contributions to knowledge that have been established in this work and these will be illustrated via the study’s key themes. The limitations of the study are also discussed and linked to restrictions that have emerged during the Covid-19 pandemic. The chapter concludes with recommendations for future research, and a reflection on how I have developed as a social science researcher through this doctoral journey.

6.1 Summary of the study

This PhD research attempted to explore whether social media can be incorporated into pedagogy successfully. Although there are specific links to social media, the study’s key themes have implications and relevance across TEL generally. Therefore, in light of this and with the particular rise of e-learning during the U.K. lockdown, there is significance beyond social media in pedagogy, as with technology and education. The research aims and objectives were to: 1) examine the current relationship between social networking sites and pedagogy, 2) distinguish factors that influence teacher engagement with social networking sites in their pedagogical practice, 3) determine, using a mixed methods approach, whether or not social media engages students and enhances academic performance and the degree of which this is compared with traditional teaching methods, and 4) design a framework for teachers to follow when implementing social media strategies in the classroom. Using a three-phase data collection process, whereby surveys were conducted in phase 1, interviews undertaken in phase
2, and then further examined at follow up interviews in phase 3, I have identified four key themes which are central to this thesis.

The first theme that emerged is that CPD is underdeveloped across most U.K. schools with regards to technology. The findings also reveal the need for more thought to be given to social media professional development as many teachers use some form of social media for personal uses, whilst additionally using it in the classroom, for example, as with YouTube. When CPD did take place the administration of the technologies took precedence over meaningful pedagogical strategies, signifying that teachers were aware of how to book iPads but unskilled on how to transform teaching with them. There are distinctions between social media and other forms of TEL, and this becomes heightened in CPD sessions. As an example, schools welcomed iPads and even encouraged teachers to use them, whereas schools pushed messages of caution and discussed cyberbullying, and digital footprints in social media sessions. Thus, the potential of social media has not yet been realised in schools.

An increasingly transformative approach to technology may involve further collaboration between schools, policy makers and technology companies. I argue that increased collaboration between these agencies and agents is likely to result in products that are designed specifically for education and pedagogical purposes. The U.K. government have attempted to address this through the TCoP (2021), which encourages schools to be proactive rather than reactive in their policy making, and for products to be designed specifically for learners (Burton et al. 2021). A community of practice between technology companies and educators aims to use pedagogical expertise in innovation. This study illuminates the disconnect between technology and successful professional development, thus, the community of practice may address some of these concerns. Barton and Brown (2021) argue that educators are in a paradox whereby they have hundreds of choices of technologies to choose from, yet too few aim to do right by the
learner. This means that educators often push technology that can be ‘hit or miss’ in their pedagogical application.

Transformative CPD is flexible and advocates for a community of practice as it is a more inclusive and enables a social process of professional development. This type of professional development can lead to greater teacher autonomy, which was a prevalent theme in the literature (Kennedy 2005; 2014). The CPD literature also showed support for this social constructivist approach to teaching and learning (Darling-Hammond et al. 2009; O’Sullivan 2007). Professional learning communities are capable of transforming teaching and learning for both the student and educator (Lieberman and Miller 2008), whilst social interactions with ‘tools’ supports understanding how effective CPD can facilitate teaching and learning in the 21st century (Trowler 2008).

The second theme primarily discussed the complications with terminology and in particular how the term TEL is problematic. In fact, teachers may be unaware of the term TEL and had preferences for other terms such as ‘EdTech’ and ‘learning technology’, subsequently fuelling confusion in this area. The impact of this ought not to be underestimated, with many teachers defaulting to iPads in discussions around technology in education. This became challenging as many teachers did not find iPads particularly useful for teaching and learning, rather viewing them as an administrative tool or something that did not transform the way they teach. Groupings of these terms provide scepticism around new technologies and in particular social media. It is irresponsible to suggest that all technologies can enhance or transform teaching in the same meaningful way.

Nevertheless, teachers were aware of some distinctions, arguing that IWBs are invaluable, and teaching would be disrupted if they did not work for a single day, whereas teaching and learning could continue if iPads were not working. This all evidences complications with regards to TEL in secondary schools, and there appears to be an absence of thought to cultural,
material, political, social and posthumanism complexities of each technology. In other words, it has been simplified and this causes challenges in embedding technology to pedagogy successfully. This is not to say that educators must learn how to teach with each type of technology. As technology moves forward quickly, this becomes likewise irresponsible, rather strong pedagogical strategies relating to TEL must be the focus, and in this way, educators are able to adapt to the technological changes that come their way. This approach to teaching and learning may reduce the importance of well thought out integrations and deployments of technology as teachers prioritise pedagogy over learning the technology. Traditionally, implementation plans may involve significant disruption to teaching and learning as with downtime, migrations, and training schedules for teachers. Regardless of the technology, teachers should be able to continue with their teaching and learning activities as they have a foundation of learned pedagogical strategies. This theme summarizes education’s approach to technology, simply grouping them together without thought about how that particular technology can be related to pedagogy.

I argue that some of this links back to CPD focusing on the administrative parts of new technology over the pedagogical benefits. When CPD evolves into a community of practice that further considers teachers and pedagogy, there will be a shift from administrative uses to transformative uses in pedagogy. Some schools evidenced this during the pandemic as they had adopted Google for Education’s solution. I also argue that when schools begin to distinguish differences between social media and other forms of technology, in other words, transforming compared with substituting tasks, scepticism around social media decreases. Furthermore, as technology companies co-design and develop education specific software, schools will begin to view potential limitations of a piece of technology through the lens of a designer. For example, if teachers are going to consult with tech companies, there may be a greater understanding why certain buttons and features are designed and located in that way.
Assessment for learning has presented challenges for teachers working online, however, some of this may be a result of how schools are graded and assessed themselves. Outside of technology, teachers have traditionally viewed assessment as almost separate to pedagogy due to significant focus on the final outcome rather than the process of learning, as with Ofsted and school league tables (Ward and Eden 2009; Berry 2021). This approach tends to present a clash in values and processes that involve technology. Social media along with other social learning platforms are characterised by their social constructivist approaches whereby their primary use is to collaborate, extend discussions and keep students informed. Currently, secondary schools put little emphasis on individual working spaces, communication tools, auditory, visual and tactile curation when designing assessments (Kurilovas et al. 2016). The virtual world presents more opportunities for evolving assessment beyond a simple quiz style online form that misses out the quality of interactions, communication among peers and levels of participation in a lesson. Thus, adapting how pupils are assessed both formally and informally using multidimensional tasks and the opportunities that technology may bring will reduce tension in this area.

