

ONLINE LEARNING AND PEDAGOGY IN FURTHER EDUCATION:
FRAMEWORKS FOR SUCCESSFUL IMPLEMENTATION

By

Steven Spence

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Abstract

The quest to improve education through the integration of technology has been deliberated for many years, including governments and policy makers dating back to the formation by the Department for Education (DfE) of the National Council for Educational Technology (NCET) in 1967. Bespoke to the Further Education (FE) sector was the Further Education Learning Technology Action Group (FELTAG) that was set up in January 2013 to advance the use of technology in FE, releasing a report in 2014 with key recommendations for the sector. For all the support across the sector from the Education and Training Foundation (ETF), JISC and the Association for Learning Technology (ALT), and the education technology strategy released by the Department for Education in 2019, the use and critical debate of technology in education became more prominent at the onset of Covid-19.

This programme of research as part of a Professional Doctorate (Prof D) aimed to ensure that the primary research carried out impacted directly on professional practice. Aligned to this aim was the philosophy of pragmatism and the action research methodology, enabling the research to be contextualised and grounded in practice. Moreover, pragmatism enabled scope to utilise the most appropriate approaches to finding the answers to clearly defined research problems with action research supporting key stakeholders and practitioners to contribute and enhance practices through simultaneous research and action. In addition, interpretivism was crucial for both understanding reality through the experiences of the participants, understanding and making sense of real-world complexities, and also in enabling me as a researcher to interpret findings and reflect through the action research cycles, in acceptance of my own passions, beliefs and principles as grounded in the process as both a learner and researcher throughout the entirety of this Prof D.

Three primary research studies were carried out in total. The first research study focused on the initial explorations into remote learning as a response to Covid-19, with data collected through a survey. Research study two focused on gaining a better understanding of what constitutes effective online practices with data collected through two focus groups. Finally, research study three via the

expert interview method proved essential in consolidating knowledge and enhancing professional practices.

A pragmatic research philosophy in combination with an action research approach ensured that the requirements of the Professional Doctorate (Prof D) to influence both practice and the generation of knowledge were met, with the research findings from each study leading to tangible outputs to practice. These outputs included the development of a digital development programme; a college-wide vision and strategy for the use of technology; the implementation of non-judgmental approaches to the observation of online delivery; and a range of continuing professional development (CPD) that balances the fundamentals of technology with the fundamentals of how we learn. Pleasingly, the outputs of the research did also impact positively on key performance outcome data the college is judged against, further emphasising the importance of the research.

To conclude, my journey through this Prof D has resulted in me developing as a researcher, and this development will underpin institutional initiatives and strategies in my future endeavours and working practices. The use of reflexivity was also pertinent for developing my approach to research, enabling me to reflect on a multitude of decisions throughout, shaping both the research and me as a researcher. During this Prof D, I was promoted to a Principal position, with greater strategic autonomy. I now know that my foundational pillars defined and shaped through this Prof D will influence the policies, strategies and processes I put in place in the future regarding research at an institutional level.

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List of Abbreviations

Abbreviation	Full Terminology
DfE	Department for Education
NCET	National Council for Educational Technology
FE	Further Education
FELTAG	Further Education Learning Technology Action Group
ETF	Education and Training Foundation
ALT	Association for Learning Technology
Prof D	Professional Doctorate
M Ed	Master of Education
GFEC	General Further Education College
TLA	Teaching, Learning and Assessment
CPD	Continuous Professional Development
GFEC	General Further Education College
PhD	Doctor of Philosophy
EdTech	Education Technology
VLE	Virtual Learning Environment
BECTA	British Educational Communications and Technology Agency
UK	United Kingdom
CLT	Cognitive Load Theory
TPACK	Technological Pedagogical Content Knowledge
PCK	Pedagogical Content Knowledge
STEM	Science, Technology, Engineering and Mathematics
OECD	Organisation for Economic Co-operation and Development
SET	Society for Education and Training
VR	Virtual Reality
EIF	Education Inspection Framework
AfL	Assessment for Learning
TA	Thematic Analysis
CSCL	Computer-Supported Collaborative Learning

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Preface: Researcher's Personal Background and Thesis Context

Within this preface, I discuss the pertinent elements in my journey that led me to complete a professional doctorate (Prof D). In the sections below, I give an overview of my personal background, the context for the thesis, my motivation and a statement of intent, where I make explicit how I have tried to meet the aims of the doctoral programme.

The premise of this preface is to give the reader an insight into my background so they can understand my journey as a learner throughout this process. In doing this I hope that my passion for the sector I work in – the Further Education (FE) sector – is evident, as is my outlook to enhance the use of research from within the sector.

In appreciation of my role in the programme of research as both a learner and a researcher, from the outset it is salient to explain the role that personal narrative and reflections have played in developing me as a researcher, and the research produced during this Prof D. Within the methodology chapter, in all three primary studies, and in the conclusion, research reflections are completed. Reflexivity (Olmos-Vega, et al., 2022) was also used throughout to enhance the research carried out and my own development as a researcher. For example, through reflexivity I was able to utilise reflective writing and collaborative reflections and consider how personal, interpersonal, methodological and contextual reflexivity could influence my research findings through a personal autobiography (Ellis, 2004), evident throughout. This new knowledge and experience gained has proven valuable throughout, positioning my own development as a researcher as paramount within this Prof D.

Finally, it is important to state that my background and passion to develop practices in the FE sector played a huge part in completing this programme of research; I feel a deep connection to the sector and have done since I first joined the sector in 2006. I have always been an advocate for developing practice through research and for many years worked to support this notion within FE.

The idea that FE is sometimes forgotten in the educational landscape (Foster, 2005) is a narrative I have both felt and tried to improve upon, especially through placing the onus on the teachers and practitioners to lead with research (Ainscow, 2018). These reflections and my passion for the sector have shaped my outlook, with my role and experience within the sector proving vital for the positionality of this thesis.

Personal Background

When I started this doctoral programme of study, I was an established educator, primarily in the further education (FE) sector. I had completed a master of education programme (M Ed) with my thesis based on educational neuroscience and following one year of deliberating my next move in terms of my own personal study, I committed to this professional doctorate (Prof D). The main reasoning behind this was my passion to impact on practice and the 'way things are done' in the sector through research, as opposed to just a programme of theoretical research. Having completed eight years in the sector at the point of starting this Prof D, I was acutely aware of what I wanted to achieve, but also what I felt the sector needed in terms of research. All too often the FE sector had become the distant relative of school and university education (Foster, 2005) and it was an aim of mine to create a practitioner research culture from within the sector, i.e. research done from the sector for the sector. I felt I had started some of this work during my M Ed and wanted to develop further through this doctorate study.

From a personal perspective, I have always had a keen interest in how we learn, and how this can best be put into practice in different fields of instruction. My early passion was in the field of sport, and I completed my first degree in the subject in 2004. I still have a huge interest in sport and sports performance both professionally and personally, and it was the area that I taught when I first entered the teaching profession, at the University of Derby in 2006. As I started in the profession of teaching, I soon developed a real enthusiasm for the science, art and practice of good teaching and

education. When I commenced my role at the University of Derby in 2006, I was obligated to complete my teacher training alongside my work, which I loved and fully engaged with. This normally entailed a full week of teaching followed by my teacher training classes running at the end of Wednesday, normally from 4pm to 8pm. I thoroughly enjoyed this but it was at this point I realised that it was not the same for everyone, which is understandable, as it was a big commitment to teach and study to teach at the same time. For me, it was not a problem and something I thrust myself into.

I was developing a keen interest in education, and found myself going above and beyond and reading deeply into all things education, from the sociology and history (mainly of my sector) to theory and philosophy and the science of how we learn. It was the latter that interested me the most, and complimented my knowledge and passion for sport. I could see many similarities in my early readings in sport and sports performance and the principles of good teaching from an educational perspective, and this would be the start of a journey that I am still on today – ensuring that education is designed and delivered in the most effective way, underpinned by the science of how we learn, to support all students to develop deep knowledge to become fluent in a given domain.

I moved from the university to South East Derbyshire College in 2008 to take up a full-time permanent contract teaching sport. The college was classified as a general further education college (GFEC) and the role encompassed teaching at a range of levels. In the summer of 2010, South East Derbyshire College merged with Derby College, where I stayed until 2018.

Due to my background and passion to focus on the design and delivery of curricula, when career planning I wanted to focus on these progression routes opposed to other managerial opportunities. I wanted to be involved in developing practice and the methods used to deliver education as opposed to managing spreadsheets and people outright. I initially progressed into a course leader position and subsequently team leader positions in 2010 and 2011 respectively, and

this certainly enabled me to focus my passion on what I enjoyed. The structure at Derby College in 2012 had two progression options available for those in my role, one was a Team Manager position, the other was a Learning Director position and it was the latter that would become my focus. The Learning Director role was responsible for supporting the practice of teaching, learning and assessment (TLA) across academy areas, in my case, sport and public services. This included supporting staff at all experience levels through coaching and mentoring, leading continuing professional development (CPD) for the department and running projects to enhance TLA across the department. Following the completion of my M Ed, being recognised as an outstanding practitioner through both internal and external observations, and achieving consistently strong outcomes on my programmes, I was successful through an application and interview process in 2014 and commenced my duties in the Learning Director role over sport and public services.

This role was key to improving the practice of TLA across Derby College following Ofsted reports in 2012 and 2014 that deemed the college to be requiring improvement¹. It was a role that I personally thrived in as it enabled me to do the things I was passionate about whilst having greater responsibility and progression. I also continued to teach as part of the role, which was also very important to me. Pleasingly, Derby College achieved a very strong Ofsted report in 2016, and I was delighted that my faculty received a special mention in the verbal feedback from the inspectors to the executive leadership team and in the published report².

Following the positive Ofsted report and the needs of the college, I was promoted to a senior position that worked cross-college. This entailed leading all of the learning directors at the college and strategically planning to continue to develop TLA and our approach to curriculum design and delivery. It was my first role that dealt with strategy as opposed to operations, and something I quickly developed in to. More importantly for my motivation, the underpinning responsibilities of

¹ These Ofsted reports for Derby College can be accessed here <https://reports.ofsted.gov.uk/provider/31/133585>

² Derby College Ofsted report 2016 makes reference to teaching and learning in practical and vocational subjects <https://files.ofsted.gov.uk/v1/file/2556792>

the role were still based on where my passions lied, developing TLA practice and innovating our curriculum design and delivery.

I thoroughly enjoyed my time at Derby College and gave my all to the organisation, staff and students, but in 2018 an opportunity arose at The Sheffield College that I felt compelled to take. The Deputy Principal and Deputy Chief Executive at Sheffield was previously at Derby College, and someone I had a great deal of respect and admiration for, and I wanted to prove myself at another institution. I started at The Sheffield College in October 2018 and it is my current place of work. I am currently the Assistant Principal for Teaching, Learning, Assessment and Innovation and it is a job I am privileged to hold. I have responsibility for all aspects of TLA, teacher development, curriculum innovation and our digital transformation. I directly lead and oversee several strategies and policies at the college, including the Teaching, Learning and Assessment Improvement Policy and our Strategy for Digital Transformation.

Thesis Context

I started this Prof D in September 2014 with credits recognised from the completion of my M Ed. I completed the scientific evolution assignment achieving an excellent grade and submitted my research proposal to commence part two of the doctorate, which was accepted in August 2015 to commence in September 2015. The research for my doctorate would be based in the FE sector and support my job roles, the needs of my institution and in some respects the wider sector. Although the initial proposal combined research into the post-16 curriculum for sport and developing pedagogical excellence, both key aspects of my role at the time (Learning Director for Sport and Public Services), the thesis traversed in a different direction at certain points. The initial research was successful and led to a published article³ but due firstly to a change of role, and then institution, the focus, aims and outcomes of the research and thesis were adapted following conversations with

³ Article available here

<https://www.tandfonline.com/doi/abs/10.1080/13596748.2018.1444391?journalCode=rpce20>

my research supervisors. Although there was a little disappointment with this, there was actually much to learn from the experience as a learner and a researcher. Firstly, the article was successful and I gained great experience and knowledge in working through the editorial and publishing process in one of the most respected journal publications within the FE sector. Submitting the article in the requested format, adapting to the word length without losing the power of the article, and keeping to the deadlines on request gave valuable learning experiences. In terms of the Prof D, as a learner I knew that the decision was correct and I had to be adaptable and resilient in dealing with the need to reshape the thesis, something that has continued to be vital and assisted me in my professional life. A great example of this was in the lead up to and during the recent Ofsted inspection at the college⁴, where I utilised some of the key learnings from dealing with this decision during the inspection. For example, ensuring I gave myself 30 minutes reflection time on my own at the end of every day; staying in the moment and dealing with the facts required; and seeing challenge as opportunity. The noteworthy aspect here is that through reflection I have benefitted from this experience. Moreover, and due to the strategic aspects of the new role at The Sheffield College, the thesis would have greater impact and stature at a cross-college strategic level, which is an important aspect of my professional role. Subsequently, the thesis aligns to my role, the needs of my institution with the impact of the research tangible, which is a key aspect of the Prof D.

The Sheffield College

My current employers – The Sheffield College – have played a huge role in my research and the final outputs and thesis are based on my work at the college. The college provides academic, vocational and professional qualifications, from entry through to degree level, to around 14,000 young people and adults a year. The college are the largest apprenticeship provider in the city and region, working with approximately 2,700 employers who are involved in apprenticeships or provide work-related activity and industry placements. As the only General Further Education College (GFEC)

⁴ Inspection report available here <https://files.ofsted.gov.uk/v1/file/50206667>

in Sheffield and the largest in South Yorkshire, the college is very mindful of its obligations and responsibilities to the communities it serves, ensuring that it is developing and delivering learning programmes to enable people to gain the knowledge and skills required by employers and society both now and in the future. The college offers over 500 learning programmes across five main sites, and currently employ over 1,300 staff in a wide variety of roles.

Demographics – South Yorkshire Mayoral Combined Authority (SYMCA)

With this Prof D based at The Sheffield College, the below gives a brief overview of the region the college is situated in, and offers contextualisation to the research:

- Sheffield has a population of approximately 575,000 and is the third largest English district by population
- Unemployment in the city, including youth unemployment, and the proportion of adults without any formal qualifications are above the national average
- Sheffield's unemployment rate amongst people with work-limiting disabilities is 8.6%, which is slightly above the national average of 8.1% nationally. There has, however, been a positive trend in Sheffield, with the unemployment falling from 13.4% five years ago
- Sheffield has a comparable level of 16-17-year-olds not in education and training (8.7%) to the Core City average (8.6%). Across Sheffield, the rates are highest amongst males (10.7%) and amongst white (9.8%) and mixed-race young people (11%)
- The proportion of workless households is significantly greater than the Yorkshire and Humber average
- The local economy retains a strong advanced manufacturing sector but most employment is within the service sector, particularly in health, social care and finance
- The college's student population draws from a wide range of areas across the city but predominantly from areas of significant deprivation

- Of the aged 16+ population in South Yorkshire Mayoral Combined Authority, 49% are male and 51% female
- The South Yorkshire Mayoral Combined Authority has a slightly younger age profile than the average nationally, with 15% of those aged over 16 under 24 years old, compared to 13% nationally
- There is less ethnic diversity in the South Yorkshire Mayoral Combined Authority, with 92.8% of the 16+ population being white, compared to 86% nationally
- A higher proportion of the working age population in the South Yorkshire Mayoral Combined Authority are classed as EA core or work-limiting disabled compared to the national average, with rates particularly high for females
- Skills levels in the South Yorkshire Mayoral Combined Authority lag national levels, with fewer residents qualified to NVQ Level 4 or above and more with no qualifications than nationally
- On average, students who studied at The Sheffield College and achieve a Level 3 qualification will earn £6,888 a year more than someone with no formal qualifications in South Yorkshire Mayoral Combined Authority. This equates to approximately £261,000 in higher earnings over a working lifetime⁵

My Motivation

My enthusiasm and passion for the FE sector coupled with my motivation to continue to improve how an institution's curricula is designed and delivered has helped me stay focused throughout my period studying. I still get the same enjoyment now as I did when I attended my first PGCE session back in 2006 in seeing practice develop and teachers and subsequently students thrive.

⁵ This data was taken from an independent report that is available for public viewing on the College's website. The report is called Demonstrating the Value of The Sheffield College.

This doctorate has those principles at its heart, and the focus of developing an institution's provision through digital and online pedagogies is the key focus of the research.

My personal ambitions have also been supported through this Prof D. Firstly, my intent to develop as a researcher who produces research that has tangible impacts on practice within a sector and working environment have been realised and developed throughout. Underpinning this, and developed throughout studying for this doctorate, is my alignment to the pragmatic approach to research that I have found encompasses my beliefs and subsequent approaches to how I have conducted research to date and will continue to conduct research in the future. This is also closely related to a much improved and better knowledge of how action research is used effectively in an educational domain.

Secondly, my career aspirations have also been supported through this Prof D programme, as I have received several promotions throughout the programme, including moving to a new institution and having cross-college responsibility at a senior level. My motivation is to continue my journey in the FE sector, working hard to give myself an opportunity to become a college principal in the future. Additionally, I wish to continue to develop my external reputation and have the potential option of starting my own consultancy, supporting a range of educational institutions.

Finally, and an important point to conclude with, is the genuine passion I have for seeing all students from all backgrounds have equity of opportunity and the chance, through education, to realise their own dreams and aspirations. As a teacher, I could directly influence the students in front of me, but since moving into strategic leadership positions, I now see it as my duty to support all staff to develop as teachers and practitioners to enact this vision.

Statement of Intent

The rationale for choosing the Prof D over a classical Doctor of Philosophy (PhD) route was mainly due to the need to influence practice within my research setting. Accordingly, and due to my

employment in the FE sector, the research needed to inform and enhance practice, and the research was very much grounded in the sector.

Having carefully researched and considered a range of options following the completion of my M Ed, I was delighted that I could continue researching on a doctoral programme that was most relevant to my own career goals and aspirations, but also my own values of educational research.

The quote below resonated with my ambitions when committing to the Prof D route:

‘The Professional Doctorates need to be seen and treated as research degrees that produce doctoral thinkers and doers in specified areas of professional practice and by different means.’

(Powell & Long, 2005, p. 27)

Commencing my studies at the University of Central Lancashire the Prof D had two components comprising of a taught element and the independent research leading to the submission of a thesis. Due to enrolling following the completion of an M Ed, several modules were accredited as prior learning, but I completed the Scientific Evolution of Working Practice module, receiving an excellent grade. Following this, I commenced my independent research as part of my thesis.

Within the handbook I obtained as I commenced this Prof D at the University of Central Lancashire, four outcomes were listed. Below is a brief overview of how I achieved these within this thesis:

Outcome 1 – Design and conduct an investigation into a contemporary professional issue in a specific performance domain. The outcomes of this investigation should make a significant and demonstrable contribution to professional knowledge and practice, whilst also extending knowledge in pertinent academic disciplines.

Within this thesis, a detailed literature review was completed to support the working context for the research. Following this, three independent studies that are related enhanced professional knowledge and practice related to the use of technology in the design and delivery of education in the FE sector. Additionally, each of the three primary studies have a detailed literature review. Each of the three studies, through a pragmatic approach to research underpinned by an iterative process of action research, produced tangible outputs, thus advancing professional knowledge and practice. Within the three primary studies and following the conclusion, a section titled '*Links to Professional Practice – Impacts on Practice*' aligns new and enhanced knowledge with refinements and innovations to practice. For example, new knowledge and research outputs that had great impact at the college included the design and implementation of a digital development programme that was enhanced throughout the research; a clear vision and use of a VLE; the engendering of communities of practice bespoke to technology; a new process for developing practice through observation – online reviews; tailored CPD that enhances the practice of digital tools but is underpinned by key learning principles; and staff empowered to innovate through delivery approaches and tools.

Outcome 2 – Critically assess, select and implement appropriate research methodologies and methods within complex professional contexts.

Within the thesis, a detailed methodology was completed explaining and justifying the choices made in terms of methods and methodologies selected. Aligned to my own interpretive stance and driven by a pragmatic research philosophy, the action research methodology was employed with a range of aligned data collection methods appropriate for the professional environment where the research was carried out. Moreover, through these carefully considered approaches to the research, the impacts were theoretical but importantly impacted on professional practice. Trustworthiness was also employed through a range of techniques, including member checking and reflexivity to provide an audit trail for the reader, balancing the interpretive role in the

creation of knowledge, with the steps taken to arrive at this. In addition, each primary study has a section titled *'Research Reflections'*, where major methodological decisions were reviewed and evaluated. Finally, within the thesis conclusion a section titled *'Personal Reflections – My Development as a Researcher in the Field of Education'* supported a final concise evaluation and review of methodological development throughout the Prof D.

Outcome 3 – Synthesise, interpret and apply relevant theoretical frameworks and research findings in relation to complex performance contexts and issues.

Within each of the three primary studies, a detailed approach to data collection and analysis was implemented and explained within each of the methodology sections. Imperative to the thesis was the theoretical basis underpinning the need for the research, with a large focus on what constitutes effective instruction and practice, extant literature on effective instruction bespoke to online provision and frameworks such as the Technological Pedagogical Content Knowledge – TPACK framework (Mishra & Koehler, 2006); the Replacement, Amplification and Transformation framework, or RAT (Hughes, 2000; Hughes, et al., 2006); and the Substitution, Augmentation, Modification and Redefinition model, known as SAMR (Puentedura, 2006). In addition, the Further Education Learning Technology Action Group (FELTAG) report (2014) also served as a theoretical basis for pre-pandemic integration of technology bespoke to FE, with the rapid pace of research released during the thesis also becoming integral and supporting the theoretical basis of the research, for example Hodges, et al., (2020) article highlighting the difference between established online provision and emergency remote teaching.

These salient theoretical frameworks aimed to ensure the relevance of each of the primary studies and that the findings synthesised new knowledge and practice in the field. Moreover, the findings from each of the three studies resulted in tangible outcomes detailed in the *'Conclusion'* and *'Links to Professional Practice – Impacts on Practice'* sections. Finally, in the thesis conclusion,

the impacts as a result of the research at The Sheffield College are listed and supported with a range of testimonies emphasising the importance and value of the research.

Outcome 4 – Engage in and manage a process of reflective development leading to the enhancement of your own professional practice and performance within a specific domain.

Throughout the independent thesis as part of this Prof D, I completed reflective writing and collaborative reflection with my research and supervisory team to support the enhancement of my own development. This was completed through a process of reflexivity and detailed in each of the primary research chapters, as well as the methodology and conclusion chapters. The final section within the conclusion focused on my own developments as a researcher. In terms of the development and enhancement of my own professional standing within my domain, I detailed in the thesis conclusion the personal recognition, conference appearances and publications I have achieved throughout the course of the Prof D. In addition I have detailed the external recognition the college obtained through initiatives that were as a direct result of the research I carried out as part of the Prof D. Finally, the impact of the research was considered in relation to the verified and published data obtained at the college pre, during and post the programme of research carried out.

In summary, this thesis has met the four outcomes detailed in the programme handbook discussed above and prove to be a significant programme of research in my field, that advances both theoretical knowledge and practice within one large FE college whilst garnering a high degree of respect across the sector.

Chapter 1: Introduction

Chapter 1: Introduction

This chapter outlines the context and background of the programme of research. Firstly, the research aims and objectives, and the structure of the thesis are covered. Following this, the FE sector in England is introduced to give a brief insight into the sector in which the research was conducted; this includes how the research links to my current professional employment. The chapter concludes with a focus on online learning, with a brief history given to provide context to the research. Within the final part of the chapter, the impact of Covid-19 is also discussed, as this has clearly influenced digital and online provision, and the use of EdTech.

Research Aims and Objectives

The thesis aims to investigate the effective use of EdTech and online practices, with each of the three primary research studies forming part of this. The aim of research study one was to investigate the perceptions of remote and online teaching as Covid-19 forced the first national lockdown. The following objectives formed the basis of the study:

- 1) Analyse the views of delivery staff following the move to emergency remote teaching.
- 2) Evaluate the key priorities to be addressed to enhance one large FE college's approach to remote and future online delivery.
- 3) Synthesise clear strategic direction to remote and online delivery and learning for the new academic year.

The logical progression from study one was to go deeper into what constitutes the effective use of technology and online practices. Study one was very much exploratory, using a large sample, the logical progression was to use a smaller sample that enabled deeper explorations and fact-finding.

Research study two then built on the work in study one by further exploring what effective online TLA comprised of, which was the aim of the study. The objectives of this study were:

- 1) Identify commonalities in approach and delivery of effective online delivery and learning.
- 2) Consider and explore the priorities for developing online practices at individual and institutional levels.
- 3) Contextualise online learning approaches to the needs of FE colleges to ensure that the research impacts on professional practice.

At this point, I envisaged a funnelling system, that started wide to explore many variables in study one, with refinement permitting a greater depth of understanding in study two, with study three focused on the finer details, in support of the final iteration of actions. Logically, this also was supported by the action research cycle, with study three aligned to the reflecting stage. Study three aimed to consolidate the findings from the previous studies to ensure a developmental framework could be created based on sound evidence. The objectives were:

- 1) Refine and consider what should be included at an institution when implementing effective EdTech to support online delivery and learning.
- 2) Finalise a programme of development for staff to develop their digital skills and confidence in order for an institution to deliver high quality online provision.

Thesis Structure and Research Studies

The overarching aim of this thesis and Prof D is the development of online practice and pedagogy, and how this can and should be advanced in FE colleges. The use of EdTech and online tools, and the vision for online learning has been prevalent for some time now in the education sector, without ever offering the solutions and impact that it could (Laurillard, 2008). However, as the Covid-19 pandemic swept across the world at the start of 2020 there was a never-before-seen need for online learning and pedagogy to continue to offer education. The pandemic forced

institutions and teachers to implement and use online learning like never before, with emergency remote teaching becoming prevalent (Hodges, et al., 2020). The use and implementation of EdTech and online tools was catapulted to the forefront of education, offering online learning a pedestal like never before. Consequently, the requirement for online methods and modalities to be used effectively would be a challenge, with the research in this thesis notable in creating a solid evidence base of support for institutions now and in the future.

There is also a need to acknowledge my own motivations within the research, as discussed in the preface. The research was influenced, and to an extent driven by, my passion for the FE sector and my ambitions to enhance the design and delivery of the curricula on offer. My drive to improve the provision across the sector from research conducted in the sector has been vital, and shaped all aspects of the philosophical, methodological and the methods used. This has resulted in research that has tangible outputs, something that is essential to my approach to research in the sector.

Reflecting the above, chapter 1 sets the scene for the thesis by introducing the FE sector and the role of online learning in the sector hitherto. The introduction then concludes by setting out the explicit research aims and objectives and thesis structure.

Chapter 2 provides a review of the extant literature, with a wider focus on instruction to begin with, before introducing more specific literature concerning technology and online learning. Within this chapter, one section is germane in articulating how education technology can support the integration of evidence-informed practice, which is important, as often these are two separate camps who clash on their views of teaching, education and instruction. The chapter concludes by exploring some of the opportunities that digital and online learning offer to the planning and delivery of education now and in the future.

To ensure that the primary research studies detailed below were methodologically sound, chapter 3 details the steps taken to accomplish this. This includes the philosophical position, one of pragmatism, and action research as a methodological approach. These approaches were vital for

ensuring the research was grounded within the context it was carried out and most significantly, the research resulted in tangible improvements within real-world settings. To keep a balanced critique the chapter includes a section on the criticisms of pragmatism before then summarising why pragmatism suited both the research and the researcher. Specific and detailed methodologies are then given in each of the three primary studies. The chapter concludes by giving a brief history and overview of The Sheffield College prior to introducing reflexivity and how this would be implemented within the research.

Chapter 4 was the first primary study in this thesis and based on the response to Covid-19, with an exploration into the move to remote learning. This study was vital and captured data as it happened to enable the foundations of strategic decisions to be based on evidence within one institution. The study focused on gaining the views and perceptions of staff three months after the first lockdown in England (first lockdown commenced in March 2020). Stratified random sampling was used to gather data from 254 staff at one large FE college in England through a survey. Some of the key findings from this piece of research were that the majority of staff were confident in developing their digital delivery in the future and the most difficult aspects of online learning through the initial phases of the pandemic were student accessibility (no device or WiFi), student engagement and digital skills, and getting students logged onto the virtual learning environment (VLE). This research had immediate professional impact, with the college agreeing to put in place a mandatory programme of development for all staff to develop and enhance their digital skills. Additionally, the college implemented a clear vision for the future direction of their VLE, moving all delivery to the same set of tools and systems.

Chapter 5 was the second primary study and focussed on the development of effective online practices of teaching, learning and assessment (TLA). In order to do this two focus groups were carried out with eleven staff at one FE college. The eleven staff were specialists in online delivery and were purposefully selected for the research. Collectively, they had carried out over 220

supportive online observations and close to 350 coaching observations at the time of the focus groups. Key findings, including how online TLA differs from face-to-face delivery in terms of planning, approach and execution; the importance of developing the technical skills of staff to enable them to implement their chosen pedagogy; and that non-judgemental approaches to developing online practices have all impacted on strategies at the college where the research was undertaken. Moreover, and in combination with the findings from study one, there was a clear scope for the development of the content required in the digital development programme.

Chapter 6 was the final primary study and sought to build on the previous studies and triangulate concepts through an interview with Professor Paul A. Kirschner, an expert in the field of research, instruction, cognitive psychology and online learning. The systematising expert interview was carried out one-to-one and recorded online. Following thematic analysis, five key themes were established and confirmed the need to create a first-class digital development programme that supports the development of technical skills, but also recognises the key principles of how we learn must be incorporated into the programme.

Finally, chapter 7 offers a conclusion of the research including the impact on both theoretical groundings and current practices in the sector, which is a key element of the Prof D. A short overview of what future research should focus on is also offered. The chapter includes evidence of impact at The Sheffield College, including published outcome data and external recognition. Following this, personal recognition and testimonies are included prior to the final section of my own personal reflections as a researcher in the field of education.

In summary, the research contained within this Prof D pertained to advance theoretical knowledge and practices related to the planning and effective use of EdTech to advance the implementation of online learning practices. In this way, theory and practice are one, and informed action, or praxis (Freire, 1970) ensured the research impacted on professional practice in the FE sector.

The Further Education Sector – A brief overview

This Prof D thesis is situated in the FE sector in England. It is the sector where I have spent the majority of my professional career in education, and at the time of the submission of my thesis, I am in my seventeenth academic year in FE. My passion has always been associated with teaching, learning and assessment (TLA), and as I have progressed in the sector into senior positions, it has been to strategically lead all aspects of TLA. To further contextualise this; in my current role, I have responsibility for the quality assurance aspects of TLA, and the developmental aspects of TLA. Furthermore, enhancing learning through education technology (EdTech) is also a responsibility of mine. This includes how we plan and deliver aspects of our curriculum online, successful implementation of a virtual learning environment (VLE), and ensuring that staff are confident in the utilisation of EdTech.

The FE sector is associated with post-16 delivery; however, this does not paint the true picture of FE. FE offers such wide and diverse options from pre-16 education to adult education, programmes normally classified as academic, such as A-Levels to vocational and technical programmes. Furthermore, FE caters for all levels of students, from pre-level one to degree level study. This is part of the magic of FE; it serves such a diverse range of people, and inspires and offers opportunities for individuals from all different backgrounds. FE offers a lifeline for people who face social and cultural disadvantage, offers the opportunity to engage in education at multiple stages of life, and positively influences an individuals' family and often their community (Duckworth & Smith, 2019).

However, the sector has its challenges. Norris and Adam (2017) state how the sector has been defined 'by more or less continuous change over the last three decades.' (Norris & Adam, 2017, p. 5). This is further highlighted in their report as they state there has been 28 major pieces of legislation related to the sector; six different ministerial departments with overall responsibility: a

staggering 48 secretaries of state with responsibilities for FE; with no organisation (for example, the Learning and Skills Council; Quality Improvement Agency; Learning and Skills Improvement Service, which were all set up to support the sector but were disbanded before impacting any change) surviving more than a decade (Norris & Adam, 2017). Some examples of this change include the continuing study of both English and maths alongside chosen pathways if these GCSE qualifications were not achieved to a minimum of a grade C, now grade 4 at school (Department for Education, 2012; Department for Education and Department for Business Innovation and Skill, 2013). This directive was influenced by the preceding report by Alison Wolf (Wolf, 2011) and led to this being a condition of funding for FE providers, subsequently meaning that FE institutions have to cater for the continuing study of English and maths if they are to draw down government funding for a student. Changes to vocational and technical education have also been evident following the *Post-16 Skills Plan* reforms; with T-Levels introduced to prepare individuals for skilled employment (Department for Education & Department for Business Innovation and Skills, 2016). Just prior to this, changes were made to the leaving age with young people required to stay in education or training up to the age of 17 in 2013 and by 2015 this was up to 18 (Department for Education, 2016) , affecting the sector, as did the funding of apprenticeships (Education & Skills Funding Agency, 2018). Most recently, reports into the future of colleges post 2030 (Independent Commission on the College of the Future, 2020) and the recent government whitepaper *Skills for Jobs* (Department for Education, 2021), however positive and appealing, guarantee further change to the sector.

Any sector defined with continuous change and a lack of clear direction would suffer, and the notion of FE often feeling like the disadvantaged 'middle-child' operating between schools and higher education (HE) has been prevalent in the sector (Foster, 2005). Furthermore, FE is often referred to as the 'Cinderella' sector because, in comparison to compulsory schooling and HE, it is under-resourced, under-valued and under-researched (Mercer, et al., 2015). This constant change has not helped the FE sector, and this has been confounded by a lack of funding. Keep (2014) described the challenges facing FE, and how colleges must ready themselves for a new world. He

was clearly alluding to the funding changes following the recession and how this had ‘persuaded policy makers to embark upon a sustained period of deep retrenchment in government spending’ (Keep, 2014, p. 3). FE has suffered the most in the education sector in terms of funding cuts in the past 25 years, where spending fell faster in the 1990s, grew slower in the 2000s, and is one of the only areas in the education sector to see cuts since 2010 (Belfield, et al., 2018; O’Leary, et al., 2019). Additionally, funding for adult skills and apprenticeships reduced by approximately 45% in real terms between 2009-10 and 2017-18 (Belfield, et al., 2018). With the sector experiencing cuts each year since 2010, the maelstrom surrounding the sector has been evident to everyone in it and connected to it.

The recent *State of the Nation Report*, produced by the social mobility commission offers a stark reality of the truth. Those from better off backgrounds are almost 80 per cent more likely to be in a professional job than their working-class peers; social mobility has remained virtually stagnant since 2014; twice the number of disadvantaged 16-18-year-olds are in Further Education colleges compared to school sixth forms; student funding for 16-19-year-olds has fallen 12 per cent since 2011-12 and is now eight per cent lower than for secondary schools. (Social Mobility Commission, 2019).

The reach of the FE sector is far and wide, and it is a ‘powerful vehicle to drive forward social justice.’ (Duckworth & Smith, 2019, p. 65). The sector plays a key role in the improvement in social mobility across the country, and creating a fairer society.

‘Social mobility is not just about children from council estates becoming CEOs. We want to reduce the social mobility ‘Power Gap’ where those from better off backgrounds not only earn more money but control the levers that shape our society’

(Social Mobility Commission, 2019, p. vi)

Clearly the FE sector has many challenges, has gone through a period of change and uncertainty, and has suffered most through government funding cuts. However, the need to offer an

excellent educational experience is still a priority. FE cannot be seen as education for 'other people' (Thomson, 2015), and must ensure that students get a high quality of education. This doctorate is underpinned with the realisation that there are many challenges in FE, but there is always great optimism and opportunities to continue to impact positively on the life chances of those who study in FE. The effective use of EdTech to support online and blended provision certainly offers exciting opportunities for colleges to reimagine the design and delivery of their curriculum, and despite the funding cuts discussed above, the sector has great potential to utilise EdTech to minimise the impacts of such cuts, whilst continuing to offer a modern learning experience that enables students to progress and be successful in employment. All of this however, is only possible if the utilisation of EdTech is effective and offers high quality provision, as part of face-to-face, blended and fully online delivery.