Moreover, the third theme discussed the lack of thought in policy towards pedagogy and TEL. Interestingly, this theme began evolving during the second part of the phase 2 interviews and in the midst of the Covid-19 pandemic. I argue that the period of remote learning enabled educators to efficiently recall their experiences of TEL in relation to school policy. Educators argued that iPads were purchased by their school with no actual coherent plan justified why the school possessed them for teaching and learning. Teachers remain unsure how the iPads link to their day-to-day teaching activities, yet they are continuously encouraged by senior members of staff to use them. Commonly, teachers are using technologies such as iPads to substitute their administrative tasks rather than transform pedagogical activities. The literature argues that this is the case with Blackboard in HE too (Haythornthwaite 2016).
Some schools benefitted from good policy making during lockdown, such as plans to distribute iPads and personal computers to ensure that teaching and learning activities remain undisrupted. Additionally, there were positive examples of new policies such as thought to data plans and enhancing how a teacher could conduct remote sessions. Despite this, there was evidence that schools did not consider pedagogy in their decision-making process for selecting a social or learning platform to continue teaching and learning. As an example, many platforms that were used during the pandemic lacked the ability to ‘live mark’ and ‘scaffold’ work. Assessment for learning remains a challenging aspect of technology in education as it differs from measuring attainment in the classroom (Pesare 2015). Despite being expert practitioners, teachers were unable to get the overall picture of the student, and I argue that the casual approach to decision making in TEL ought to change. Additionally, the proposed community of practice that involves teachers and tech companies with general policy making may result in co-constructed policy that considers pedagogy. The pandemic highlighted that policy making influenced how teachers used certain technologies. Therefore, this social constructivist way of working may shape how educators interact with the technology they use for teaching and learning.

The fourth major theme is that there are distinctions between social media in the personal and professional domain. Educators were positive about developing a community of fellow education professionals on platforms such as Twitter, however, they were increasingly hesitant about interacting with students on these platforms. Teachers sought a further regulated and education specific social media-type platform to engage with pedagogy, and these come in the form of social platforms such as Seesaw or Google Classroom. The primary difference between these and Twitter is that the former have been developed specifically with education in mind, and at times through consultation with educators from around the globe. The benefits to a teacher was illustrated throughout the data. As an example, teachers welcome functionality
such as inviting parents to a student’s timeline as a way to combat concerns around cyberbullying. Teachers gave high praise to functionality that allowed permission to reject or accept posts before they appear on a student’s profile or timeline, as a way to prevent ‘spam’ and to keep it regulated. In other words, there are ‘places’ that educators use for networking and other professional activities, and ‘places’ where pedagogy can take place. This links closely to Weible’s (2018) work on how certain technology suits certain audiences, whilst it is important to consider access and assist learning. There are implications of this in the new Early Career Framework (ECF) that forms part of the new Early Career Teacher (ECT) induction. The new 2-year format will include workshop style sessions with new teachers sharing best practice, such as using YouTube for impactful science lessons. The introduction of ‘practice’ statements which draws upon research and expert accounts will specify the ‘how to’ which is significantly absent from social media and education practice. The applied or ‘how to’ is often an afterthought in CPD or policy making, therefore, I argue the introduction of the ECT practice statements are valuable in increasing confidence and understanding of using social media in the classroom. The practical guidance on how to use skills in the classroom will also help alleviate some of tension between social media in the personal compared with the professional. As an example, teachers may recognise that Twitter is primarily used for one aspect of networking that is different to how YouTube may be adopted in the classroom.

Moreover, I argue that teachers would benefit from this guidance, thus, schools should adopt a professional development expert who is able to advise on the profound differences between social media and iPads, for example. This format has worked well with ‘Google’ schools, whereby teachers earn qualifications delivered by Google that allows them to advise and educate teachers in their school. Google Certified Trainers are able to recommend certain Google products for specific pedagogical tasks that support teachers in their planning.
The pandemic has expedited the education agenda with regards to technology and many educators are looking forward to how technology can transform teaching and learning. Thus, these themes all highlight significant issues that have implications across the broader TEL spectrum. It would be unfair to criticise teachers for their role in social media’s current status in education as this lays in the hands of policy makers and school leaders.

6.2 Implications

The study’s four major themes illuminate the challenges involved with successfully embedding technology in education, and in particular social media. The relationship between educators and social media differs to that of educators with other technology such as iPads, in addition to the general population’s relationship with social media. The reasons why this is the case are particularly interesting and include a combination of policy such as COPPA and internal school policy. The literature suggests that HE has an alternative and increasingly positive relationship with TEL. There are lessons that secondary, and FE could learn from HE with regards to accessibility and expanding learning beyond the traditional four walls. The relationship between educators and social media is becoming increasingly relevant, as an example, many students are now expecting technology to be embedded in their learning experiences. In addition to good policy making, there are deficiencies in the CPD taking place across schools. As an example, many schools tend to focus on the administrative uses of a particular tool rather than pedagogical strategies to teach with it. I argue that CPD ought to consider how to use TEL with teaching practice through transformative development. Educators have a variety of prior experiences with technology in the classroom, furthermore, those with experience using technology for personal purposes may not necessarily have the skills to embed with pedagogy.

The relationship between social networking sites and pedagogy draws significant interest across the U.K. Some of this stimulus is due to a rise of remote learning and technology in
education from 2020 onwards. Schools tackle social media through pastoral sessions, in other words, digital footprints and cyberbullying. Yet, this study does evidence that there is an appetite from teachers to use social media further in their pedagogy. Most already use YouTube for demonstrations, and teachers would welcome school communication to parents via social platforms. This is not to say educating pupils on becoming empowered online should be scrapped, rather that there are additional benefits than could be utilised. In fact, many of the words of caution associated with social media comes from policy in this area. Acknowledging the benefits can then be discussed within internal staff training sessions. CPD for TEL is primarily focused on the administrative application of certain technologies, and this again, may only be possible through policy change.