Online Learning in Further Education

Debates around the use of EdTech and online learning and approaches bespoke to FE are not new. In 2004, a report that gathered both student and staff data stated as one of its main findings 'The key message is that staff and students are prepared for greater use of ILT/e-learning' (Learning and Skills Development Agency, 2004). A decade later, The Further Education Learning Technology Action Group (FELTAG) was set up to further advance the positive use of technology in FE. Some of the key recommendations from their report was that all courses should include a percentage of online learning, and a greater onus should be placed on the development of staff, with benchmarks created to optimise the use of learning technology (FELTAG, 2014). On the back of this report, examples of effective digital practices were evidenced and reported in the JISC report that showcased many examples of effective digital practice from colleges across the sector (Smith & Bristow, 2018; Smith, et al., 2016). The action group did help to push technology and their recommendations were followed up through special interest groups and through JISC and ALT, but the recommendations were not fully engendered across the sector. Further momentum was gained following the ECORYS UK report that identified four key recommendations for the government in

providing focus and leadership, all based on improving digital skills, with recommendation three focused on how FE and HE should partner with industry to make the development of digital skills relevant to industry (ECORYS UK, 2016). Another report then recommended further strategies for building digital skills in the FE sector, with the scaling up learner's use of digital methods; collaboration with employers; teacher development and strategic leadership proposed (Laurillard, et al., 2016). It was then a further three years for the first national EdTech strategy to be produced by the Department for Education but this continued the positive drive to at least appreciate and recognise that technology could be useful in education. As well as the development of skills and capabilities, the strategy also reflected some of the wider infrastructure issues pertinent to embedding effective EdTech. For example, ensuring the correct fibre connectivity, infrastructure to support cloud-based solutions and greater clarity of software resources available for procurement (Department for Education, 2019). Moreover, there has always been great support for both the integration of technology into education and FE through support agencies. The first agency to support the integration of technology in education was the National Council for Educational Technology (NCET) in 1967, set up by the Department of Education, which became known as the British Educational Communications and Technology Agency (BECTA) in 1998. This emphasises the will to develop the use of technology to support learning and education is not necessarily a new idea. Finally, agencies such as the Education and Training Foundation (ETF), JISC, Ufi Charitable Trust and the Association for Learning Technology (ALT) have in more recent years offered specific support and funding to the FE sector to enhance the use of technology in education.

The Impact of Covid-19

However, and although much of the excellent work detailed above has offered progress, arguably, the greatest accelerator in recent years was the onset of the Covid-19 pandemic, largely due to the requirement of institutions having to teach online in some way. Throughout the world, the need to use aspects of technology to teach and deliver learning was required in a way never seen before, and the uncertainty of the duration of the pandemic meant that individuals and

institutions had to plan to rely on technology for the foreseeable future. It led to what Hodges et al (2020) would term 'Emergency Remote Teaching', and almost overnight the terms synchronous and asynchronous learning became endemic in every conversation. As did the use of platforms such as Google Meet, Microsoft Teams and Zoom. It also led to Ofsted commissioning research into effective online provision (Ofsted, 2020) and a further review in June 2021 published by the Department for Education, again reviewing key literature related to online and digital education (Hamer & Smith, 2021). These reviews were developed and released to support educational institutions to have some evidence-base to work from as they continued to deliver parts of their curriculum through technology and online.

The impact of the pandemic was vast with 1.5 billion students in 188 countries locked out of their schools in the first year of the virus (OECD, 2021a). Countries with lower educational performance closed for longer periods in 2020, which is concerning and 'means the crisis did not just amplify education inequalities within countries, but it is likely to also amplify the performance gap among countries' (Ibid, p.4). The inequities were also highlighted in the labour market with the fall in hours worked for high skilled workers only 8.5% compared with 24% for those without an upper secondary education (OECD, 2021b). However, and on a more positive note, there was great evidence of positive innovations from teachers and institutions to create better infrastructures and offer learning in ways that may be of benefit to governmental approaches to education in future years (OECD, 2021a; OECD, 2021b).

Research in England and the United Kingdom (UK) confirmed a worrying picture, with estimations through Ofcom's Technology Tracker indicating that between 1.14 – 1.78 million children under the age of 18 had no access to a laptop, tablet or desktop in their households in the UK (Roberts & Danechi, 2022). Moreover, 'Ofcom estimated that between 227,000 and 559,000 lived in households with no access to the internet at home, while a further 473,000 to 913,000 lived in households whose only access to the internet was via mobile.' (Roberts & Danechi, 2022, p. 23).

The impact of this on learning loss is starting to become evident, with disadvantaged children and those living in disadvantaged areas affected the most (The Education Committee, 2022). Regional variations are also worrying, as The Education Committee (2022) report states:

‘We are also concerned about the regional variations in learning loss. Pupils in the North East and Yorkshire and the Humber experienced the greatest learning loss in the first half of the autumn term 2020/21 (around 2.4 months and 2.3 months respectively in primary, and around 1.6 and 2.5 months respectively in secondary). The same areas also experienced the greatest loss in mathematics (around 5.1 and 5.7 months respectively). This was more than double the loss experienced in the South West and London’. (pp. 3-4)

Clearly, the priority has to be creating a system that is equitable before the potential of technology can be harnessed fairly for all students, as the Covid-19 pandemic served to highlight the link between poverty and digital inclusion (Holmes & Burgess, 2020).

Evidently, the interest in how technology can support education and learning is not new. However, and although attempts have been made to enhance the use of technology in the FE sector, no strategies and/or policies have hitherto had the desired impact. The need to move past the current use and excitement in the use of EdTech elevated by the pandemic to something more long lasting and sustainable is vital, and the need for research in the sector on what constitutes effective online practices and technology integration is required, and that is the premise for this body of research. Moreover, the opportunities to promote online education and technology during the pandemic has given a great platform to build on in terms of what EdTech, digital tools and approaches to online learning could offer to the way education is delivered in future years.

Progressing into the next chapter – the literature review – a review of the current approaches to technology integration will be completed, with reference to the latest research into instruction. This will prove important during the primary research studies, as some of the salient outputs from the research is to develop approaches to the effective implementation of technology.

A large aspect of this will be defining what is effective, and then through the research engendering a process for designing and implementing effective online provision through effective use of technology. Where this thesis adds to the theoretical debate, is the gap between the research on effective instruction and effective use of technology, that too often are discussed as separate entities. In the literature review, and then through the subsequent research outputs, these will be utilised together.

Chapter 2: Review of Literature

Chapter 2: Review of Literature

Chapter Preface

All too often, the camps of education and technology have polarizing views. This may explain the lack of progress in the use of technology to support innovation through online and blended methods across the educational landscape (Department for Education, 2019; FELTAG, 2014; Laurillard, 2008). This chapter will firstly review literature on effective instruction to ensure that an explicit understanding of how we learn, no matter the modality, is understood. Following this, the focus will move to highlighting how the evidence base of how we learn can be supported through the use of EdTech. Finally, the chapter focusses on some of the key literature related to technology and online pedagogies. By bringing the extant literature on effective instruction and technology integration together, the literature review will be better placed to create tangible developments following the subsequent research studies, and close the current theoretical gap, which I believe has hindered the progress of technology integration to date.

Effective Instruction

Debates regarding effective instruction for education and learning are not new, for example, scholars have proposed theories such as behaviourism to cognitivism, to the philosophy of education and what this means in practice, and this is still evident in the present day in the education landscape. Central to this debate are two opposing positions, that of instruction being designed so students can discover or construct their own learning (Bruner, 1961; Steffe & Gale, 1995) as opposed to direct instruction, that places greater emphasis on learning being closely led by an instructor, especially in the initial phases of learning or with novices (Rosenshine, 2012; Shulman & Keislar, 1966; Sweller, et al., 2011). Directly addressing this issue Kirschner, et al., (2006) state that instruction based on strong guidance, as opposed to minimal guidance is most effective, despite the

attractive allure of the latter to educators. Furthermore, minimally guided instruction ignores the structures associated with our cognitive architecture (Kirschner, et al., 2006). In direct response to the aforementioned article Schmidt, et al., (2007) agree that minimally guided instruction is problematic for novice learners, however, argue that to equate problem-based learning (PBL) with minimally guided instruction is incorrect, and PBL can be skillfully planned and adapted to suit the needs of learners. This is certainly an excellent point to raise and proposes that PBL, if used effectively, will not necessarily run into the issues Kirschner, et al., (2006) highlight with minimally guided instruction. Moreover, and although Sweller, et al., (2007) stand by their 2006 article (the Kirschner 2006 article is by the same authors) they do acknowledge some common ground with PBL and the response by Schmidt, et al., (2007), namely that the structure and scaffolding is imperative to the success of PBL (Sweller, et al., 2007, p. 119). Darling-Hammond., et al., (2020) further support this notion in relation to what they call inquiry pedagogies, with well-designed scaffolds and ongoing assessment vital for success with these approaches.

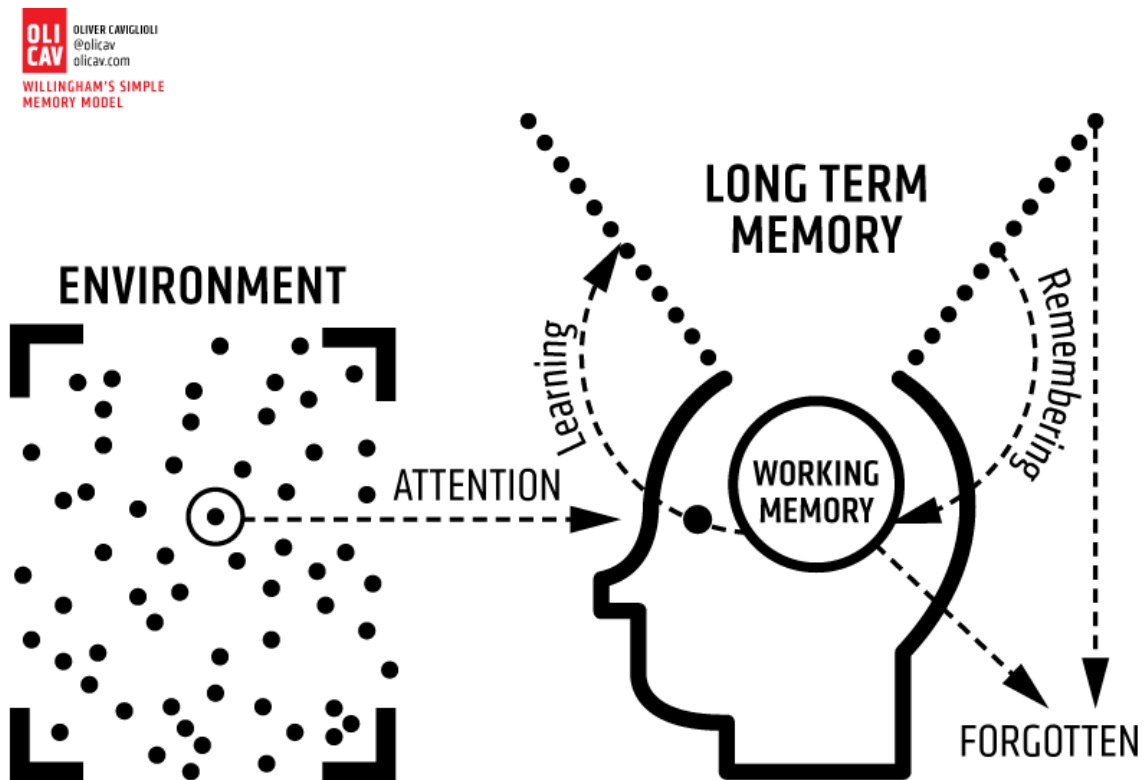
Clearly, the difference between what is perceived as minimally guided, constructionist learning and direct instruction is obvious, but the points above do indicate that on closer inspection there is a need for greater consideration into instruction. Interestingly to those designing curricula, in his recent work this is actually acknowledged by Paul Kirschner, who states in his Ten Steps to Complex Learning book that the arrangement of the steps may be 'reflective of a moderate – constructivist view of learning...' although the Ten Steps do place a greater emphasis on the guidance provided (van Merriënboer & Kirschner, 2018, p. 315). Furthermore, when analysing Rosenshine's principles (2012) that support direct instruction, these could be adapted and applied in PBL approaches if the instruction was designed well enough. For example, guiding practice and checking for understanding would be a key element of PBL as well as direct instruction, thus, the most important aspect in educational contexts is the understanding, development and application of instruction. For example, more guidance is required for novices in the initial phases of learning but this is not the case for students who have developed high levels of knowledge and skill (Sweller, et

al., 2003). This is known as the expert reversal effect and should be factored in when designing any programme of learning. Furthermore, and when designed effectively, direct instruction and PBL must be designed with these concepts in mind, thus meaning that if using PBL as an instructional technique for novices, great care must be given to the initial learning phases. Clearly, any learning designed on a whim will not be successful.

Although the research is strong and continues to influence the educational landscape (for example, Rosenshine's principles have been made into an educational guidance book), there is also a case for understanding the context, subject and previous experiences of students when designing any effective educational programme. For example, understanding the context of FE in England is vital, often offering students a second chance at education, which presents challenges immediately. Understanding this context is also essential when designing learning pathways (Kuhn, 2007). Moreover, an appreciation of the subject content may also play a part when designing instruction. For example, the need to ensure worked examples and clear and direct guidance for a subject such as math would seem obvious, ensuring that students working memory is not burdened by unwanted materials and that it can focus solely on the learning tasks. Then, as students learn key steps the worked examples are reduced, scaffolding learning until students master topics. However, research also questions the effectiveness of Cognitive Load Theory in mathematics learning (Aditomo, 2009).

Sweller's Cognitive Load Theory (CLT) (Sweller, et al., 2011) has gained greater respect in the educational landscape in recent years, indeed William (2017) stated on Twitter that 'Sweller's Cognitive Load Theory is the single most important thing for teachers to know'. Indeed, the theory gives a clear indication on how to base effective instruction when delivering learning based on our cognitive architecture (Kirschner, et al., 2006). Key to CLT is the relationship between working memory and long-term memory, based on a model by Shiffrin (1968) (cited in (Kirschner, et al., 2006)). The diagram below gives a simple visual overview of this:

Diagram 1 - The Relationship between Working and Long-Term Memory



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Although CLT offers great potential for educators, and has become very popular as a theory linked to supporting effective instruction, one challenge for the theory is the objective measure of cognitive load, as opposed to indirect or subjective measures (Martin, 2014).

Although this section has briefly covered debates regarding effective instruction, the underlying importance of this in relation to the outcomes of this thesis are how these debates are constructed into the landscape of digital pedagogies and online instruction. For example, situating direct vs minimal guidance must be linked to the practice of digital pedagogy. Furthermore, CLT must be appreciated in a digital mode of delivery, which makes this research vital in shining a light on the science and practice of digital and online pedagogy.

In his more recent work Paul Kirschner does acknowledge how digital technologies support the development of complex learning systems. In fact, van Merriënboer & Kirschner (2018) make

reference to flipped learning, blended and game-facilitated learning with reference to the ten steps to complex learning. This is certainly interesting for this research and bridges the gap between specific and classical instruction evidence and research into digital pedagogical research.

Accordingly, this section identifies the following fundamental questions:

- How does the research from effective instruction apply to online pedagogies?
- What are the known benefits technology can offer institutions to enhance learning for their students?

How evidence-informed practice and EdTech can intersect to support learning

A gap in the theoretical framework that I believe important is the lack of alignment of the evidence base developed through educational research and how that can be implemented through the use of technology. I believe this important and a good starting point for developing technology integrations that are based on reputable evidence. For example, at times the EdTech community have in my opinion not helped to establish a route for positive integration, and often relied on questionable research and made tenuous links to technological integration. A good example of this was an article from May 2020 published in FE News titled 'How Education Technology Works for Every Learning Style'⁶ which resulted in debates on social media, with a few of the threads on Twitter from the educational community rightly criticising the article. The article was written by a Vice President at a leading EdTech manufacturer. The article was based on learning styles, which have very little evidence to support their use in education (Coffield, et al., 2004; Geake, 2008; Goswami, 2006; Purdy, 2008; Riener & Willingham, 2010), and what is required is an analysis of reputable research and evidence that can be implemented through technology.

In the next few paragraphs, I put forward some of the most established research from the evidence base of education, and discuss how this could be integrated in practice through

⁶ Article available here: <https://www.fenews.co.uk/skills/how-education-technology-works-for-every-learning-style/>

technology. The rationale for this is to directly link evidence and the use of technology together, in an attempt to establish common grounds.

The first piece of research of focus is by Dunlosky, et al. (2013). This paper presents a systematic overview of the research around effective learning strategies. It has been widely acknowledged as a key piece of research that many teachers and educators have utilised in their practice. The key findings listed in the paper were that practice testing and distributed practice are highly effective learning strategies. The research team who conducted the work and subsequently released the paper are some of the most prominent cognitive psychologists and educational researchers of the current time. The methodology section was detailed, and it is fair to say that the research is very well respected.

A key point to ask to consider at this juncture is whether technology would be useful in integrating these strategies. This is often missed, and something that is lacking from the technological frameworks (see next section) and often from my own experiences in trying to enhance learning through technology for several years. As I reflect now this is a key point to raise, and something I will reflect on through reflexivity in later sections to ensure I control the potential bias influencing the research, from my positionality of being positive about the integration of technology.

I believe technology could prove a great tool for implement these strategies. It is very simple to set practice tests in whichever is the most suitable format to ensure that students are going through the process of encoding and retrieving key information, thus strengthening vital connections that underpin learning and developing schema (the term schema was first introduced by (Piaget, 1952)). A key point to mention here is that practice testing is part of the learning process, and low-stakes tests and quizzes are simple to set up through a wide range of software and platforms that all teachers can benefit from. Furthermore, and related to the ease of which practice testing can be supported through EdTech, is how the same applies to distributed practice (spreading

out study and practice). EdTech gives the opportunity to create materials (including practice testing) that distribute learning over a prolonged period of time, enabling the deep learning of concepts to constantly build and develop in relation to new knowledge acquired. There is also the potential for teachers to develop this during the planning stage of delivery, with materials only being released at certain points throughout a year, or when certain progress markers have been met. I believe these uses of technology have not been established well enough at the current time, and it is important to consider these uses in detail when attempting to implement technology into curriculum design and delivery. The simplicity in which EdTech can support practice testing and distributed practice is positive, especially with research highlighting that students don't always use the most effective strategies if left to their own devices (Foerst, et al., 2017; Karpicke, et al., 2009; Kornell & Bjork, 2007).