Teachers have a profound relationship with social media, and in a sense a challenging one. On one hand, teachers regularly use technology in their personal lives (Lee, Yen and Hsiao 2014), however, this has little impact on how well they can teach with technology. Even more so, social media is unique in how it can transform teaching and learning beyond other tools that aim to substitute tasks. There is evidence of a positive relationship between teachers and social media (see Gao et al. 2017; Landson et al. 2015; Vasek and Hendricks 2016; Tang and Hew 2017). Much of the literature has explored HE’s use of technology; however, this study provides some of the insights across the secondary phase. One aspect of pedagogy that was not as well publicised are assessments, and this is because assessment at HE level is very different to what is occurring in secondary education. For instance, secondary teachers in this research appear to struggle to adapt to assessments online or with social integration as it differs significantly from their day-to-day work. Moreover, the teachers in the research sample are not able to capture start and end points, progression, live marking, scaffolding as easily with Classroom and Seesaw.
Alongside this finding, there were interesting research findings in relation to social media in the personal and the professional domains of the research participants. In essence, there are platforms for networking and platforms for pedagogy, and at first this would seem obvious, yet there are some anomalies as with YouTube. YouTube is a mainstream social media platform that is used inside and outside the classroom. In other instances, Twitter and Facebook may only be appropriate for schools to communicate with parents. Teachers had a preference for a regulated and education specific platform and there were additional features that supported their claim. It is important that teachers are involved in consultation and dialogue when choosing technologies to use. Weible (2018) describes the importance of access technologies, and the same concept applies to choosing a social media platform. It is not as simple as selecting random social networking sites to conduct a task with an absence of thought to decision making in this area. In general, groupings of technology and even social media have been somewhat problematic throughout this study. Social media has become popular with the general population before use in the classroom. Furthermore, the purpose of YouTube differs from Twitter, largely because they are different private enterprises. Education specific platforms such as Seesaw and Classroom were designed purely for education, and thus, they share a similar education agenda.

In other words, there are a range of factors that influence education’s relationship with social media, and the subsequent teacher relationship with technology. Many of these themes are mirrored as with CPD, personal and professional distinctions, and policy making. Teachers with experience of social media and other technological tools, may not be able to embed technology in their teaching due to these complexities (Lee, Yen and Hsiao 2014). Transformative CPD may be able to mediate and addresses some of these difficulties, however, this may require policy makers to adapt their approach to teaching with technology.

6.3 Review of the methodological approach
I acknowledge that there are limitations of any chosen the methodology, and this is revealed in many research studies. This study was underpinned by Trowler’s (2008) socio-cultural theory as this theory links to pedagogical approaches to teaching with technology tools, and the significance of the social media context. The theory argues that social interactions are important for knowledge construction (Bruning et al. 2004), and this emphasises the importance of the relationship between individuals and tools through social environments. The relevance is particularly useful in understanding the long-term impact of CPD as the lack of collaboration with fellow educators is often presented as a constraint in education studies. An alternative approach would be to view pedagogy and social media through the context of the individual. One of the limitations of the socio-cultural theory approach is that it may in fact underestimate the individual. As an example, the theory does not necessarily consider learners who may be particularly gifted or have an alternative personal understanding. In addition, this perspective does not reflect on the constraints in engagement, as learners with certain learning difficulties or SEN may not be able to take away the same meaning from a group interaction (Lui and Matthews 2005).

6.4 Limitations

6.4.1 Survey limitations

Initially, the author aimed to develop a survey using SmartSurvey, and a request was made to Teesside University to support the funding of this, however, this was rejected. SmartSurvey is an interactive survey maker used by organisations such as the NHS, Microsoft, Barclays, and Ikea, and allows for professional interfaces and mobile friendly answer types. Moreover, the features include the ability to insert icons on each question. It reasoned that these functionalities would have supported participants through visual exemplars, for example, a YouTube logo replacing the word ‘YouTube’ in standard arial font. Despite restrictions to branding, designing, answer types, and survey logic (i.e., if a participant answered Yes to
question 1, they automatically move to question 4), the survey was successful in achieving over 400 responses. I was aware that the Likert scales were not particularly mobile friendly, and this may have influenced responses. Indeed, some participants did stop or give up mid-way through the short survey. Nevertheless, the survey was forwarded to email addresses that contained the school domain, therefore, it was difficult to predict the quantity completed via mobile or tablet devices. SmartSurvey as well as other market leaders in this software allow reporting for the device that was used to complete the survey. Regardless, this was never part of the research scope so the impact on the overall study was minimal.

The survey remained open for 8 months, and this entailed multiple ‘drives’ whereby the author would market the survey to schools in stages. As an example, the first drive was successful and managed to obtain around 200 responses, however, engagement after this drive was lower, and at times the survey would be open for weeks without any participants responding. During the lockdown and period when schools were attempting to adapt to changes such as to remote learning following guidance from my supervisory team, I amended the text in the email that made links from the thesis to the relevance of events taking place in education at the time. This resulted in positive responses as more participants began taking part, however, this does raise reliability and validity concerns. Although engagement of the survey was high during the lockdown, participants may have been recalling experiences from the previous 2-6 months beyond their overall experience of technology in education. This was a probable scenario, and the interviews reaffirmed this as participants provided examples during the pandemic. It was understood that public opinion of technology in education had evolved during the lockdown, however, this was not necessarily a negative development. Teachers and school leaders alike were increasingly mindful of the challenges and benefits associated with technology in pedagogy.
Furthermore, I reached out to school administrators and headteachers through emails and phone calls to request that the survey email and link could be forwarded to their teachers. Purposeful sampling was adopted whereby teachers had to be working in the secondary phase with Qualified Teacher Status (QTS) and have over 1 year teaching experience; and this criterion excluded Newly Qualified Teachers (NQTs). Nevertheless, it was difficult to truly understand who was completing the survey. This limitation is associated with the chosen methods and the sample profile. To overcome this, on reflection, I could have included a screening question as a precaution if the survey was shared with a TA or NQT by mistake. Instead, this information was on the participant information sheet, however I do not view this as a significant shortcoming of the study.

Due to the nature of my participant recruitment, it is difficult to agree upon a definite figure for the survey response rate, however I was pleased to receive over 400 responses to the survey. This is particular pertinent because despite survey use increasing over recent years, response rates have been declining (Baruch 1999; Porter and Umback 2001; Van-Horn 2009). Lower response rates lead to multiple research problems, such as low precision, less statistical power, and potential bias. As an example, it is challenging to determine how many teachers actually saw a forwarded survey link. Researchers aim to attain a higher percentage of a response as this decreases the maximum variation. Cohen, Manion and Morrison (2018, p. 343) argue that a response rate of 10% may lead to variation of 5-95% which significantly impacts the reliability of the study, whereas a response rate of 100% lowers the maximum variation to 50%. Unfortunately, this data was not available for this study. To mediate this, however, I conducted Cronbach’s alpha testing to understand how reliable the instruments, and in particular the survey were. Cronbach’s alpha is reported a variance 0.71 using Konting et al. (2009) and George and Mallery (2003) I consider that the application of the Cronbach alpha scale positions was a strength of the survey.
Nonetheless, the survey relied on a self-reporting response, and this is considered in general to be a benefit compared with conducting face to face interviews (Dillman et al. 2014). In other words, participants were responsible for understanding and administering the questions themselves, and this may result in misunderstandings if the questions are in any way ambiguous. The challenge with online surveys is that respondents may answer in unintentional ways and to ensure that this challenge was lessened, I consulted with my supervisory team throughout the formulation of the survey questions. Furthermore, the study did involve mixed methods with data subsequently gathered from interviews and this proved to be useful in complementing the initial data that was gathered via the survey.

6.4.2 Interview limitations

The first interview was conducted face to face, whereas the subsequent interviews were conducted on various video conferencing platforms. The benefit of face-to-face interviews is that it allows the researcher more control over the real-time circumstances influencing the interviewee via real time (as opposed to online time) through visual and other sensory cues (for example, if the room becomes too hot, I can open the window to let in fresh air). Online interviews are more challenging, especially when participants choose to take part with the camera off. I did not make cameras a mandatory requirement for the interview, as I thought that non-visual methods may encourage participants to discuss sensitive issues such as criticisms of CPD in their workplace (Cohen, Manion and Morrison 2018). At times, when the cameras were switched on, the icon would convert to a thumbnail size whilst sharing screens which made identifying any cues increasingly challenging.

I noticed the impact of this when transcribing the interviews as certain phrases without additional cues became somewhat ambiguous, thus, video interviews were in a way slightly problematic for data analysis. Nevertheless, my limited experience as an early career researcher conducting interviews in this format perhaps contributed to the difficulty of working with
qualitative data without cues. To mediate this, I met-up regularly with my supervisory team via Teams during the data analysis stage and followed Braun and Clarke’s (2006) six phases for thematic analysis. Despite Covid-19 disrupting the previously planned interviews, the pandemic brought the digital agenda to the forefront of education policy and teaching practice, and overall was seen as increasingly beneficial for gathering richer data.

6.4.3 Researcher limitations

I am skilled at creating surveys using different software, and this is perhaps reflective of a high response rate of over 400 participants. Dillman et al. (2014) argue that participants are more likely to complete online surveys that are made attractive with graphics, fonts, and colours etc. However, surveys that are too sophisticated may present problematic technical deficiencies. I have maintained a considerable network of educators that allowed access to teachers across the South Yorkshire region, therefore it was decided with the supervisory team to target between 300-500 responses from the survey. Hence, the survey remained open until this number was achieved. There is much debate around the quantity of participants required to adequately explore a particular phenomenon through a survey in this way. There are multiple formulas that can recommend a sample size that would achieve a high confidence level of 95%, such as Oppenheim’s (1992) scale, Krejcie and Morgan (1970), Bartlett et al. (2001), and Borg and Gall’s (1979) formula for determining sample size. However, none of these were used even as a guide, partly due to the distinctions on research purpose, questions, design, size of total population, heterogeneity of the population, and scales used in the survey.

Although the surveys enabled the generation of descriptive statistics analysis via Microsoft Excel, the interviews did take a considerable time to transcribe, and searching for themes was time-consuming. Qualitative research has traditionally been criticised for lacking rigor and producing biased results, especially with the flexibility of applied thematic analysis. There are arguments within the literature too that claim that the researcher may know what they are
looking for when they are looking at text, and that this restricts how analytical and responsive these forms of research can be (Finfgeld-Connett 2014). Although it may be the case that the data analysis was confined to the researcher’s agenda rather than the other way around, this was mitigated due to the mixed methods approach within the research, and via consultations with the supervisory team, and having a second round of interviews.

In summary, the study relied on participants detailing numerous accounts of technology being used in education, for example TEL CPD training, and experiences using social media, and I think that Covid-19 helped in making the topics discussed during the interviews highly relevant to the present day. Despite the challenges to the study, I am confident that the mixed methods research in this PhD is credible and valid and makes a new contribution to knowledge in education.

6.5 Future research

I have argued that there are multiple challenges associated with integrating technology with pedagogy, and these include CPD, policy, terminology, and separating the personal and professional aspects of usage. Although the findings are in the context of social media, they hold relevance when discussing TEL as many of the challenges are reflected in the overall discourse. Throughout this thesis, there are a number of areas that would further explain TEL and the challenges with additional exploration.

There would be value in an enhanced understanding of how responsive schools are to change with regards to their professional development programmes. Some schools demonstrate that they are becoming more supportive of their teachers’ CPD requirements with respect to technology, such as training via Google for Education programmes. Nevertheless, this is not mainstream with some institutions bypassing this thought process.

Earlier in the study, I argued that schools are well placed in society to not only be educators of curricula, but social workers, nurses, psychologists, administrators, and activity
coordinators, amongst others. Therefore, there may be instances where pedagogy may not be viewed as the most significant influence behind school policy making decisions. As an example, training teachers to use a ‘mix, pair, share’ approach, which may be considered to be a low priority, compared to ensuring that the pupils have access to school meals at lunchtime.

In the light of this PhD, this particular issue was exemplified heavily during the lockdown, whereby in the period of remote learning, children who would otherwise have been provided with subsidised or free school meals were left without this provision. This quite elaborate instance certainly impacted on how schools approach and prioritise various societal challenges that link to education. I argue that there is little research that distinguishes these types of encounters and how they may impact the policy making process in a technological context. Hence, it is important to understand different agendas within education, and in exemplifying this point, ‘bullying’, for example, may be mediated with good technology policy, and this is closely associated to the school’s responsibility for student wellbeing. Moreover, during the lockdown, social media revealed to the nation that there were issues with school meals, and this may be an interesting platform to highlight further issues. It is interesting that the schools are using social media to get messages out to the parents and the public through Facebook pages. Additionally, there is somewhat limited analysis of the politics, economics, and ethics of digital technology in education in general (Selwyn and Facer 2013), and this could become a way that the research in this PhD study is developed in the future.

There were reflections from teachers who revealed that their school had assumed that they would be able to configure and use systems for teaching because they use technology in their day-to-day life. In fact, many teachers were inexperienced at this, and during the lockdown teachers felt anxious and worried about their proficiency using new electronic systems. As a work around, many teachers worked with colleagues for support in any way that they could, and in one case, a younger teacher completed most of the online work for another older and
less technical skilled teacher during lockdown. I argue that in a constantly evolving and digital world, there is no thought to accessibility for teachers, and this supports the findings of Weible (2018). It would be advantageous to understand the primary drivers behind teachers who suffer from anxiety in completing tasks that involve social media or technology. This would allow an insight into how CPD, attitudes and values can be developed to realise these particular needs.