Research into interpolated testing is another example of well-established research that can be implemented well through effective technology use. Interpolated testing is based on the premise of administering some form of testing during the input (lesson/lecture). Szpunar, et al., (2013) found interpolated testing beneficial for sustaining attention, improving note-taking and reducing test anxiety when a programme of study is assessed through large summative exams. Pastötter and Bäuml (2014) state that information is more likely to be remembered when testing has been implemented and suggest that interpolated testing enhances learning of subsequent, not yet studied information. Finally, Healy, et al., (2017) found improvements in motivation and retention through their research into interpolated testing. Two studies do question the positive impacts of interpolated testing, suggesting that frequent testing between retrieval and encoding impairs new learning (Davis & Chan, 2015; Davis, et al., 2017)⁷. It is possible that this could be integrated successfully as EdTech makes it very straight forward to embed quick tests into lessons/lectures to challenge students to be attentive to key information throughout the duration of delivery. A myriad of EdTech enables this

⁷ I also refer to this research as I worked with Dr Philip Higham from the University of Southampton on a pilot study around the use of interpolated testing in education, following his own research showing the value of it.

approach, from basic testing embedded into presentations, to quizzes, to specific software. Embedding interpolated testing is very simple to do, and one of the benefits of using EdTech is that all the questions and resources are always available for use at a later time, or as part of other effective techniques discussed previously (for example, questions used within the lesson/lecture could be incorporated into later practice testing). Furthermore, and with video tutorials being utilised more than ever in education, it is simple for the content to be broken up with short retrieval quizzes to support the learning process. It is imperative to make the link here between effective and evidence-based methods and strategies, and technology integration. I believe it is something that has hindered the integration of technology (Department for Education, 2019; Laurillard, 2008) and should underpin approaches to effective technological integrations.

To conclude this section, two further examples from the literature and evidence base which are considered vital in the role of learning are offered. Firstly, that of practice, and to be more specific deliberate practice (Ericsson, et al., 1993). There is a plethora of research into the role of practice and over recent years this has been captured in mainstream media with books such as *Outliers* by Malcolm Gladwell; *Talent is Overrated: What Really Separates World-Class Performers from Everybody Else* by Geoffrey Colvin and *Bounce: The Myth of Talent and the Power of Practice* by Matthew Syed. As with all research and inquiry there will be contentions along the way but it is generally accepted that practice, and the right kind of practice, are imperative components for learning. The same can be said of assessment, with much research supporting the impact of assessment in learning (Black & Wiliam, 1998; Black, et al., 2003; Kluger & DeNisi, 1996; Shute, 2007). As with the previous sections, I believe it pertinent to highlight how technology can support and even enhance these well-established strategies for learning.

The correct use of EdTech can support students to engage in meaningful practice in any subject, at any time, with the teacher directing this practice through carefully designed activities. Rosenshine (2012) states the importance of practice in supporting students to overlearn and

become fluent in a skill, and this can be supported through EdTech, for example with worked examples available for students to complete online, with the scaffolds reducing as they become more proficient. Furthermore, and closely linked to the above point, it is now easier to utilise assessment for learning in practice resources, to inform future delivery. This assessment for learning can be in any form, from multiple choice questions to actual exam questions, and much of the marking and assessment can be done through automated means to save time for teachers (as with every technique, this must be used effectively and not over relied upon). An additional bonus of using EdTech is all resources can be kept, shared, released at certain points, adapted with minimal effort and planned to distribute learning.

This section set out to put a case together for how EdTech can be used effectively in correspondence with research and evidence. It's relevance to the subsequent research in the thesis is the understanding of what may be incorporated in the development of staff in order for them to delivery effective online or through blended provision. For example, a teacher may want to complete a recap quiz online but may not have the skillset to do so. This is an important point for consideration related back to the research questions, and trying to build a successful framework for technology integration.

Established Frameworks for Online Learning and Integration

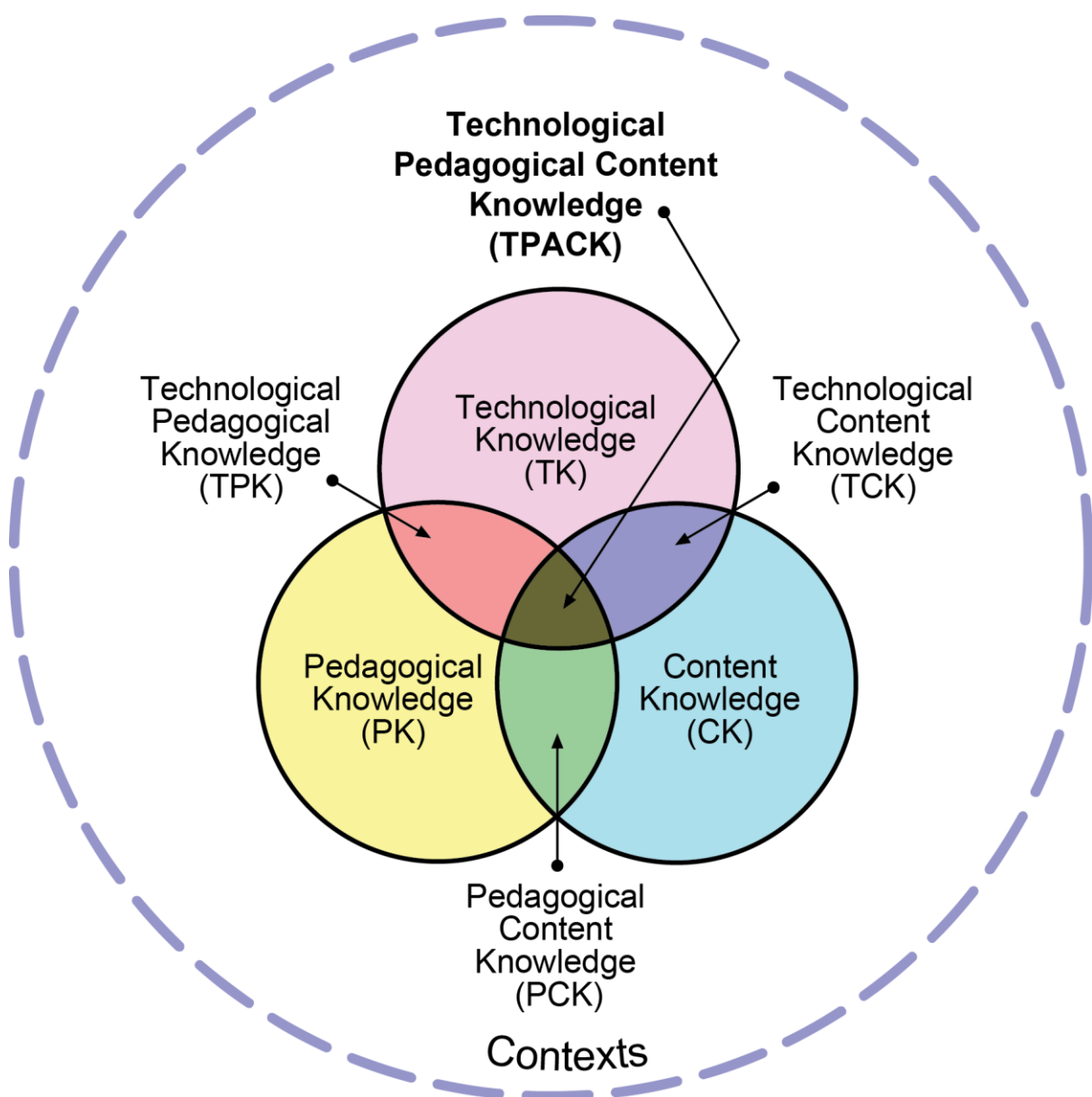
Frameworks for the successful implementation and integration of technology have been established in the literature in recent times. Mishra and Koehler (2006) proposed the Technological Pedagogical Content Knowledge – TPACK framework⁸. In their 2006 article Mishra and Koehler consider why the vision for the use of technology in education is not matched in reality.

The TPACK framework introduced the idea of technology into the knowledge base teachers would need in order for successful integration. In doing so, the theoretical framework for TPACK was

⁸ Note, in the original 2006 article the acronym was TPCK but this was developed to TPACK in subsequent versions (Schmidt, et al., 2009).

aligned to the premise of pedagogical content knowledge (PCK) devised by Shulman in (1986), who questioned how policy makers of the time had used research to inform ideas for teacher education, 'in their necessary simplification of the complexities of classroom teaching, investigators ignored one central aspect of classroom life: the subject matter.' (Shulman, 1986, p. 6). Twenty years later, Mishra and Koehler (2006) following five years of research, defined technological knowledge alongside pedagogical knowledge and content knowledge and how these interlink, shown below:

Diagram 2 - TPACK Framework



A key premise to TPACK is the understanding ‘that there is no single technological solution that applies for every teacher, every course, or every view of teaching’ (Mishra & Koehler, 2006, p. 1029) and that ‘quality teaching requires developing a nuanced understanding of the complex relationships between technology, content, and pedagogy...’ (Ibid).

Other frameworks to support with the integration of technology are evident, such as the Replacement, Amplification and Transformation framework, or RAT (Hughes, 2000; Hughes, et al., 2006) and the Substitution, Augmentation, Modification and Redefinition model, known as SAMR (Puentedura, 2006). These models share similarities in the way they map out the use of technology through a simple taxonomy for teachers to follow, with RAT having three layers as opposed to the four offered by SAMR. The final stages of these models are concerned with the use of technology to transform (RAT) or redefine (SAMR), thus meaning technology advances instruction to previously inconceivable places.

As with all models and frameworks, the need to build up the evidence base in practical settings is required (Cox & Graham, 2009; Harris & Hofer, 2011) and due to the nuances between the frameworks, especially the TPACK in comparison to both the RAT or SAMR, the combination of approaches could also be a system institutions may consider (Alivi, 2019; Hilton, 2015). Research in practice is imperative for progress in the use of technology in education and learning, as too often the technology and evidence-based camps are too far away from common ground, which inhibits potential progress. In some respects, EdTech companies create the issues (Mathewson & Butrymowicz, 2020) which heightens the need for peer reviewed and respected research, such as the understanding of technological content knowledge (Koehler & Mishra, 2009).

Terminology

A plethora of terms are inter-related in relation to technology, learning and online practices. In their study, Singh and Thurman (2019) emphasise this following a review of terminology spanning from 1988 to 2018. Within their research they state that confusion does exist on both the definition of, and what constitutes, online learning (Singh & Thurman, 2019). In recent times, and following Covid-19, many more terms now make up the everyday discourse regarding technology and online delivery. For example, remote learning, which was the terminology which swept across the educational landscape as the pandemic commenced, and a term Ofsted used during their reviews (Ofsted, 2020). In addition, synchronous, asynchronous, distanced and blended learning all became words that were synonymous with education.

It is important to define some of these key terminologies, as although used interchangeably they actually have different connotations and meanings for practice. The overview below is important in defining key terms to enable clarity within this thesis. The definitions are adapted from Sue Greener's (2021) editorial review in the journal of Interactive Learning Environments:

- Remote learning – learning which happens when the student(s) and teacher(s) are not in the same place, and possibly not at the same time. This term was primarily used at the onset of the pandemic.
- Synchronous learning – learning which is live and in real time.
- Asynchronous learning – learning activity which is completed at different times.
- Distance learning – this would generally include the least amount of interactivity, with students working through materials via digital channels prior to completing a summative assessment. Within distance learning there is primarily a separation from distance and time, leading to most learning being asynchronous.
- Online learning – as with distance learning, course content will be supplied through digital channels, however, greater interaction will be planned into the design and delivery of the

course. An online course is developed with underlying principles of online pedagogies considered, and the use of digital tools to facilitate learning.

- Blended learning – this is also called hybrid learning and utilises both physical delivery in conjunction with materials or interactions delivered digitally. Flipped learning is a good example of blended learning, where content is delivered digitally prior to face-to-face sessions.

(Adapted from Greener, 2021)

To help with the confusion surrounding terminologies, frameworks to offer transparency have been developed, for example the Modes of Learning Spectrum (Johnson, 2021). Frameworks such as these are crucial in the planning and execution of a curriculum, and progressing beyond the token gestures of adding a resource to a VLE or leading a session online to meet the demands of including an online aspect in a programme. It is vital that leaders, especially those in curriculum design positions are transparent on the key modes of learning, plan accordingly to implement these and do this for the benefit of the students.

In addition to the above, the terms information learning technology (ILT), technology enhanced learning (TEL) and education technology (EdTech) are part of the rhetoric. Unlike the above where important nuances exist between the definitions (Greener, 2021), ILT, TEL and EdTech are mostly interchangeable as they are all related to technology being used as a tool to support, advance and innovate through the use of technology (Department for Education, 2019; Laurillard, 2008; Learning and Skills Development Agency, 2004). In practice, the terms have simply developed overtime from ILT to TEL, to the prominent terminology at the present time – EdTech. Importantly for the research in this thesis, the terminology will be correct and specific to the research carried out, so for example in the first primary research study the use of remote will be prevalent, but in the later studies the use of online is the more established term used.

Linking back to the aims of the thesis establishing the key terminologies is important for lucidity in what is needed for effective implementation of technology for online learning. To be effective, there needs to be clarity of information and understanding, for staff and leaders across an institution. In the subsequent research chapters the outputs from the research will need to define and redefine a product(s) for successful implementation, the correct terminology and what this means in practice is important for supporting this.

[The Pandemic, Education Technology – is there a conflict for educators.](#)

Although the above sections highlight and navigate key literature regarding education technology and its use in education, I have lived in this field for many years now, and witnessed first-hand the polarity of opinion regarding technology and education. As a teacher and educator with close to 17 years of experience, I have witnessed conflict at times, and have always tried to position and understand the polarity in views to better inform strategies, some of which are included here. It is also important for me to acknowledge that I have my own biases, and these will impact what I believe and do, no matter how much evidence-based research I read and complete, there is an inherent bias in my views. I find acknowledging this important, especially from a personal reflexivity perspective, discussed further in the methodology section, but acknowledging that our unique perspectives will influence research is a good starting point (Olmos-Vega, et al., 2022).

Interestingly, and as I reflect, my underlying interest in studying and researching in education is to improve how a curriculum is planned and subsequently delivered. In fact, I have always been very interested in the classical research in education, and the current thinking based on the most up-to-date evidence. I have always attended regular conferences and events in this field. However, there is an element of this searching for improvements that led me to look into the research and field of technology in education, one that I believed makes sense. It is only now as I reflect back on how opposed the camps of EdTech and evidence-based practice really are, that I believe the bridge is not too far (Bruer, 1997), and the camps can support each other. Reflecting on

this stance, I often feel unique in my position, as through my lived experiences there appears to be a position in one camp or the other, and through this research and Prof D I hope to bring them closer.

Anecdotally, and through my own experiences as an educator before, during and after the pandemic there are some obvious conflicts that impact on the views of educators and their use of technology. An obvious one to start with is the confidence and experience of using technology in practice. This conflict is very much apparent and from my experience does influence the take-up of digital and educational technologies. Where staff feel more comfortable, they are more likely to contemplate the use of technology in their practices. Research also supports this (Compeau & Higgins, 1995; Shea, 2007; Tabata & Johnsrud, 2008; Zhen, et al., 2008). As I reflect on this it is an important point to consider, and actually, the notion of pressuring teachers and educators to embed technology is wrong in my opinion. The use of technology should be considered and implemented due to a specific need, for example, the need to embed retrieval practice into a programme of learning, or improve assessment for learning practices. Even prior to this doctoral study, I had already started to develop this idea and believe it to be key in alleviating the issue of an educator feeling forced into something. This doesn't work with any new strategy or method, not just technology. In fact, at this point, the notion of effective professional development (PD) is closely related, and that is certainly something I hope to achieve through this Prof D. If the approach to PD is poor, it is unlikely teachers and educators are going to see the value in something, so the approach to the PD is a vital aspect that can cause conflict if not carried out in the right way.

Another important conflict to consider is the ability of teachers and educators to be reflective. This could be constrained by other factors, in my experience it often is, but without reflection, it is difficult to identify the elements in practice that could be improved. As the increasing workload has risen in education, and the high stakes nature of an institution's performance against the sector average, time for quality reflection has been reduced. From my own anecdotal perspective, I have witnessed the contact time for FE lecturers increase from 800 hours to in some

cases 860 in my time in the sector. This creates issues for several reasons, and is actually outside of the technology in education debate, however, through my reflections it is an important issue. It also links to the first point raised regarding confidence and experience, as it is hard to get that without the time to be reflective and engage in high-quality PD.

Another conflict, which I have witnessed in my own experiences is that some teachers and educators just don't see the benefit of using technology. This has been well researched (Laurillard, 2008; Laurillard & Masterman, 2009; Laurillard, et al., 2016) but to me is the most frustrating conflict, as technology makes it easy to embed some excellent evidence-based approaches (see section on page 46). Now, if someone has considered it and even trialled it with no success that is commendable but to simply rubbish the idea of technology is disappointing, and something I often witness by those aligned to the evidence-based camp. In my opinion, the point has always been to constantly seek developments to one's own practice. This may be through learning more about research by studying a masters, or developing new approaches to assessment, or utilising technology effectively. I have found through my experiences that in some cases when technology is the development, it can carry negative connotations. However, and due to the pandemic, more teachers and educators across the world are developing their digital skills, it will be interesting to see how this influences future practices.

Chapter 3: Methodology

Chapter 3: Methodology

Chapter Preface

This chapter details the philosophical and methodological approaches that underpin the research. Moreover, the research design and methods, including data analysis methods are also discussed, as are the limitations of the research. A section on reflexivity is also included and this is vital, as it is used to enhance the quality of the research, but also as a tool for enhancing me as a researcher. This last point is especially pertinent, and throughout this section, the reader will gain insights into the thought processes behind the deliberations and choices as I ‘think aloud’ (Pinnock, et al., 2015) to depict the research journey.

Research Philosophy

In order to meet the aims of this programme of research the implementation of a research philosophy would be of paramount importance. The philosophical approach would need to match the complexities of the research environments where new knowledge would be gathered, that of education. By nature, and as with many environments, the world of education is complex, with a heavy reliance on data in some quarters, namely reporting sources, yet, within the sector research would lend itself to understanding the views of participants and align to interpretivism (Bryman, 2012). Understanding and making sense of the complexities of the real world (Patton, 2002) is a challenge for all research, and the requirement to align the outcomes of this research to the most appropriate paradigm and philosophy is imperative. In addition, my values and positioning as a researcher would influence all aspects of the decisions throughout this section, with the need to influence practice within the sector a key priority, that must be enabled through the philosophical and methodological choices.

Due to the requirement throughout this research to gain ‘access to people’s common-sense thinking’ and interpret their actions and their social world from their point of view.’ (Bryman, 2016,

p. 27), initial deliberations led to approaches that supported a meaning-centred approach to research and aligned to interpretivist epistemology (Seale, 2006). This appreciation of knowledge belonging to the participants would enable their interpretations to be the foundation for new understandings. This also aligns to my experience in the education sector and is an important value of mine when conducting research. The requirement to understand the lived experiences of individuals in their reality is an important virtue in my research approach.

Furthermore, and due to the nature of knowledge being devised from the 'social actors' when considering the nature of existence, the initial ontological position aligned with constructionism (Bryman, 2016), whereby social phenomena exist for social actors, and their views of the world are created from their own mind. Naturally, and in-line with these philosophical and theoretical commitments, a qualitative strategy was initially identified (Seale, 2006) that would enable the research to be conducted with an appreciation of the ontological, epistemological and research aims which would emphasise the inductive nature (generation of theory) of the research (Braun & Clarke, 2013).

However, as the research progressed and the proposed outcomes were becoming more defined, and following my own reflections on what I wanted to achieve from the research, the need to consider other research philosophies became apparent, especially pragmatism and action research. At this point, I was developing my theoretical knowledge, which in turn was reshaping me as a researcher throughout the entire process. This was an interesting aspect of the Prof D as it was becoming evident that through my readings and advancing knowledge, my values and approaches would be enhanced and change for the better.

To conclude, positivism was the only major paradigm that didn't suit the research and could be eliminated quickly from the discussions. Positivism and postpositivism are often associated with classical scientific approaches to research and primarily associated with quantitative methods, where precision and generalisability are vital components (Kaushik & Walsh, 2019). Furthermore,

and due to the need for the research to have appreciations of subjectivity and relate to more inductive reasoning as opposed to deductive reasoning (Braun & Clarke, 2013; Bryman, 2016), positivism was not a viable option. Moreover, it is a strong belief of mine that understanding the reality of the participants in the research is key in educational research and something that I believe strongly, ruling out positivism. That is not to say positivism would not be useful in other fields, where variables can be easily matched and controlled, or even in randomised controlled trials, which also have a purpose in educational research.

Pragmatism

In its simplest form pragmatism can be thought of as an approach that has less boundaries, more fluidity, and attests to find solutions to real world problems. Pragmatism enables scientific inquiry and accepts all well-constructed paradigms that are relevant to obtaining useful results (Kalolo, 2015). Subsequently, pragmatism appears to suit the needs and requirements of educational research. Dating back to conversations in the early 1870s, which brought together the founding fathers of pragmatism, including Charles Sanders Pierce, William James, Chauncey Wright, Wendell Holmes Jr and Nicholas St. Johns Green, pragmatism as a philosophical movement was based on these scholars rejecting the more traditional assumptions of knowledge, reality and inquiry (Kaushik & Walsh, 2019). The philosopher John Dewey would also become a leading figure in the development of pragmatism in a time when the ideas of Darwin and scientific inquiry were the popular choice (Stark, 2014).

A pragmatic approach to educational research can solve the current crisis it is in (Badley, 2003; Kaushik & Walsh, 2019). Badley (2003) identifies four major issues with educational research, and responds to each issue via the use of a pragmatic approach to research. Pertinent to this research is how a pragmatic approach can solve the issue of false dualism (Pring, 2000, cited in Badley 2003) by appreciating the need to utilise both scientific and constructivist paradigms dependent on the context of research. I agree with this notion, as what the aforementioned authors

are suggesting is that pragmatism places the emphasis on the research and the impact of the research, and whatever methodology is required to achieve impactful outcomes should be implemented, including a mixed methods methodology. This is consistent with Rorty (1999), and my own beliefs as a researcher. Pragmatism offers a flexibility that other paradigms do not, and this often leads to methodological and the subsequent decisions about methods being restricted to a paradigm, which I believe is detrimental at times. This is not the case with pragmatism which offers more fluidity.

This is essential for the research within this Prof D, and one of the underpinning positives of pragmatism to educational research, as although much of the qualitative research concerned with perceptions and opinions would fall within constructionism, there may also be the requirement to use more scientific and quantitative methods at times, and pragmatism enables this without the research process becoming messy. For example, one study in this thesis collected data through a survey as the best method for gaining an initial understanding of the impact of Covid-19. The use of this method of collection and the subsequent analysis was not impacted by the pragmatic approach, which enables fluidity. Moreover, the outcomes of research in the view of pragmatism is distanced from the search for a truth or reality, and more aligned to outcomes and actions (Badley, 2003), which is fundamental to my view of educational research and my practice of using research to gain tangible outcomes. This is also crucial for the FE sector, so accessible research carried out in the sector enhances practices for the sector.

The importance of experience and social interactions are vital to the philosophy of pragmatism, with Dewey stating:

“The organism does not stand about, Micawber-like, waiting for something to turn up. It does not wait passive and inert for something to impress itself on it from without. The organism acts in accordance with its own structure, simple or complex, upon its surroundings. As a consequence the changes produced in the environment react upon the

organism and its activities. The living creature undergoes, suffers, the consequences of its own behaviour. This close connection between doing and suffering or undergoing forms what we call experience.” (Dewey, (1920) 1982, p. 129)

Evidently, what is true for a pragmatist is based on our experiences in the real world, as opposed to the Aristotelian view of truth existing ‘out there’ separate from us (Stark, 2014), thus epistemologically pragmatism is based on developing knowledge through experience, with each person’s knowledge unique as a consequence of his/her unique experiences (Kaushik & Walsh, 2019). Furthermore, pragmatism is less concerned with finding truth and reality (Rorty, 1999), and more concerned with finding solutions to real-world issues (Badley, 2003; Biesta, 2010). With reality ever-changing and in a constant state of revision, no absolute truth can exist (Almeder, 1986), although the benefits of pragmatism to this research enable a more flexible appreciation of the ontological position, due to the very nature of the world and beliefs in constant reconstruction, the links to that of constructionism (Bryman, 2016) are clear.

Criticisms of Pragmatism

One of the strengths of pragmatism is the fact it can be utilised with a variety of research approaches, but accordingly this brings with it issues from epistemological purists who are often alienated by researchers with different orientations (Onwuegbuzie & Leech, 2005). Accordingly, the alignment of a one-to-one relationship between epistemology and methods has likely impacted the dearth of pragmatic researchers (Ibid). Interestingly however, evidence has shown that the classification of qualitative methodologies by authors of research is not always accurate (Gueulette, et al., 2001). This suggests that on many occasions the researchers ‘go with the norm’ as a safe option and align to a mono-method research approach. Furthermore, there is an argument to state that due to the more established approaches to research being prevalent, leaders and supervisors of research will dictate these pathways to their students. Interestingly, the use of pragmatism within a programme of research ensured that more preparedness was acquired and a greater knowledge of

the possibilities and pitfalls of a range of methodologies was undertaken in the planning process of research (Clarke & Visser, 2019).

Some criticisms of pragmatism have been scathing, citing some representations as anti-philosophical and anti-intellectual (Haack, 1997), however this narrow view fails to appreciate that pragmatism is contextual, relevant and progressive in solving real-world problems (Kalolo, 2015). The criticism that pragmatism has lost touch with truth as correspondence to reality is not accurate (Hammond, 2013). ‘...post Popper, little dispute today that what we know is uncertain; it is fallibilism, if not always pragmatism, that has won out’ (Ibid, 614). In the context of this research, pragmatism offers the opportunity, much in the same way that action research does, for tangible change that empowers all stakeholders involved (Stark, 2014). Furthermore, pragmatism offers a clear epistemological basis for the use of action research, changing and progressing real-world educational issues through the interactions of agents and the environment (Hammond, 2013; Stark, 2014). Finally, the key determinant for the use of pragmatism is that it enables the most desirable methods to be used to gather data and answer the research question. Too often, researchers pay more attention to epistemology and methodology (Morgan, 2007), and evidently this is to the detriment of the research. It is vital for this research not to fall into this trap and become burdened in philosophical debates, and leave that to the discipline of philosophy itself. Pragmatism supports the uncertainty of epistemology and formation of knowledge (Hammond, 2013), whilst ensuring that tangible, real-world outcomes are realised through research (Dewey, 1910). Furthermore, and due to the complex nature of educational research, and the need to use a variety of methods to ensure the outcomes of research are worthwhile, pragmatism offers this great flexibility without the constraint to fit to one approach. Finally, the use of pragmatism is certainly not an ‘easy way out’ for researchers (Clarke & Visser, 2019).

Why Pragmatism – My Own Reflections

“Another way of making this last point is to say that we pragmatists cannot make sense of the idea that we should pursue truth for its own sake. We cannot regard truth as a goal of inquiry. The purpose of inquiry is to achieve agreement among human beings about what to do, to bring about consensus on the ends to be achieved and the means to be used to achieve those ends. Inquiry that does not achieve coordination of behaviour is not inquiry but simply wordplay”. (Rorty, 1999, p. xxv)

I have personally always found the design of research difficult, not through a lack of understanding but mostly from trying to fit my research to a given paradigm. Too often, the need to change or adapt my ideas for research in order to ensure I am compliant with the desired research methods has felt more of a hindrance than a help whilst planning and carrying out research. Logically, and in the fluid world we exist, having to ascribe to one approach does not suit my own research identity. Furthermore, the likelihood that one set of rules can encompass all aspects of the research we need to carry out again defies logic to me. The attraction of pragmatism is that it enables the research questions and outcomes to drive the research as opposed to the requirement of the research philosophy driving the research. As a researcher most of my work is very closely aligned to tangible outcomes that support and enhance practice within educational institutions. I am not a philosopher or an epistemologist, nor do I wish to be one. Research to me is important in giving tangible benefits that can be utilised by teachers in educational environments, as discussed previously, research without the teachers is like a football game without a football. The focus of my research will always be on the research, the outcomes of the research, and the impact this has on practice first and foremost above any research philosophy. That is not to diminish the importance of a research philosophy, methodology and methods in supporting research, but from my perspective the fluidity that pragmatism offers, and how it is situated to support real-world problems aligns with my own views. Furthermore, the fact pragmatism can be deductive or inductive, objective or

subjective, qualitative or quantitative, means it is perfectly suited to ensuring the most appropriate approaches are employed for all research.

Selecting the most appropriate research paradigm in social science research is clearly pivotal, as it impacts on the subsequent choices of methods, data collection and analysis. As discussed, the flexibility of the pragmatic approach, and the requirement to influence practice significantly influenced my decision to adopt the pragmatic approach. It is also useful to critically analyse the limitations of other paradigms.

The underpinning principles of pragmatism are the practical and pluralistic nature of knowledge and reality. The importance of understanding phenomena and seeking solutions in real world settings is at the core of pragmatism (Dewey, (1920) 1982; Rorty, 1999). However, the paradigm of positivism is rooted in empiricism, and is concerned with the use of the scientific method to establish facts, develop hypotheses in order to test and develop causal relationships. Positivism has its merits, and interestingly, was a paradigm I used in my first undergraduate degree – Sport Science. However, as I have progressed and developed a wider knowledge of research, the fact positivism is so dependent on objective truth and quantitative data (Comte, 1853/2009; Popper, 1959/1992); I have found limitations with this paradigm when the need of research is to explore multifaceted and context-dependent phenomena. This can often be the case in educational research. These limitations are amplified when the need of research is to understand the complexities of social and human behaviour, and the subjective experiences and meanings of individuals. Positivism as a paradigm is also deterministic in nature, overlooking human agency in developing and understanding the social world (Bryman, 2016). From my perspective, this links to how the research conducted in my first degree would be very much concerned with the need to measure the impact of one variable on another. Positivism was the perfect paradigm for this, although as I progressed into the world of educational research when studying a masters, I could see the need for a different approach.

In contrast with positivism, interpretivism does place an importance on understanding social phenomena from the perspective of individuals, with a focus on their subjective interpretations (Bryman, 2016). Initially as I progressed into educational research, this paradigm befits my new research intentions, and was in many respects the polar opposite of positivism, which I had become accustomed to implementing during my first degree. The paradigm does offer a way into peoples' 'lived experiences', and during my M Ed I developed an appreciation of interpretivism, how this links to research methods to enable the exploration into the views of participants, and why this was so important for the research I was completing at the time. As mentioned earlier, this paradigm was considered as I commenced my Prof D.

Interpretivism, like positivism has its criticisms, with these centred on subjectivity and a lack of generalisability. Within the interpretivist paradigm, contentions of reliability make establishing objective knowledge and truth, and causal relationships difficult (Denzin & Lincoln, 2005; Smith, 1974). Although, some argue that subjectivity is a vital component of qualitative research (Varpio, et al., 2020).

At this juncture, and following the earlier reflections on pragmatism, I believe it offers a middle ground between positivism and interpretivism, and importantly, it is the most appropriate when considered within the landscape of this Prof D. Remaining focused on the need for research to impact on practice, the flexibility in approach to choose the most suitable research methods to answer research questions, and the integration of qualitative and quantitative data collection and analysis methods make pragmatism the most appropriate for the needs of my research. Moreover, and in an ever-changing and fluid world, heightened by the pandemic, the adaptability and flexibility that pragmatism offers to me as the researcher is invaluable (Morgan, 2014), and is not offered through positivism and interpretivism.

A final point of consideration here is the extensive review by Sparkes (1992), who calls for a celebration of difference, and an appreciation of the value diverse research paradigms can bring to

the same field. In alignment with these principles, this methodology embodies the paradigm of pragmatism as an approach that offers the potential for both measures of empirical evidence and human complexity, thus, giving scope to carry out research that is both qualitative and quantitative, based on the needs of the research (Sparkes, 1992). As I reflect on the work of this author, one I first encountered during my first degree, I still believe their view on using quantitative research in alignment with the associated ontological and epistemological positions, and doing the same for the interpretivist stance is a good position to hold, i.e. appreciating the interplay between objective and subjective and aligning paradigms to the needs of the researcher. From my perspective, the need to find truth is not a goal for research (Rorty, 1999), and the acceptance of paradigmatic diversity (Sparkes, 1992) is welcomed. As a researcher, I am focused on implementing the most appropriate paradigm, methodology and methods for the research I am carrying out at that time, I have never believed that a researcher should only ever work from a positivist or interpretivist perspective.

To conclude, and to ensure I negotiate the 'marshy swamp' (Finlay, 2002) when designing research, a pragmatic philosophy will underpin it, enabling truths and new knowledge to be discovered to solve real-world issues in the world of education. This aligns to the need for this programme of research and what I believe research should accomplish for the FE sector, which is the outputs of research leading to a change and enhancement to practice. Pragmatism is fundamental to my needs as a researcher within the FE sector now and in the future.

Methodology – Action Research

Action research has become prevalent and utilised in educational research as a methodology for enabling people and organisations to develop (Grundy, 1994; Hien, 2009; Karagiorgi, et al., 2017; McTaggart, 1994). Furthermore, action research has the potential to change practice, the understanding of practice and the conditions of practice (Kemmis, 2009). One of the key aspects of action research is that it closes the gap between research and practice, which is vital for educational

research, ensuring that research is not 'done to' the sector. Too often, the perceived knowledge base of teaching is missing the voice of teachers which has been detrimental to the use and application of educational research (Ainscow, 2018; Cochran-Smith & Lytle, 1990). However, with the aim of action research to be grounded in practice-changing practice (Kemmis, 2009, p. 464), this is alleviated somewhat and is one of the positives of utilising action research.

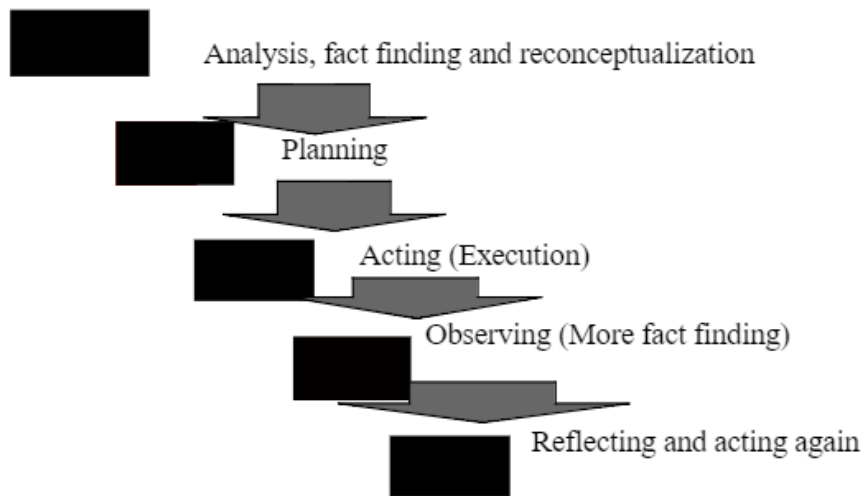
The theory and process for action research will be explained below, but continuing with the 'think aloud' (Pinnock, et al., 2015) insights into my thoughts during the decision-making process, action research became a perfect fit. Action research seeks transformative change through simultaneous research and action, which are linked together through critical reflection and iterative in nature. Additionally, the methodology aligns perfectly with the pragmatic research philosophy, and with my views on what research in the FE sector should achieve, that of modifying practices and approaches. Moreover, due to the nature of action research being continuous, reflection and evaluation continues to result in further actions through ongoing research. When considering methodologies, it became apparent that action research seemed well suited for this research and aligns with my beliefs and values as a researcher.