Whilst discussing pedagogical activities, such as creating collaborative groups for TEL, TEL case studies, tutorials and tests and assignments were seen as being of least importance. In fact, only 0.74% viewed the assessments as the most important use of social media. Discussions around assessment in education are long standing. Many educators disenfranchise assessment as a pedagogical task, in others, some view learning and assessment as different entities. The conflict between teaching for learning or teaching for assessment is part of a wider education conundrum. Nevertheless, these themes do resurface in conversations involving technology. As an example, assessment was often an afterthought by school leaders when deciding which remote learning platform to pursue during lockdown. Many platforms did not have sufficient functionality to meet the teachers’ minimum requirements for assessments, as many recalled they had to use multiple screens and clicks to view work. Rather than transforming assessment, technology was a time bearing resource used for assessment. Future research should explore teachers’ needs in terms of assessment, such as the desired features and functions, however, most of this comes from a better understanding of pedagogy in general. This has perhaps been an oversight by the technology companies, as well as the policy makers. The study evidences that both do not really have a grasp on pedagogical needs in general.

The study explored the similarities and differences between platforms such as Facebook and Twitter, and those designed specifically for educational purposes, such as Seesaw and Google Classroom. Educators welcomed the additional functionality of products such as Classroom and Seesaw as they addressed issues such as cyberbullying and ensured regulation.
(i.e., teaches accepting and rejecting posts). Whilst educators used Twitter and other major social media platforms to network with other professionals and even share resources, they did not view them as a way to embed pedagogy with the exception of YouTube. I recommend further study on the educational specific social platforms that differ from VLEs. This is a niche yet growing market in education and even since the start of this study, there has been further growth as with Natterhub (for Primary), and GoBubble.

6.6 Reflecting on the whole PhD

Reflecting on the whole PhD was certainly challenging despite using YouTube and blogs to reflect along the way. When I started this journey, I was passionate about technology transforming education because I had seen how it can be done in the workplace and in the private sector. Whilst writing the proposal, I became aware of challenges beyond economic infrastructure as to why technology in pedagogy hadn’t really worked. Therefore, it was interesting to explore the literature and in particular the CPD taking place in schools. From day one, I used Trowler’s (2008) socio cultural theory to underpin my work and I became immersed in the idea that social interactions are important for learning, and that thought should be given to our educators’ relationship with technological tools.

Writing the literature review was my favourite section as I was learning significant amounts about the topic I am passionate about. It was also reassuring to read about other authors who shared the belief that there are links that can be made between social media and education. This part was completed between Y1 and Y2, before Covid-19.

The methods section was the most difficult to write. My background is in quantitative research, so analysing data using qualitative methods was new for me. I was able to evidence understanding of research paradigms and how they link to my approach to research; I am pleased with adopting the model of the mixed method for my data collection. Before beginning of this programme, I was inexperienced with these type of approaches to social science
research. I think spending a vast amount of time on my literature review, reading similar studies, and learning about their methods was beneficial.

It would be unfair to those students whom Covid-19 has impacted in really significant ways to say that I have also been impacted by the pandemic. This is because I have been in a relatively privileged position as I have gained further awareness of the challenges in using technology in education, which has been advantageous for this study. My only concern whilst collecting the data was that I did not want it to become a study on Covid-19 and technology in education. During the interviews I ensured that the teachers recalled experiences in a general pedagogical context. Interviews were conducted online, and I saw the benefits of this as it saved time, and I could conduct back-to-back interviews with teachers from different schools. It was somewhat challenging when the participants’ cameras were turned off. I was unsure of whether or not the participants were listening or how to pick up on non-verbal cues. These are all challenges with being an ECR completing online interviews.

Presenting the results of the survey was straightforward due to the functionality of the survey software. However, thematic analysis, coding and assigning themes were more difficult. As the data collection process was open for around a year in total, I had already begun the analysis process and new emerging themes that appeared afterwards became significant. I initially had trouble using SPSS and this was largely because of time spent away from the software, and issues with my hard drive space. Interestingly, YouTube was helpful in these initial refresher sessions. I had always thought that the discussion part would be my most important section as I couldn’t go back to my methods as I had already collected my data. I also linked the literature with themes that arose from mixed methods in a triangulation approach.

I also developed other transferable skills by enhancing my skills as a researcher through collecting data, finding themes, and analysing data. I am now increasingly critical in my
thinking and view situations through a 360 lens, and this will enhance my ability to solve problems throughout my career. I can now approach complex situations systematically, make links between ideas, evaluate arguments, and conclude with independent and original ideas.

I often found Skype and Zoom calls awkward, however this period of communicating with people online and in this fashion is a skill that I can adopt in the world of work post Covid-19. My communication skills were also enhanced through regular supervision with my supervisory team and presenting ‘work in progress’ at the postgraduate research conference. The quality and rigour of my written skills have grown as I conduct more reading and writing, and I am now more confident in preparing journal manuscripts.

Despite being a project manager, I had never really collected data over such an extended period, therefore, designing a timeline with this in mind is an attribute I can relay in my day-to-day role. I also learned more about collaboration regarding preparing journal articles, which was evidenced through successfully working with Dr Ewan Ingleby and Dr Gary Currie on a methodology paper for ‘Research in Post-Compulsory Education’ on visual research methods that were accepted for publication after review in July 2021.

I have always wanted to achieve a PhD ever since I first became an undergraduate in 2011, as I knew that it would be a challenging yet rewarding experience. I am thrilled that I have been able to work towards a PhD in a topic I feel passionate about. On a personal level, I have always wanted to go as far as I could in academia and reaching this point is a proud moment. I am also pleased that I chose Teesside University to complete my studies with, as Teesside has forward-thinking digital goals linked to my PhD. It has been very challenging to collect and analyse data and write up my findings as I have had to work around a full-time job as a software project manager, and a part time role as a lecturer. My main worry was time; however, I have learned to become much more efficient with my time. I work on my thesis in the mornings and at weekends, and my teaching role in the evenings. I think this shows how excited and
dedicated I am to my studies. It will be strange to have so much time after completing my PhD. This PhD has undoubtedly taught me that learning is never complete, and especially in my field where technology is continuously developing over time.

I have had great support and mentorship from my supervisory team, and I have really valued the monthly meetings and regular check ins. My director of studies shares the same belief that policy makers should have pedagogy expertise, which has been extremely useful.

6.7 Concluding remarks

In this doctoral study, I explored whether social media can successfully incorporate into pedagogy. I used a mixed methods approach consisting of interviews and a survey with secondary phase teachers as the research participants. Due to restrictions on minimum ages to use SNS, the secondary context was an interesting group to examine. Although, there was a focus on social media and social platforms, this study examined themes that are relevant to other parts of TEL. I found that CPD in TEL is severely underdeveloped. This finding was particularly interesting as many teachers do use YouTube in their practice. The training that did take place focused on the pastoral elements of cyberbullying and digital footprints over meaningful teaching. In this area, there is a lack of a link between pedagogy and technology. As technology moves quickly, educators must understand effective pedagogical strategies rather than focusing on the technology itself.

Aileen Kennedy’s (2005; 2014) transformative CPD model suggests that teachers may benefit from a community of practice, with professional development leading to greater teacher autonomy. The flexibility of transformative development is the capacity to adopt multiple personal and professional identities, and this is a more inclusive and social process. The PhD’s findings do not evidence significant transformative CPD as there are gaps in developing teachers’ past experiences effectively.
Moreover, there are complications in the terminology of TEL, leading to misconceptions around the benefits technology may bring to teaching and learning. As an example, many teachers were not aware of the term TEL, and preferred terms such as ‘EdTech’. The consequence of pushing generalisations results in teachers using iPads as a default reference point when discussing technology. There are profound distinctions between a tool such as an iPad and social media, as one can be described as substituting or augmenting a traditional task. In contrast, SNS may transform teaching in meaningful ways. Teachers used IWBs as an excellent example of a piece of technology that they could not live without for a day, compared with iPads that often sit idle and do not transform pedagogy.

The U.K. lockdown allowed for discussions and new policy to be made on technology in education for the purposes of remote learning. The study found a lack of pedagogical thought to decisions made at this time, as with previous implementations of technology. For example, teachers were jointly frustrated that the technology used to engage learners in a remote setting had limited functionality relating to assessment. There are other examples of absences of pedagogy from policy makers as with Ofsted, the teachers’ standards, political party manifestos, iPads in the classroom, and mobile phones being banned in schools.

In terms of social media, there are benefits in using some mainstream platforms such as Facebook, Twitter, and LinkedIn to engage with and network with colleagues. This is due to the community that can be created in addition to the sharing of valuable resources. However, these are not the ‘places’ to deliver pedagogy. Instead, education specific social media platforms ought to be the place for this. Some positive examples were used during the U.K. lockdown, whilst these differ from VLEs as there is a focus on social media features.

These themes were developed by Trowler’s (2008) underpinning socio-cultural theory that focuses on interactions being necessary for learning, and the relationship between people and tools. There are arguments throughout the literature describing the challenges between
education and technology. Digital technologies in the classroom is a relevant topic as teachers are becoming increasingly aware of the benefits, they can bring learning. The benefits of using social media and the growing role it has on education have certainly accelerated debates on how best it can be used to promote understanding and improve engagement (Lewis 2017; Marich 2016; McKay et al. 2014; Juno et al. 2011; Junco, Elvansky and Heiberger 2012). Students now expect that all their experiences are embedded with technology, whilst teachers face many challenges to meet these needs.

Furthermore, the workforce now demand that their employees are digitally proficient, social media savvy, and have a combination of hard and soft skills (Churchill 2019). Many of the difficulties in teaching with technology rest with policymakers and not teachers, which has been the case for a long time in education. Social media does hold the potential to be incorporated into pedagogy successfully, yet the administration to deliver positive outcomes such as learning, and engagement remain difficult.
POSTSCRIPT

Upon finishing the write-up of my PhD, I have been able to reflect on how my research processes were impacted by a nationwide shut down of schools in the U.K. UNESCO (2020) estimated that 1.6 billion learners were affected by Covid-19 and the disruption to learning. I have previously reflected through the period of remote working via blogs and vlogs; however, as teachers and learners return to school, it is interesting to explore the impact this has had in the context of my study. Moreover, I am going to look at the impact Covid-19 has had on TEL in secondary schools and whether some of the traditional complications associated with TEL were addressed. I will further reflect on whether the pandemic has generally made it easier or more challenging to implement the changes I proposed in this thesis. During the pandemic, I argued that this was advantageous for the collection of data; however, reflecting on this post-lockdown period is critical to truly understand the current state of social media and TEL in secondary schools.

Although it may always remain contentious when the pandemic actually began, for this purpose, most of my reference points will be from March 2020, in other words, the first U.K. lockdown. My PhD topic always aimed to explore the relationship between social media and pedagogy, and much of this interest stemmed from my professional work. The first lockdown began in the last few months of my second year, meaning I had well-established research objectives. Therefore, Covid-19 did not influence the creation of a research problem or how I determined by research questions.

Furthermore, I primarily worked off-campus due to my location, so the pandemic did not interfere with how I could engage with the literature. I remained able to access high-impact journals using the university's online library. This was also my preferred way of working, as I remained active in the field of educational software. Interestingly, the education agenda had shifted by the time I submitted my work, meaning that I had to revisit some of my earlier
chapters to ensure that they remained relevant and update my references to show this, such as Guckian et al. (2021), Dennen, Choi and Wood (2021), Martin et al. (2022), Lindly et al. (2022), and Otchie and Pedaste (2020).

Before Covid-19, my engagement with my director of studies was through a combination of face-to-face and online meetings, so this had to be adjusted for the pandemic to entirely online tutorials. Nevertheless, when the lockdown began, it was a busy time collecting data, so I spent less time writing my thesis and receiving feedback from my director of studies and increasingly more time scheduling and conducting the interviews.

In my thesis, I discussed how the Covid-19 pandemic meant I had to adapt my data collection, moving the interviews online, for example. However, I had never previously stated that I intended to do face-to-face interviews, and early discussions with my supervisor even mentioned a mixture of online and face-to-face interviews. In reality, it was unrealistic to travel across the country to interview teachers in different locations. In consequence, online interviews expanded my geographical reach. The pandemic did not necessarily result in exclusive online data collection, instead, it simply made it increasingly challenging. For example, I did interview a teacher face to face during the pandemic, although this was conducted in a neutral setting and not in the school. This was due to the teacher being part of my ‘bubble’. At the time, I was immersed in the data whereby I did not view this interview as remarkably different from the online ones, especially regarding the organization, timings, and key themes that emerged. This was due to the already established themes in phase 1 of the data collection.

Nevertheless, now that I have reflected on this experience, I argue that there are profound differences between being face to face with a participant, including non-verbal cues that relate to emotion and behaviour. This is highlighted in Cohen, Manion and Morrison (2018) as one
of the advantages of conducting interviews in this way. The ideal scenario would have been to interview teachers in their classrooms where technology would be present that may stimulate thought in combination with some online interviews. It was not a limitation to conducting interviews online, yet the participants being at home rather than in their school environment was not ideal.

Additionally, when interpreting the results, some challenging aspects were mainly due to participants having their cameras off for some of the interviews. However, on balance, I argued that ensuring the participants were comfortable in their home environment was significant for gaining rich and detailed insights. Despite having more time to reflect on this aspect of the interviews, my position has not altered.