Although action research has many associated benefits, there are aspects of authentic action research that could be questionable for this thesis, especially Kemmis's (2009) notion of critical action research. For example, and although practice within institutions will benefit and evolve, the research does not fully posit itself in social and educational critique and reform, which are key elements of some approaches to action research (Kemmis, 2006; Kemmis, 2009) with an agenda of reform and empowerment (Kaushik & Walsh, 2019). However, and aligned to the pragmatic research philosophy underpinning this thesis, action research certainly meets the brief to impact on practice directly through the research completed as part of the Prof D. Moreover, and due to the nuances in approach and implementation of action research, certain variations discussed below are well suited to the research in this thesis.

Action research is underpinned by a cyclical process for supporting the positive change to practice, with problems studied systematically over a given time period (Mills, 2000). Kurt Lewin, often thought of as the founder of action research although this is contested (McTaggart, 1994), introduced the idea of a process of spiral steps, underpinned by a process of planning, action, and evaluation about the result of the action (Lewin, 1946; Lewin, 1952). However, and although that heuristic may be useful as a guide for some researchers and practitioners, following the spiral does not necessarily constitute action research (McTaggart, 1994), as 'action research is not a 'method' or a 'procedure' but a series of commitments to observe and problematise through practice the principles for conducting social enquiry' (McTaggart, 1994, p. 315).

Acknowledging the above is salient to understand and appreciate action research as more than a process, however, having a series of steps does act as a useful guide over a prolonged period of research, as is the case with this Prof D. The below is a depiction of Lewin's original model of action research, based on a spiral of action. Importantly, the process below will act as a simple heuristic throughout all the primary research studies to ensure that a clear focus is maintained on achieving tangible outputs following research that directly influences the practice within the domain the research was carried out.

Diagram 3 - Lewin's model of action research



Lewin's model printed in Dickens and Watkins (1999, p. 133)

The model above aligns seamlessly with the iterative nature of the research completed in this thesis. Although the overriding principles of action research are more than a series of steps (McTaggart, 1994) the process of research in the study can be aligned to Lewin's model (1946). The main data collection method within research study one involved the use of a comprehensive survey, and in many respects corresponds with the 'planning stage' of the action research cycle. The implementation of this approach also helped to gain a wider understanding of the needs and challenges of developing learning through digital means. In addition, the choice of using a survey for the first study was to gather a breadth of knowledge, which progressed to subsequent methods that permitted a greater depth to be gathered in the later studies, for example through the focus groups and expert interview. At this point, and following the large survey the data enabled the initial development of a digital programme, aligned to the 'action stage' of Lewin's model. The tangible outcome of this approach was vital and resulted in the first iteration of the digital development programme, with scope and opportunities for further iterations consistent with the action research approach (McNiff, 2017).

Although the steps only act as a guide, when progression to the second research study in the thesis which involved focus groups with advanced practitioners, it is fair to say I was keen to align this to the 'observing stage'. This research involved further critical examination through the use of semi-structured focus groups, and also underpinned the further refinement of the digital development programme. The data gathered was instrumental in enhancing the programme and wider initiatives, exemplifying the iterative nature of action research and how the observation stage supported subsequent actions.

My thought process for study three continued the funnelling approach that progressed from a large survey in study one, to a more defined approach in study two, to completing the research with study three, an expert interview. This was planned explicitly to allow a greater depth of findings to be obtained. It also aligns to the 'reflecting stage' (Lewin, 1946). Throughout this stage, reflection could be comprehensive and incorporate the entire research process, including the iterative improvements to the digital development programme and other outcomes (Miller & Rollnick, 2021). The expert interviewed was the final piece of the research jigsaw as part of the reflection stage, and offered a way of validating the work produced to this point and final refinements to the knowledge base and outputs of embedding digital and educational technology effectively to enhance learning.

I was keen to use the action research methodology for much more than a series of steps, but by aligning each study with key steps it was valuable in shaping my thought process in what the outcomes from each study would bring. Moreover, each stage of the research supported and informed the next, both from a design and output perspective. The methodology ensured each iteration of the digital development programme was in response to research findings, ensuring it responded to the needs of the institution.

A final point for consideration of the use of action research through my reflexive actions is that although it is possible to align the three research studies with Lewin's (1946) steps, the steps were also implemented as micro-stages within each study. With for example, the opportunity to

reflect following every primary study embedded. This caveat meant that although primary study one (chapter 4) would be more aligned to the planning and acting stages, primary study two (chapter 5) more aligned to deeper observing and fact finding, and primary study three (chapter 6) aligned to a deeper and holistic reflection process, micro stages of this happened in all the studies. This continual process supported each study to subsequently transfer into the next, ensuring a improvements were developed through cyclical and continual processes (Kemmis & McTaggart, 1988; Kemmis, 2009).

The collaborative nature observed in action research establishes an egalitarian approach to power in the process (Lingard, et al., 2008), further supporting the idea that the research is 'done with' and not 'done to' those involved. Kemmis and McTaggart (1988) also stress the importance of collaboration and reflection in action research:

'Action research is a form of collective self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices, as well as their understanding of these practices and the situations in which these practices are carried out.' (Kemmis & McTaggart, 1988, p. 5)

Reflecting on this aspect it was important for me to appreciate how my role may influence the efficacy of the action research approach within this thesis. Underpinning my outlook on educational research, especially within my sector (FE), the need to amplify the voices within the sector is imperative – research done by the sector for the sector. However, I have to be cognisant that within the institution where the research was carried out, I have a role that is classified as senior leadership, which could lead to challenges in terms of the approach to egalitarian power and collaboration detailed above. This was alleviated in the first instance due to my approach and relationships previously developed in my time at the college, with a large majority of staff knowing my underpinning philosophy in terms of educational practice and development. Although the college has a large cohort of staff, I have worked with a high number of these in terms of development, and I am confident through the feedback I have received that my values and principles as a leader are well

understood and respected cross-college. In fact, much of the positive developmental practice in place at the college has been led and developed by me, and based on notions of collaborative inquiry, for example Communities of Practice (Wenger, et al., 2002), Joint Practice Development (Fielding, et al., 2005) opportunities, and a range of innovative approaches to teacher development such as Teach and Research Meets. To further ensure that my role did not impact negatively on the implementation of action research, clear information will be discussed with the research participants so they understand my role in the research, their role in the research, and the underpinning principles of action research. This will be especially important in study two.

With the above in mind, I am confident that the impact of my role will not inhibit the collaborative element of the action research process. However, during the research if issues do become apparent there may need to be adaptations to ensure that the research is valid and maintains efficacy in terms of the methods employed.

Action research is a broad term and approach as a design to research with many scholars and authors offering variations in the approach to action research. Typologies offered in many cases have very similar terminologies, approaches and definitions, for example those offered by Berg (2001), Creswell (2005), O'Brien (2001) and White (1999). Technical, practical and critical action research were first posited by Carr and Kemmis (1986) and discussed further by Kemmis (2009). It is their notion of practical action research that is most aligned to the research carried out within this thesis. With practical action research, 'there is a sense in which the 'project' is also self-directed, but in this case the others involved also have a voice. The practitioner aims to act more wisely and prudently, so the outcomes and longer-term consequences of the practice will be for the best.' (p. 470). This differs from technical action research, which is more concerned with improving practice and outcomes and critical action research, which is emancipatory, deals with injustice and harm through correctional educational research (Kemmis, 2009).

In terms of the research completed as part of this Prof D, practical action research aligns well to that of pragmatism, and the requirement for this programme of research to improve and enhance the practice at a large educational institution through collaboration and social inquiry that extends the research beyond the 'researcher' and into the social community who the research impacts on, namely the staff at the large GFEC.

Action research has become a popular alternative to traditional research with Schmuck (2009) outlining four main differences between them. A vital consideration for the implementation within this thesis is how action research is more concerned with continuous improvement, the fostering of development and planned change and that the aforementioned are focused on local needs as opposed to the more universal approach of traditional research approaches. This aligns really well with the needs of the research within this thesis.

Action research as an approach and methodology has been used in many published studies, and a plethora of journals are based solely on action research, for example Action Research⁹, International Journal of Action Research (IJAR)¹⁰ and Educational Action Research¹¹. Practical action research has recently been used to evaluate the approach to research and subsequent publications within a higher education institution (Pidor, et al., 2017); study the impact of a two-year intervention to enhance the delivery of science, technology, engineering and mathematics (STEM) (Chen & Lin, 2019); and to focus on the development of new assessment approaches (Tang, 2022). Like the research in this thesis, the aforementioned examples exemplify the cornerstones of practical action research as a clear project that is collaborative for all stakeholders with an underpinning principle to improve an aspect of practice.

⁹ Action Research, a SAGE journal can be viewed here: <https://journals.sagepub.com/home/ARJ>

¹⁰ International Journal of Action Research can be viewed here: <https://www.budrich-journals.de/index.php/ijar>

¹¹ Educational Action Research can be viewed here: <https://www.tandfonline.com/journals/reac20>

Specifically related to the FE sector in England, the Education and Training Foundation (ETF) have exemplified the use of action research to support and develop all practitioners, the practice across the sector and to support the development of research networks. They released an action research guide in 2021 (Education and Training Foundation, 2021) detailing the germane ideologies and approaches to action research. More importantly, within the report many case studies of action research were shared, emphasising the many ways in which action research have been used within the sector. Additionally, the guide is supportive for practitioners and attempts to demystify the notion of educational research. Finally, and referred to in the guide, the ETF have led Outstanding Teaching, Learning, and Assessment (OTLA) programmes over a prolonged period of time based on action research.

For the purpose of the research in this thesis, action research is embedded to ensure that tangible improvements are developed following the research and subsequently integrated into the practice of a large GFEC. The classical principles of action research – planning, acting, observing, reviewing and acting again will support me as a researcher to keep a simple process for completing the various stages of research, however, this is in no way diminishing the detail and complexities of the action research approach (McTaggart, 1994). Moreover, the chosen typology – practical action research (Carr & Kemmis, 1986; Kemmis, 2009) – supports the specific needs of the research within the Prof D, and the requirement to have collaboration embedded into the research to develop and enhance localised practices (Schmuck, 2009). In conclusion, practical action research aligns to my values as a researcher, the requirements of the Prof D, my employer’s needs, and that of the action research approach.

Research Design – Case Study

In order to obtain the rich data required and in-line with the research strategy, a case study design was implemented. Many definitions have been offered on what constitutes a case study with reoccurring themes evident. For Yin (2009), a case study is an empirical inquiry and investigates

phenomenon in real-life settings. Yin (2012) highlights the fact case study research ‘assumes that examining the context and other complex conditions related to the case being studied are integral to understanding the case.’ (p. 4). Stake (2006), conceptualises that a case is a noun, not a verb. In this way, a case could be a thing or an entity. Thomas (2016) also uses the term ‘thing’ to depict research that is interested in the ‘thing’ as a whole. Newby (2014) has a similar view of a case being ‘a detailed analysis of an individual circumstance or event...’ (p. 53). Consequentially, and related to the needs of the research within this thesis, a case study is understood to be a detailed examination of phenomena in its real-life setting and aligns with Stenhouse’s (1985) vision for educational case studies where the understanding of educational action is the key driver, as opposed to social theory or evaluative judgements (Bassey, 1999).

Many types or characterisations of case study research are evident, and this can make both defining and assimilating into one coherent framework difficult (Bassey, 1999; Simons, 2009). Yin and Campbell (1989) posited exploratory, explanatory and descriptive approaches to case study research, with Stake (1995) introducing intrinsic, instrumental and collective methods. Other variations have subsequently followed and been developed (Ebneyamini & Sadeghi, 2018).

Importantly, with the three primary research studies within this thesis all varied in terms of research outcomes, methods, data collection and analysis, the vital aspect when implementing a case study design was obtaining rich and revealing insights (Yin, 2012) for each study by selecting the most appropriate approach for the purpose of each study.

The Case – The Sheffield College

The in-depth investigation of phenomena as part of the case study design throughout this thesis will be completed at The Sheffield College, a GFEC. The Sheffield College is the largest GFEC in South Yorkshire and offers a wide and diverse range of programmes to the communities it serves. Like many GFECs, this diversity is part of the magic of the sector, with courses supporting students from pre-entry level all the way to degree level to transform and shape their futures. This is

emphasised with over 500 learning programmes offered to approximately 14,000 students per year. The college has five main sites and employs over 1,300 staff in curriculum and support roles. The subsequent requirement of the research and following my own reflections and need for the research to be ongoing throughout to permit action research cycles to develop and enhance practice led to the decision to adopt a case study design. Evidently, the need to see the impact of the research overtime in one institution through three primary research studies led to a case study being the most appropriate design.

In recent times, the college has encountered indifferent reports and visits from Ofsted. This is emphasised with full inspections in January 2016, January 2018 and September 2019 resulting in the college being classified as requires improvement¹². The now established new leadership team and structure put in place at the college have a primary objective to ensure that the next full inspection from Ofsted leads to an improvement to this classification. This visit could happen at any point up to Easter 2023, under the latest iteration of the Ofsted inspection process known as the Education Inspection Framework (EIF)¹³.

Following the Further and Higher Education Act in 1992 and the subsequent Education (Further Education Corporations) Order in 1992 (Patten & Hunt, 1992), The Sheffield College was established. In the inspection report released in July 1996 (inspection occurred between May 1995 to March 1996) the inspectorate stated:

‘The Sheffield College is the largest college within the further education sector in England. It was formed on 1 September 1992 by the amalgamation of six tertiary colleges, controlled by the Sheffield Local Education Authority (LEA): Castle, Loxley, Norton, Parkwood, Parson Cross and Stradbroke. These now serve as the main centres of The Sheffield College.’

¹² The Sheffield College’s recent Ofsted reports can be viewed here:

<https://reports.ofsted.gov.uk/provider/31/130531>

¹³ The latest version of the EIF for the FE and Skills sector is here:

<https://www.gov.uk/government/publications/further-education-and-skills-inspection-handbook-eif/further-education-and-skills-handbook-for-september-2022>

(Inspectorate, 1996, p. 2)

Interestingly, the inspection report was very positive, with the prominent measure of the time – Aspects of cross-college provision – graded 1, meaning the provision had many strengths and very few weaknesses (Inspectorate, 1996). However, shortly after this the college were described to be in a funding crisis, with a change to the national funding policy partly to blame (Times Higher Education (THE), 2000).

Although there are many micro factors that will contribute to the improvements at the college to ensure a positive Ofsted inspection, a vital aspect of this will be the improvements to teaching and learning through the enhanced use of technology, something that the college are lacking and a direct priority of the Chief Executive and Principal. This is also heightened due to Covid-19 and the increased reliance on the use of technology at the current time and the impact this will have in future years. Subsequently, it places a huge emphasis on the research completed as part of this Prof D to have impact both theoretically but also in practice, and within the education sector that means two key outcomes; an improvement to outcome data and to the college's Ofsted status.

Data Collection, Analysis and Limitations

Data collection methods are simply the practical tools implemented to achieve the aims and objectives of research (Than & Thanh, 2015). The methods chosen and subsequently implemented for all three primary research studies in this thesis were selected following careful deliberation, and to ensure that data was obtained in the most appropriate way, in correspondence with the research philosophy, methodology and design. As discussed previously, pragmatism aligns well to my outlook on what research should achieve and do, by focusing on the outcomes of research in solving real-world issues, as opposed to truth. It is also more fluid and flexible than other approaches, permitting the use of a wider set of data collection and analysis tools. It offers more freedom than both positivism and interpretivism that are often more restrictive and aligned to a set methodology and

range of tools. The data collection and analysis methods for each of the three primary research studies are detailed below.

Research Study One (Chapter 4)

Due to the need for this research to be carried out in quick response to Covid-19, and the research forming part of a bigger project, a survey was used as the collection tool. This also enabled a large cross-section of participants to be sampled in the data collection, which was key to understanding the views of all delivery staff across the college used in the study. It is accepted that survey data is thinner than interview data in most cases (Braun & Clarke, 2013), but the key requirement for this study was a larger sample size of completion, as an early indication of staffs' experience of distance and online delivery.

The survey was very clear and straightforward for participants to follow, and tested on a small group of pilot respondents to ensure no errors were present (Stringer, 2014). One small amendment following the pilot was to write virtual learning environment on the first occasion it was used on the survey. Initially, it was considered that all respondents would know what this abbreviation meant but the decision was taken to write it in full following the pilot (see appendix 1).

The survey questions were developed with a mix of fixed, dual, and rating responses to enable clear data to be gathered (Stringer, 2014). Although this limits the opportunity to explore participants' views and attitudes on particular topics (Smith, 2018), this was not a requirement of this research study and further depth and detail will be explored in the subsequent research studies. Questions where a rating response was used was based on a four-point scale, strongly agree, agree, disagree and strongly disagree. Although much research has been carried out on the most appropriate way of implementing Likert scales and Likert scale responses, arguments can be made on the most appropriate formation of a scale. For example, offering a midpoint can be largely based on the researcher's preference (Garland, 1991), and survey creation should largely depend on what the designer believes to be the most important to answer the research questions (Chyung, et al.,

2017). Clearly, an appreciation of research is required when designing the scales to ensure reliability and validity, however, autonomy in creation to develop scales aligned to the research must also play a part. Debates surround the amount of response ratings (Chyung, et al., 2017; Dolnicar, et al., 2011; Taherdoost, 2019), the use of a midpoint (Garland, 1991; Tsang, 2012) and how data can be analysed following the use of a Likert Scale (Joshi, et al., 2015; Mircioiu & Atkinson, 2017; Norman, 2010; Sullivan & Artino Jr, 2013; Wadgave & Khairnar, 2016). Taking into account the above research, and the requirement for the survey to give the most useable data at the college, a four-point scale was primarily used with no mid-point on scaled responses, as respondents were comfortable with the subject and there was a requirement to have a direction of opinion (Johns, 2005).