Whilst this study was focused on social media, it was a broader contribution to the TEL literature. Covid-19 presented schools with opportunities whereby they were experimenting and trialling new technology that was not necessarily social media, but nevertheless had overlapping themes. Now that some time has passed, one of the primary outcomes was significant challenges for leadership teams within schools. Harris (2021) argues that Covid-19 illuminated an underlying leadership crisis in schools. School leaders generally avoided making decisions during the pandemic, which is viewed as being negative. Moreover, whether it is by design or default, school leaders have historically focused their leadership energies on ‘engaging others in the collaborative, shared and collective work that is both vital and urgent’ (Harris 2021, p. 325).

Harris (2021) argues that because of this leadership style, school leaders often filter out the noise to focus more on distributed leadership practices or to get the job done. Interestingly, school leaders have been highlighted in this way as it relates to what some teachers said about their leaders. Whilst it is difficult to criticize school leaders and their role and responsibility
during a pandemic, the general idea or value of just trying to finish the job is relevant in TEL. Teachers described that school leaders tend to focus on the ‘wow factor of technology’, such as the cost implications of iPads. There is little thinking about how teachers will teach with new technology. My findings remain relevant in terms of a need to enhance professional development in a more transformative way of working. However, the current analysis of school leaders is perhaps more critical of some school practices.

During this period, secondary schools were using technology in a novel way whereby live lessons were conducted online. Remtulla (2021) argues that teachers successfully conducted live lessons for 15 minutes, yet there were challenges when they began to differentiate or provide individual feedback. The fact that teachers were not in the same physical space as the pupils made communication challenging. Nevertheless, Remtulla (2021) suggests that this may result from technology not allowing for this type of interaction. This is again interesting as during my interviews, teachers mentioned that enabling instant feedback was the biggest challenge facing technology in education. These new Covid-19 findings support the work in this thesis that highlights specific features and functionalities teachers require. Some schools that subscribed to Google’s education package were much more successful at providing feedback to the individual, and this perhaps indicates that the challenges were a result of the technology.

Interestingly, some post-Covid-19 scholars, such as Harvey (2021), argue that technology merely attempts to minimize disruption, and the educational outcomes were ‘disastrous’. This is concerning as it is an example of using technology to substitute the classroom room experience, in other words remote learning, which consists of many challenges such as lack of staff training, limitations of the technology, accessibility for all children as with equipment and broadband. This thesis never argued that technology should replace face-to-face teaching; rather, technology, particularly social media, can be used in transformative ways. Social media
may enhance the classroom debate outside the traditional four walls but not replace it. The
digital divide in the U.K. is too great to make such an argument. Coleman (2021) concludes
that remote learning has led to inequalities in access to learning, with disadvantaged children
most affected. The digital divide has various dimensions: as well as access to devices and the
internet, digital skills are essential, as are external factors such as parental support, teacher
skills and learning environments. This is representative of challenges in society rather than
criticisms of technology. Education has long sought to minimize societal divisions, and
technology can be used as a tool to promote inclusion, as is evident with Weible’s (2018) access
and assistive technologies.

Thus, I believe that due to the unexpected pandemic, issues with remote learning, and
educational outcomes being lower than before Covid-19, a section of educators will remain
sceptical about the role of social media in education. This is despite some well-publicized uses
of technology, such as teaching students at a distance using tools that enable synchronous and
asynchronous communication with the whole class, groups and individual children or young
people; access to learning materials; and interactive and collaborative activities (Starkey 2021).

I argue that HE is often increasingly accepting of new technology, and it may be worthwhile
to explore the post-covid-19 path to understand the future of social media and technology for
secondary schools. Many universities have now adapted hybrid working models, and
subscriptions to software such as Canvas, Teams and Google Classroom have remained high
to ensure the continuation of digital accessibility and live communication.

Some of the literature that has been published during and after Covid-19 have explored the
impact technology has had on the classroom. It is interesting to think about how some of the
new publications further contribute to the recommendations I proposed in this thesis. Firstly, I
argue that grouping all technology under an umbrella term is unhelpful as there are profound
differences between a tool such as an iPad compared with using social media for teaching and learning. However, some of the scholars have identified that this blurring may have significantly worsened during the pandemic (Coleman 2021; Dennen, Choi and Wood 2021; Martin et al. 2022), making my recommendations difficult to embed. Advocating the benefits of social media now must contend with the shortfalls of remote working.

However, I also identified failures by policymakers and school leaders on approaches to professional development and school policy. I proposed that school policy should be made by those with expertise in pedagogy (Ingleby, Wilford and Hedges 2019), in addition to CPD being transformative and away from an instructional uses of technology. Thus, it is pleasing to see that the role of school leaders is being thoroughly examined as evidenced in the work of Harris (2021). Identifying underlying issues with school leadership may present further opportunities for professional development to be focused on solid pedagogical strategies rather than the technology itself. Subsequently, school leaders evolving from the ‘getting the job done’ (Harris 2021, p.324) style of leadership may allow pedagogy to be considered during policy making in technology. Thus, I argue that my themes around CPD and policy in social media are somewhat closer to being realised than before the pandemic.
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Appendix 1: Survey questions

The survey was conducted using Online Survey and the below is an extract of the questions used.

Can social media be incorporated into pedagogy successfully?

0% complete

Participant Information
You are being invited to take part in this research project. Before you decide to do so, it is important you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Feel free to ask the researcher if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this. Click here to view the participant information sheet.

Key Contacts

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan Williams</td>
<td>PNC Researcher</td>
<td><a href="mailto:ryan.williams@tees.ac.uk">ryan.williams@tees.ac.uk</a></td>
</tr>
<tr>
<td>Ewan Ingleby</td>
<td>Director of Studies</td>
<td><a href="mailto:e.ingleby@tees.ac.uk">e.ingleby@tees.ac.uk</a></td>
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<tr>
<td>Cline Hodges</td>
<td>Supervisor</td>
<td><a href="mailto:cline.hodges@tees.ac.uk">cline.hodges@tees.ac.uk</a></td>
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</table>

To contact Teeside University direct, please email enquiries@tees.ac.uk or call 01642 392 131

Consent/Withdrawal

- I have read and understood the information sheet dated November 2019 for the above study and was allowed the opportunity to ask questions regarding the study.
- I recognize that my participation in the study is voluntary and I / have the right to withdraw at any time up to 31st May 2022 without giving reasons and without any of my rights being affected (e.g. legal rights).
- I recognize that my anonymity will be preserved and full confidentiality in regard to my participation in the research will be maintained.
- I understand that the recordings of interviews and transcripts of data will be retained by the researcher and will not be used for any purpose other than for the research described to me in the information sheet already provided.
- I have been informed that all interview transcripts will be stored within secure premises and on computer files accessible only to the researcher.
- I agree to take part in this study.

Digital Signature

Name: Required

Date: Required

Date needs to be in the format DD/MM/YYYY, for example 27/03/1980.

Powered by online surveys | copyright | survey contact details | Report abuse
Can social media be incorporated into pedagogy successfully?