Finally, a cross-sectional survey design was used to gather the views and opinions of participants following the first three months of remote and online delivery (Ibid).

Sampling & Participants

Probability sampling was used in the form of stratified random sampling, in order to generalise between the sample and the population. Tests of significance can only be used through probability sampling as they can provide an estimate that the 'sample result is due to sampling error.' (Vaus, 2002, p. 171), and this was a requirement of the study. This is not the case in non-probability sampling as some members of the target population have a greater or lesser chance of being selected (Smith, 2018).

Stratified random sampling was used in order to ensure that the sample was representative of the population, in this case the faculty structure at the college. This meant that:

- 24% of respondents were from the Faculty of Engineering, Construction and Technology
- 15.7% of respondents were from the Faculty of Land-based, Sport, Protective Services and Business
- 13.4% of respondents were from the Faculty of English, Maths and ESOL

- 12.2% of respondents were from the Faculty of Health and Science
- 12.6% of respondents were from the Faculty of Creative and Design
- 7.1% of respondents were from the Faculty of Higher Education and Academic Studies
- 10.6% of respondents were from the Faculty of Inclusion
- 4.4% of respondents were from the Faculty of Apprenticeships

The approach to sampling was accurate in terms of ensuring the sampling frame was an accurate portrayal of the representative population, in this case teachers across the faculties. For example, the Faculty of Higher Education and Academic Studies represents 6% of the total delivery population, and is represented at 7% in the sampling. One way of minimising sampling error is to use a large sample size (Vaus, 2002) and that was factored into sampling for this study. This led to a large sample being chosen, and even mitigated against bias from those who did not take part in the survey. In total, 254 respondents engaged with the survey, which equates to 39% of the total population. Furthermore, the degree of diversity within the sample was only represented by the faculty a teacher operates in, again meaning diversity was low which reduces the chance of sampling error (Vaus, 2002). The large sample used, and the relatively small population diversity, leads to confidence when making generalisations across the data set.

Data Analysis & Display

Data obtained from the survey was ordinal, meaning descriptive data such as means and standard deviations were not the most appropriate form of analysis, as the average of agree or disagree across the data set does not tell us anything (Sullivan & Artino Jr, 2013). However, the use of percentage as a frequency measure of response is certainly a useful starting point for data obtained for each question. Furthermore, and due to the ordinal nature of the categories, displaying the data graphically for each question enabled a clear visual representation for analysis and discussion (Walker, 2010).

Although quantitative research does benefit from the use of inferential statistics to establish how representative the sample is of the wider population (Vaus, 2002; Walker, 2010), this was not a requirement of this research due to the large sample used in the data collection. Moreover, the descriptive statistics used gave the required level of analysis, and as White and Gorard (2017) caution, often inferential statistics are used for the wrong reasons and to the detriment of the research and subsequent analysis. In this case, the sample size and analysis would only be confused by p-values, standard errors and confidence intervals (White & Gorard, 2017).

Limitations and Trustworthiness

As discussed, to mitigate against sampling errors a large sample drawn from the population has been used. Furthermore, the design and structure of the survey was very easy to follow and understand, and no abbreviations were used that may confuse those completing the survey. The use of descriptive statistics also enabled the data to be analysed and represented in the most appropriate way.

Research Study Two (Chapter 5)

Data was collected through two focus groups, totalling eleven participants from one large GFEC in the north of England. The participants were selected through a purposive sampling strategy ensuring that they shared a similar knowledge and experience of developing online practices, thus giving meaningful insights and new knowledge associated with the research questions. In this way, participants were handpicked due to their specific characteristics (Cohen, et al., 2017) that were pertinent to the research questions. In total, the eleven participants had completed 220 supportive online observations and close to 350 coaching sessions throughout the academic year. A guide for the focus groups was produced (see appendix 2) in advance to ensure that certain topics and potential avenues of investigation were covered (Kvale & Brinkman, 2009), but the focus groups

were very much semi-structured in nature, ensuring the experiences and perceptions of the participants were prominent throughout (Mears, 2017).

Focus groups were carried out online due to the restrictions in place during the Covid-19 pandemic. This modality actually brought many benefits (Falter, et al., 2022), making it easier for participants to attend, for the meeting to be planned, recorded and subsequently transcribed. In terms of methodological reflexivity, the use of this modality is something that I will certainly utilise as a researcher in the future, for the benefits discussed. It would also be a much better method when approaching an expert for an interview, with them more likely to agree to something that is less time dependent and impacted by geographical issues (Kite & Phongsavan, 2017). Finally, there is clearly a cost and time saving element to completing focus groups and interviews online, with the considerations of software key to successful implementation (Ibid).

All participants had completed consent forms and through the online conferencing tool had their cameras on at all times during the focus groups. Through the conferencing software both focus groups were recorded in full, with the first focus group running for just over one hour and 10 minutes and the second focus group running for just under 50 minutes. The recordings of the focus groups were kept in a stored file in the cloud that only the researcher had access to. The focus groups were transcribed verbatim with clear delineation of what was said and by which participant, this was made easier due to the video conferencing tool, which highlighted the main speaker(s) throughout. Data was then analysed through Braun and Clarke's (2006; 2013) approach to thematic analysis (TA). Due to its flexible nature the approach to analysis supports the research philosophy and methods, as it is not bound to any particular methodological approach and is not a methodology in itself (Braun & Clarke, 2013). Moreover, TA also made it possible to create themes across the sample size as opposed to interpretative phenomenological analysis (IPA), which has the 'dual focus on individual cases and themes across cases' (Braun & Clarke, 2013, p. 183).

Thematic Analysis Worked Example

TA suited this study as a flexible method for analysing data and patterns across the qualitative data set (Braun & Clarke, 2022) I had gathered.

The first phase of completing TA on the data obtained in the focus groups was to become familiar with the data – the Familiarisation Phase (Braun & Clarke, 2006; Braun & Clarke, 2013; Braun & Clarke, 2022). Reflecting on this, I found initially this to be quite straight forward and, in many respects, easy. Other than the vast amount of time to listen, transcribe, read and re-read the data collected from the two focus groups, this part of the familiarisation phase was unproblematic. As I reflect now, I had become so immersed in the data that I felt I could remember large elements of the conversations that had occurred in the focus groups without watching the recordings or having the transcriptions in front on me.

It was in the next stage of this phase where I began to struggle and at times hit the proverbial wall. Initially, I found it difficult to engage critically and reflexively with the data, acknowledging that ‘I’ play a fundamental part in the process (Braun & Clarke, 2022). For example, in my first degree, which was based more on quantitative analysis, I found it easy as the analysis simply followed a series of steps that would lead to an output of results. Even in my previous use of TA first proposed by Braun and Clarke (2006), where I analysed data as part of my M Ed, I felt that I followed the six steps more as a process, from afar trying to arrive at themes. During this Prof D, and following their own revisions of TA to encompass more reflexivity (Braun & Clarke, 2019; Byrne, 2022) and make explicit the role of the ‘self’ in the analysis, it was challenging to accept I was a key part of the data analysis, as opposed to someone simply doing the analysis as a set of steps, that could have been carried out by anyone. I recognised through further engagement with Braun and Clarke’s work (2019; 2022; 2023) that there was a large reflexive element to TA, now termed Reflexive Thematic Analysis (RTA).

As part of the analysis, and to support my approach to conducting RTA, I also utilised wider research and commentary on reflexivity. I found revisiting the work of Varpio, et al., (2020) useful in

combination with RTA, to really understand how I needed to be aware of my positionality and how this could influence my analysis. I became more comfortable in working through this stage of phase one, and asked questions such as 'How does the person make sense of whatever it is they are discussing? Why might they be making sense in this way? (Braun & Clarke, 2022), whilst also questioning myself throughout the analysis by asking, 'Why/how am I reacting to the data in this way? 'What is my interpretation based on? Do any bias exist? (Braun & Clarke, 2022; Varpio, et al., 2020).

At this point I became comfortable with all aspects of phase one, and through this became ultimately familiar with the data. I had immersed myself in the data, and then through the processes discussed above engaged critically with the data.

Towards the end of phase one, I naturally felt myself moving into phase two – Coding. Reflecting now, and due to the additional time taken in phase one, I felt that at this point the analysis started to flow, and it was easier to find segments that were interesting, relevant and provoking and could be aligned to codes (Braun & Clarke, 2022; Byrne, 2022). It was time consuming due to the amount of data, but as I reflect now, elements of this phase were enjoyable, as the analysis started to take shape.

Throughout this stage, I also developed my knowledge of the typologies of thematic analysis, and reflect positively on my progress from my M Ed to this Prof D, where my implementation of thematic analysis has developed considerably. At this point, I further utilised Braun and Clarke's (2019; 2022; 2023) guidance, which supported me to understand that the form of TA I was adopting was RTA. This also made sense in relation to my research philosophy, with other approaches to TA susceptible to links with (post)positivism (Braun & Clarke, 2023). Reflecting on the comments in phase one, this is why the familiarisation step felt different in this analysis as part of the Prof D compared to my previous use when completing my M Ed. In this analysis, I was part of the analysis, needing to understand my positionality and reflexivity. In my M Ed, I did employ more of a step-by-

step approach, likely conflating Braun & Clarke’s (2006) approach, which they themselves found in their own research when analysing the use of TA (Braun & Clarke, 2023). What is pleasing is the RTA embedded here was done in accordance with the latest guidance, and appreciative of the role of ‘me’ the researcher in the coding. The figure below shows how codes were developed from the data.

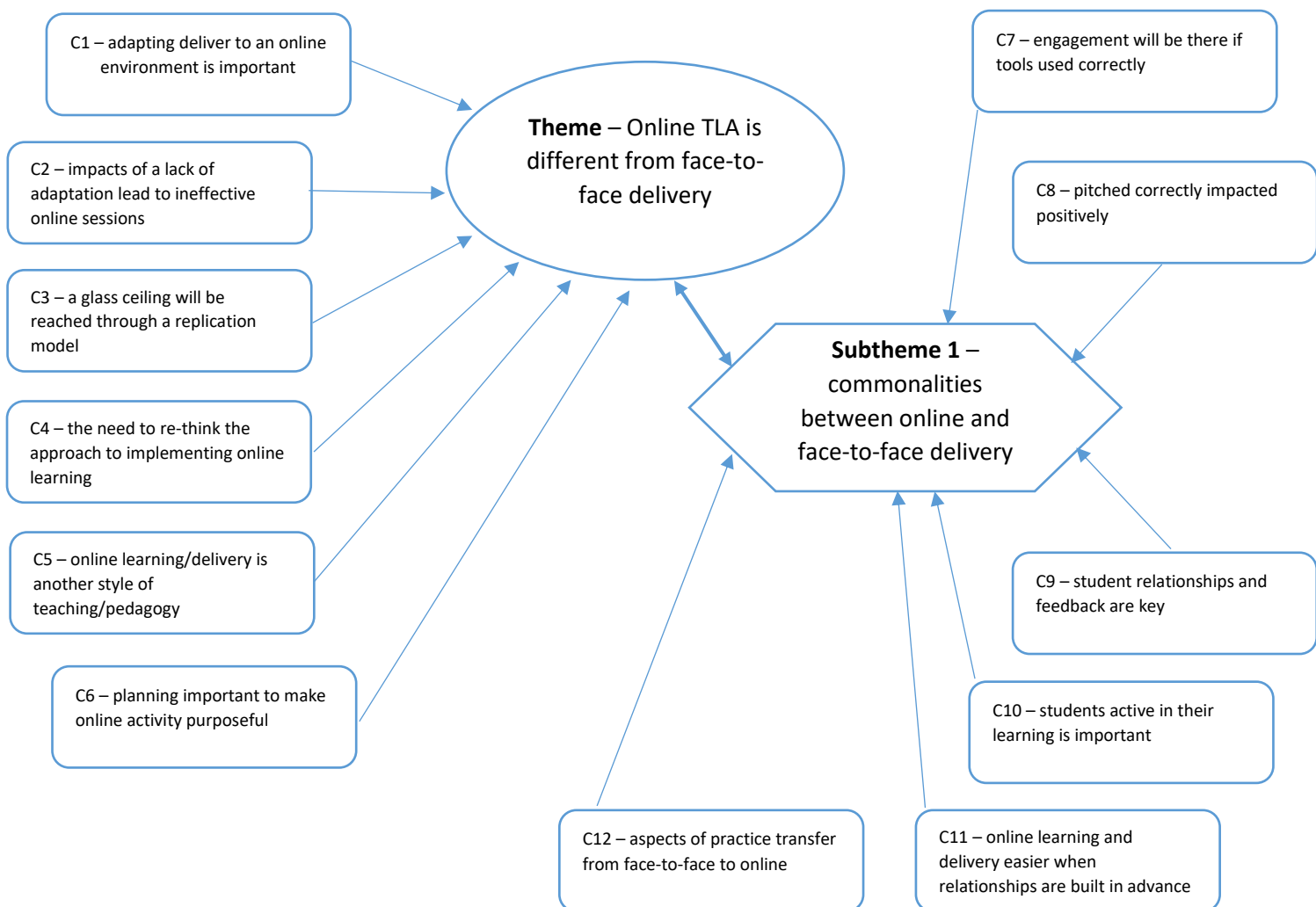
Figure 1 - Generating Initial Codes - Example

Narrative	Code
<p>‘It’s about the structure, and trying to, I guess meet all the professional standards of what an actual lesson is about, but not just like lifting what we do in a physical classroom and plonking it online, it’s about adapting it. The best teachers, yeah have the same kind of structure and progressive learning that you would find in a classroom but they haven’t just taken a typical lesson plan and are trying to re-do it in an online learning environment, they’ve adapted the resources and assessment for learning strategies...’</p> <p>‘Well designed, well structured, but also adapted for this very specific environment that we are working in at the moment.’</p>	<p>C1 – adapting deliver to an online environment is important</p>
<p>‘You can tell when it is ineffective can’t you? Because the kind of activities that you would do verbally haven’t been adapted for the online classroom and you do have still, the teachers who just ask the questions and sit there and ask and ask and ask, and are still not recognizing that students aren’t responding and haven’t tried to adapt that to online.’</p>	<p>C2 – impacts of a lack of adaptation lead to ineffective online sessions</p>
<p>‘I think that if we were to take online lessons, and we move what we do traditionally in a classroom online, I think we can only have a limited amount of success with that. I think there will be a glass ceiling that we will reach with that.’</p>	<p>C3 – a glass ceiling will be reached through a replication model</p>
<p>‘I just feel that we need to re-think what online lessons are. I think we have to kind of move away from this idea that we are going to move what we do in a classroom online and it’s going to work like that.’</p>	<p>C4 – the need to re-think the approach to implementing online learning</p>
<p>‘I probably liken it to another, sort of like teaching style, another pedagogical approach. I’m a sports teacher, I liken it to how do I deliver in a classroom to how do I deliver in a fitness suite or a sports hall, they are very different...I now think that online learner becomes another style of delivery and I that becomes as important as the other two if we are to move forward with this online delivery style.’</p>	<p>C5 – online learning/delivery is another style of teaching/pedagogy</p>
<p>‘...making sure it’s purposeful for online activity, not just what you would do in a classroom and let’s try it online so that planning is there.’</p> <p>‘You can always tell the sessions that are really well structured. I know we are not trying to replicate the classroom, but the best sessions have still had that really good structure.’</p>	<p>C6 – planning important to make online activity purposeful</p>

'It's engagement I see, the tools the staff are using. How the staff are delivering the applications online and how the students are participating in the tasks.'	C7 – engagement will be there if tools used correctly
'The teacher had pitched it correctly so all the students felt engaged and they all felt they had a valid voice.'	C8 – pitched correctly impacted positively
'Knowing the student and giving the student that individualised feedback'	C9 – student relationships and feedback
'It's about students being active in their learning...when they are and active and engaged in it, and the students have something to do rather than being passive, I feel that is positive is consistent in the good sessions.'	C10 – students active in their learning
'There's been a common thing where staff have said they've felt their online learning experience has been, not better, but easier with students they have got a relationship with. So, they might have taught them in the classroom or they teach them for quite significant periods. And they said if they have not got the relationships, if it's just once a week they are seeing them, it's not that the lesson is not as good, it's just their feedback to me in general is that has been harder, to maybe sometimes build those relationships.'	C11 – online learning and delivery easier when relationships are built in advance
'Now there are still aspects that transfer across. Questioning strategies transfer across, stretch and challenge, differentiation. All the key things that underpin good TLA, carry across. But there are different ways and means of going about that (online delivery). I think we need to start treating online lessons as separate to classroom and practical sessions...I think we need to spend as much time going over online learning as we do classroom learning and practical activity learning.'	C12 – aspects of practice transfer from face-to-face to online

From the codes, it became easier to start generating themes, which capture patterns of meaning across a dataset (Braun & Clarke, 2022). As I had been so thorough in the previous two phases, this phase – phase three – Generating Initial Themes – happened at pace, or least it felt that way from my perspective. This phase of analysis was enjoyable, and I relished the metaphorical process of working as a sculpturer with a piece of marble, rather than an archaeologist digging up buried treasure (Braun & Clarke, 2013). This is an important distinction to make and underpins much of my learnings through the reflections carried out during this Prof D. It underpins the notion of the 'self' or 'researcher' working with the data, in acceptance that I had to play an active role in deciding on the patterns of meaning across the dataset (Byrne, 2022). Throughout this process, I continued to ask myself questions such as, 'Does this theme capture something meaningful? Is it coherent, with a central idea that brings the codes together?' (Braun & Clarke, 2022). Figure 2 below gives an example of this process.

Figure 2 - Generating Themes - Example



As the analysis progressed to phases four and five, in truth it felt like the hardest and most time-consuming aspects of the analysis had been completed. Interestingly at this point, I still felt so familiar with the data that I could almost recite verbatim large elements of the focus groups.