14% complete

Introduction

Do you use social media in your pedagogy?

- Yes
- No

If not, why?

- Personal reasons (e.g. I don't have the skills)
- Social reasons (e.g. I've never seen a demonstration)
- Professional reasons (e.g. I've heard of negative experiences from colleagues)
- Other
Can social media be incorporated into pedagogy successfully?

28% complete

Part 1

Which of the following statements closely describes your use of social media?

- I use social media for professional reasons
- I use social media for professional and personal reasons
- I use social media for personal reasons

Which users do you connect/share with on social networking sites?

- Colleagues
- Other educators
- Educational organisations
- Students
- Friends
- Other

Previous  Next
Can social media be incorporated into pedagogy successfully?

Part 2

Which, if any social media platforms do you use in your teaching? For example, with planning, demonstrations, or as a resource. **Required**

- Facebook
- Instagram
- Pinterest
- Snapchat
- Twitter
- WhatsApp
- YouTube
- None
- Other

In your view, what are the most important and least important of your aims when using social media in your pedagogy?

**Most Important**

Please select

**Least Important**

Please select
Can social media be incorporated into pedagogy successfully?

Part 3

In your view, what are the most challenging aspects associated with using social media in the classroom?

- Professional development (e.g. no training on how to use it)
- School policy (e.g. mobile phone ban)
- Concerns around technology (e.g. no WiFi, slow systems, no devices to use)
- Other

Does your school provide training/guidance on how to use social networking sites for staff?

- Yes
- No

Does your school provide training/guidance on how to use social networking sites for pupils?

- Yes
- No

I find social media to be a tool that engages learners in the classroom

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly Disagree

I find social media to be a tool that improves the achievement of learning outcomes

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly Disagree

Does your school have a school social media group for students?

- Yes
- No

If not, would you like it to?

- Yes
- No

Do you use social networking to encourage interaction with classroom activities?

- Yes
- No

If not, would you like to be able to?

- Yes
- No
Can social media be incorporated into pedagogy successfully?

End of Survey

Thank you for taking part

- I have completed the survey

---

Can social media be incorporated into pedagogy successfully?

71% complete

Part 4

There are educational and practical benefits for students when teachers are social media proficient. For example, social media aids in helping with employability

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree
Appendix 2: Interview questions

These are the interview questions that were used during phase 2 of the data collection.

The questions were semi-structured and flowed with how the participants answered.

1. Teachers are using social media to interact with colleagues rather than students. Why do you think this is? What are the benefits? And do you think there is a place to communicate with students?
2. Most teachers that use social media tend to also use it at home. Do you think there is a link between social media that is used for everyday communication and the potential it has in education?
3. How satisfied are you with the technology in your school that you would be comfortable with more social media being used in schools?
4. YouTube is the most popular SNS for educators. Why do you think this is, and could you give any examples of it in practice?
5. Contrastingly, a less visual SNS, Twitter came 2nd, are there different scenarios where one would be preferred to the other? For example, YouTube in class. Twitter out of class with fellow educators?
6. Exams are seen as least important for social media use. Is this due to privacy concerns?
7. All teachers agreed that teachers need to be skilled up on social media as it may enhance students progression. What relevant CPD sessions are taking place right now?
8. How would you describe the training you have received on TEL/EdTech? E.g. what does the training focus on and how would you enhance it?
Appendix 3: Thematic Analysis Mind Map
Appendix 4: Ethics approval

Dear Williams, Ryan,

This email has been sent to notify you that the following ethics application has been approved by the committee:

Application Ref: SSSHLREC275

Project Title: An exploration into the pedagogical benefits of social media: Can educators incorporate social media into pedagogy successfully?

Please note: If the research should change or extend beyond the indicated dates, the application must be resubmitted detailing the the nature of the proposed changes and/or the revised end date for reapproval by the Chair of the Ethics Committee.

Kind regards,

Dr Katherine Swainston
Chair
Research Ethics Committee
School of Social Sciences, Humanities and Law

Please do not reply to this email directly, it is an automated email.
Appendix 5: Blogs and other reflective accounts during the doctoral journey

**Reflective Blog 1:** Fake News: the failures of big tech and education

**Reflective Blog 2:** Technophobes versus technophiles: understanding the enemy’s position through reflection
Link: [https://ipda.org.uk/technophobes-versus-technophiles-understanding-the-enemys-position-through-reflection/](https://ipda.org.uk/technophobes-versus-technophiles-understanding-the-enemys-position-through-reflection/)

**Reflective Blog 3:** Reflecting on what COVID-19 means for my research as a doctoral student.

YouTube Reflection 1: Video 1: Can social media be incorporated into pedagogy successfully?
Link: [https://www.youtube.com/watch?v=za9kKPHjy0g](https://www.youtube.com/watch?v=za9kKPHjy0g)

**YouTube Reflection 2:** Video 2: Is Facebook a publisher or public forum? And, what are the key definitions in social media?
Link: [https://www.youtube.com/watch?v=z2euACx28rw](https://www.youtube.com/watch?v=z2euACx28rw)

YouTube Reflection 3: Video 3: Social media in the classroom- the examples
Link: [https://www.youtube.com/watch?v=wRaAPZt9YOM](https://www.youtube.com/watch?v=wRaAPZt9YOM)

YouTube Reflection 4: Video 4: What will the future of education technology look like?
Link: [https://www.youtube.com/watch?v=dzFsoiRBzRo](https://www.youtube.com/watch?v=dzFsoiRBzRo)

YouTube Reflection 5: Video 5: What are VLEs?
Link: [https://www.youtube.com/watch?v=D6eX4qGv0Uk&t=22s](https://www.youtube.com/watch?v=D6eX4qGv0Uk&t=22s)

YouTube Reflection 6: Video 6: An International Context of Education Technology
Link: [https://www.youtube.com/watch?v=SNskqLIvWdQ](https://www.youtube.com/watch?v=SNskqLIvWdQ)
YouTube Reflection 7: Video 7: Reflecting on what COVID-19 means for my research as a doctoral student
Link: https://www.youtube.com/watch?v=uA0XP4cJA4U

YouTube Reflection 8: Video 8: Learning spaces and the relevance to my PhD on social media in education
Link: https://www.youtube.com/watch?v=Hypd_thybMI

YouTube Reflection 9: Video 9: My anticipated findings
Link: https://www.youtube.com/watch?v=lfRTo2xzbiY

YouTube Reflection 10: Video 10: Inclusive TEL: How technology can personalise learning
Link: https://www.youtube.com/watch?v=WE9w_p9Uw_8&t=307s
Appendix 6: Participant characteristics

At the start of the survey, participant characteristics were captured:

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