I spent time contemplating some questions, for example, ‘Is this a theme or a code? What is the quality of the theme? What are the boundaries of the theme? (Braun & Clarke, 2013; Braun & Clarke, 2022). One key reflection at this point was how I was reflexive in my role as a researcher, contemplating personal, interpersonal, methodological and contextual reflexivity (Varpio, et al., 2020). I believe this balanced my role in the RTA as discussed by Braun and Clarke (2019; 2022;

2023) but further enhancing my positionality in the research through being reflexive in contemplating my biases.

Within this aspect of the analysis, I was ensuring contemplating and reviewing the themes to be certain that they represented something important, had clear boundaries and a depth and richness to quantify as a theme. In the example given in figures one and two above, I reflected on the theme considerably, to be sure the data items and codes were truly represented by the theme (Byrne, 2022). This example was interesting, because the theme and subtheme could be construed to contradict; however, as I revisited the data and codes numerous times, it became evident that this theme and subtheme was a true representation of the initial codes. These debates further emphasised to me the importance of letting go of a standardised approach to RTA, in the knowledge that I do play a role in the analysis, and in some ways shape the analysis. That is not to say that efforts to ensure validity, reliability and trustworthiness were not made, as they were, and in detail, but it is the appreciation of RTA as a method of analysis.

The final phase of RTA is phase six – The Write Up. This theme is in the results and discussion section of chapter five. Due to the detail of the aforementioned phases, the aim of phase six in chapter five is to almost tell the reader a compelling and interesting story (Braun & Clarke, 2022). In the discussion, I use some of the salient quotes to support this storytelling, but also offer the reader an evidential basis for the analytic claims made, and the opportunity to evaluate the validity of the claims in relation to the actual source data (Braun & Clarke, 2022; Byrne, 2022).

Trustworthiness

It is accepted that the need to take every measure possible to ensure trustworthiness (Shenton, 2004) is key to qualitative research. This led to the four criteria defined by Guba (1981) being adhered to, for example, producing a detailed methodology and ensuring that findings were constructed from data and not the researchers' own predispositions (Shenton, 2004), although there is acknowledgement that the reflections of the researcher will develop the themes (Braun & Clarke,

2006; Braun & Clarke, 2013). However, and although these measures were taken, there are still limitations in the research. Firstly, the nature of this research captured the perceptions of the eleven participants through focus groups and subsequent reflections and member checking processes, however, it is appreciated that these perceptions are at that point in time and may alter in the future. Moreover, the sampling method did ensure that participants were chosen due to their experiences related to online practices, but this means that in no way does this make the findings here generalisable to the wider population, although it is hoped these themes will give a good starting point for others on a similar journey. Although this is a limitation, it is also a strength of qualitative research as opposed to quantitative and positivist approaches. Furthermore, this aligns to my outlook as a pragmatic researcher in applying the most appropriate paradigm that results in tangible research outputs, not the search for truth. Generalisability will always be questioned in qualitative research, hence why I have mentioned and acknowledged it here. However, the need to interpret and construct meaning is the power of the qualitative approach (Braun & Clarke, 2013; Bryman, 2016; Braun & Clarke, 2022) and was fundamental in collecting data and then making meaning from this data that resulted in improvements to practice. It is also worth noting here that strong personalities were planned for to ensure that the opportunities for discussion were there for everyone in the focus groups. In addition, the planning of the focus group was astute to ensure the facilitator, in this case me, could reduce this limitation.

Research Study Three (Chapter 6)

Theory-Generating Expert Interview Method

This study was underpinned by the theory-generating expert interview method, with Professor Paul A. Kirschner the expert. Although the researcher's judgement on who can be classified as an expert is important for their research, more thought is required when depicting experts and non-experts, ensuring that the central aspects of the expert interview method are distinguishable from other interviewing techniques (Meuser & Nagel, 2009). Clearly, the decision to

establish an individual as an expert cannot be arbitrary, and the researcher must be thoughtful on the purpose and use of the expert in relation to their intended research outcomes.

Establishing how experts are defined as part of this method is vital. For Meuser and Nagel (1991) 'experts can be defined as persons who are responsible for the development, implementation, or control of a solution, or persons who have privileged access to people or decision-making processes' (Döringer, 2021, p. 267). This aligns with the view of Hitzler, Honer and Maeder, (1994) who cite 'institutionalized authority to construct reality' as paramount in being recognised as an expert (Meuser & Nagel, 2009, p. 19). Moreover, and crucial for this research was the understanding that the expert knowledge gained from the interview with Professor Paul A. Kirschner would create new knowledge through 'analytic construction' as opposed to gaining 'special knowledge' that can simply be 'dug up like a buried treasure' (Bogner & Menz, 2009, p. 73). This is extremely important for this study, which is part of a research thesis based on the philosophy of pragmatism, as the end goal of each study and the thesis as an entity is to find real world solutions to real world issues (Badley, 2003; Biesta, 2010). The importance of the expert interview will be realised following analytic construction during the data analysis, meaning the interview itself is only one aspect of the formulation of new knowledge, which in this case will be used to inform tangible outputs in the researcher's given context. In this way, the expert interview aligns perfectly with pragmatism as a methodology, and with action research as a design, enabling the interactions of agents and the environment to change and progress real world issues (Hammond, 2013; Stark, 2014).

The typology of expert interview employed was that of the systematising expert interview, as defined by (Bogner & Menz, 2009). This approach, one of three defined, was implemented and placed the expert 'as a guide who possesses certain valid pieces of knowledge and information, as someone with a specific kind of specialised knowledge that is not available to the researcher' (Bogner & Menz, 2009, p. 47). Consequentially, this type of interview enabled access to the special

knowledge that experts have about social facts (Gläser & Laudel, 2004) and in this study, technical knowledge, which relates to highly specific knowledge in a given field (Bogner & Menz, 2009) was vital to meet the aims of the study and thesis. Finally, an important consideration concluded by Bogner and Menz (2009) was the call for flexibility in approach to the expert interview, with no single unified rules for implementation. This aligns to this study and the thesis as a whole in ensuring that the most suitable methods were used for the research.

As with all the primary research within this thesis, new knowledge gained from the use of the expert interview will be underpinned by pragmatism and action research. This is to ensure that when looking at the bigger picture of the thesis research, the new knowledge gathered in this study will be used to reshape and enhance current thinking and result in practical outputs within the research setting.

Data Collection

The interview with Professor Paul A. Kirschner was conducted online, recorded verbatim and then transcribed in full (see appendix 4). The interview was stored in a folder only accessible to the researcher. On the basis of this study building on previous studies in the thesis, and in accordance with the systematising expert interview approach, an interview guide (see appendix 5) was produced to enable themes to be explored, but not restrict avenues of discussion that may arise. In many respects, this creates an interplay between forms of deductive and inductive thinking for the benefit of the research (Witzel, 2000). For example, there is greater focus on deductive aspects through the defined interview guide, which is based on findings from the preceding research studies. However, and in the nature of the systematising expert interview, there is inductive mechanisms apparent through the ‘...analytic reconstruction of the subjective dimension of expert knowledge’ (Bogner & Menz, 2009, p. 48) following the interview and as part of the analysis.

Data Analysis

As with the previous study, and due to its alignment to both pragmatism and the systematising expert interview approach, Braun and Clarke's (2006; 2013; 2022) reflexive thematic analysis (RTA) was used for data analysis. Due to the flexibility of the approach in terms of research paradigm and methods, and as it is not a methodology in itself, it is the most appropriate method of analysis for this study. Braun and Clarke's (2006; 2013) six steps include familiarization with the themes, initial coding, generating themes, reviewing these themes, defining the themes and then writing up the data. The analysis was conducted as detailed in chapter five; please refer to the section – Thematic Analysis A Worked Example – on page 84.

This supported the analysis in this study and the expert interview approach, enabling 'analytic construction' during analysis. Interestingly, Bogner and Menz (2009) use the analogy 'dug up like a buried treasure' (p, 73) and Braun and Clarke (2013) use a similar analogy, viewing the TA researcher as a sculpturer working with a piece of marble, opposed to an archeologist digging in the dirt for buried treasure.

Trustworthiness

To ensure trustworthiness, processes of member checking and member reflection were implemented to enhance internal validity and the accuracy of the interview statements and subsequent analysis. Member checking involves the researcher checking with the participants that an accurate account has been developed following data collection, including the accuracy of the themes created (Creswell, 2005; Lincoln & Guba, 1986). To establish that the process was more than something to tick off a research checklist (Hallett, 2013) the researcher confirmed that both the transcript and subsequent data analysis were returned to the interviewee, in this case Professor Paul A. Kirchner. This was to guarantee the accuracy of the verbatim transcript (Birt, et al., 2016) and subsequent analysis, ensuring 'interpretations are fair and representative' (Creswell, 2005, p. 252). Importantly, and due to Professor Kirchner's first language and accent, several key changes were

made to the verbatim transcript. In addition, the process for review of the actual analysis was more aligned to Braun and Clarke’s (2013, p. 285) notion of member reflection, giving opportunity for ‘reflexive elaboration’ of the analysis, as opposed to checking if the researcher ‘got it right’. This was a key decision as it was necessary to ensure the research was developed from my interpretations of the interview and analysis, a process led by me the researcher, and not by my admiration for the expert.

The table below gives the reader a top-level overview of the key features of each study, making it easy to navigate and understand (Sweller, et al., 2011; Glanzer & Cunitz, 1966). This is followed by a subsequent analysis of the chosen data collection strategies to give the reader insights into the thought processes behind the decisions made:

Table 1 - An overview of the key aspects of each primary research study

Key features	Study 1	Study 2	Study 3
Aims	The aim of research study one was to investigate the perceptions of remote and online teaching as Covid-19 forced the first national lockdown.	The aim of research study two was to explore what constitutes effective teaching, learning and assessment when delivering online.	Finalise a developmental framework to underpin a digital transformation to enhance curriculum design and delivery.
Objectives	1) Analyse the views of delivery staff following the move to emergency remote teaching. 2) Evaluate the key priorities to be addressed to enhance one large FE college’s approach to remote and future online delivery. 3) Synthesise clear strategic direction to remote and online delivery and learning for the new academic year.	1) Identify commonalities in approach and delivery of effective online delivery and learning. 2) Consider and explore the priorities for developing online practices at individual and institutional levels. 3) Contextualise online learning approaches to the needs of FE colleges to ensure that the research impacts on professional practice.	1) Refine and consider what should be included at an institution when implementing effective EdTech to support online delivery and learning. 2) Finalise a programme of development for staff to develop their digital skills and confidence in order for an institution to deliver high quality online provision.
Data collection method(s)	Survey	Focus groups	Expert interview

Data analysis	Descriptive statistics & graphical representation	Thematic analysis	Thematic analysis
Limitations & Trustworthiness	A large sample size was used to mitigate against sampling error and the use of inferential statistics.	Due to the need for specialists, purposive sample was used meaning the findings are not generalisable to the wider population, although it is hoped the themes will give a good starting point for other institutions.	To ensure trustworthiness, processes of member checking and member reflection were implemented to enhance internal validity and the accuracy of the interview statements and subsequent analysis.

The rationale for the three distinct data collection strategies was deliberate in order to meet the aims of the research, and deliver the tangible outcomes desired. Employing a survey in primary study one (chapter 4) was the most appropriate method for gaining the views of a large population (Bryman, 2016). Implementing a survey enabled an exploration into the use of technology (remote learning) as the pandemic commenced. This method enabled me to act quickly, gather large amounts of data, and create themes and patterns from the data collected through descriptive statistics and graphical representation (Bryman, 2016; Cohen, et al., 2017). The strengths outweighed in my mind the limitations of using survey data in this instance, because gaining a great depth of information was not the primary requirement of the survey, and depth would be obtained in the subsequent studies. In addition, the large sample size gave confidence in the findings, mitigating the chance of responder bias impacting on the data obtained across a sample of over 250 people.

The use of a survey gathered large amounts of data, and reflecting on this delivered a breadth of detail that required subsequent data collection methods to obtain a greater depth of knowledge. To gain this richer understanding, and build on from the breadth obtained through survey data, I employed focus groups to delve deeper into specific themes and areas of interest in primary study two (chapter 5). I was cognisant to employ this method to gain superior insights from

the participants, as focus groups through discussion enable greater insights into the real world lived experiences (Krueger & Casey, 2015; Mears, 2017). I again considered the limitations of using focus groups in this research setting, but the limitation of group dynamics and peer pressure was not overly concerning for this particular research as the participants did know each other and have good relationships. That said, I was deliberate in the choice of participants in each focus group to mitigate against this. In addition, the lack of generalisability was not a concern, as the outputs of the research needed to impact in the research setting it was carried out in, which this method would permit.

Progressing to primary study three (chapter 6), and through my own interpretation of employing a funnelling system, where the methods employed progress from collecting data with great breadth to data with great depth, an expert interview was employed. The expert interview enabled expert knowledge to be accessed, enhancing the credibility of the research (Bogner & Menz, 2009; Meuser & Nagel, 2009) and gaining a greater depth of understanding that could inform future tangible outputs. As with the previous study, I was not concerned by a lack of generalisability obtained through the method, as this thesis was designed to first and foremost enhance the institution it was carried out in. This method was required to delve into greater depth concerning knowledge and practice in the research setting, which it would do. In addition, I implemented member checking and member reflection to ensure the data was based on my interpretations and not influenced by my admiration for the researcher, which was key in my thought process.

As I reflect on the implementation of the above, the collection methods were well thought out with clear purpose, and aligned to the stages of action research discussed earlier (page 71). The survey method linked to gaining data that permitted the planning and acting steps, focus groups aligned to the observing step, and the expert interview enabled the deep reflection and next steps stage of the action research process. In addition, and bringing the philosophy, methodology and collection and analysis methods together, the fluid approach of pragmatism supports the most

appropriate methods to be implemented to answer the specific research questions and proposed outcomes of the research. This was explicitly considered in my thought process throughout.

Ethical Considerations

One of the key considerations throughout all three of the primary research studies was the recruitment of participants. This process was something I reflected on throughout, especially as the research environment for the Prof D was also my place of work. I ensured throughout all three of the research studies that I was transparent in the recruitment process (Robson & McCartan, 2016), and that all potential participants were fully aware of all aspects involved in taking part in the research and that participation was voluntary (Mertens & Ginsberg, 2009).

To support with this, I created detailed information sheets for each of the studies (see appendix 6). The information sheets contained important information, including sections on the purpose of the study, what was involved in participation, confidentiality and withdrawing from a study. Producing this information for potential participants was vital, and I had developed this practice firstly when studying for my M Ed, continuing to develop my research processes throughout this Prof D. The use of these information sheets is consistent with the expectations set out by the University of Central Lancashire and the British Educational Research Association (BERA, 2018). It also helped me gain informed consent from all the participants in the study, which is vital for ethical research (Sieber & Tolich, 2013). I produced consent forms (see appendix 7) which accompanied the information sheets for each study as it was important for me to gain consent from all participants in the right way, respecting their judgments (Israel & Hay, 2006).

Another key consideration from an ethical perspective relates to power imbalances, and this was something I was explicitly aware of due to the research being conducted in my place of work. The participants in study one and study two were colleagues. The aforementioned information sheets and consent forms did help to mitigate against some issues, and it was not as great a problem in study one due to the method of data collection being a survey. However, in the recruitment for

this survey I ensured that participants had access to the detailed information sheet so they had clarity on the research. The power imbalances in study two required more thought because the data collection method was a focus group and I had a closer working relationship with the participants. To mitigate against this, I made it explicit to the participants that although I have a working relationship with them, participation in the research was voluntary and that our relationship should not impact on their decision. As with study one, a detailed information sheet and consent form also supported selection from an ethical perspective, and I explicitly explained the withdrawal process. It was also fundamental to explain the need for participants to give their honest views and opinions, and that anything discussed would be anonymised and was for the purposes of the research in this thesis, and would not be used in conversations in relation to their role at the college. This was a key distinction to make to all the participants.

In terms of study three, the power imbalances were different and presented a different challenge, in which the main power imbalances were the impact of the expert selected for the interview on me. The expert, Professor Paul A. Kirschner is someone I have long admired, so I was keen to ensure that this didn't impact on the research. I implemented the same processes as with the first two primary research studies in terms of information sheets and consent, and then from the outset explained the process, from the recording of the interview all the way through to full analysis and member checking and reflection. As I reflect on these actions, I believe they were pertinent to the success of this study, and allowed me as a researcher to focus on collecting strong data before making meaning from this data. It was another big development in my research journey, widening my experience of doctoral level research, and completing me as a researcher. These strategies were key in addressing power imbalances (Guillemin & Gillam, 2004).

Embedding Reflexivity

‘Reflexivity is a set of continuous, collaborative, and multifaceted practices through which researchers self-consciously critique, appraise, and evaluate how their subjectivity and context influence the research processes.’ (Olmos-Vega, et al., 2022, p. 2)

Throughout the research process, reflexivity as defined above has been intertwined at all stages, thus discussed here in the main thesis methodology and the subsequent three primary research studies. The use and embedding of reflexivity is for two main reasons; firstly, to improve the research itself. Although qualitative research is a well-respected and a popular approach to research, especially in education, it is accepted that subjectivity plays a part (Rees, 2020), and it is vital for the qualitative researcher to make the correct ethical and methodological decisions when collecting real-world data in order to negotiate the muddy research swamp (Finlay, 2002). By employing a process of reflexivity throughout the research, it is hoped that my own perspectives (bias) will not impact negatively on the new knowledge developed throughout the process (Olmos-Vega, et al., 2022). The second reason for the use of reflexivity is to acknowledge that I am not the finished article (and never will be) as a researcher, and by engaging in a process that encourages constant critiques, appraisals and evaluations, on completion of my Prof D I will be a more complete and well-rounded researcher.

The approaches of reflexivity utilised throughout this programme of research include personal reflexivity, interpersonal reflexivity, methodological reflexivity and contextual reflexivity (Olmos-Vega, et al., 2022; Walsh, 2003). The table below summarises these approaches:

Table 2 - Reflexivity Overview

Approach	Underpinning Principles
Personal Reflexivity	Ask yourself: how are our unique perspectives influencing the research?
Interpersonal Reflexivity: Power	Ask yourself: what relationships exist and how are they influencing the research and the people involved? What power dynamics are at play?
Methodological Reflexivity	Ask yourself: how are we making methodological decisions and what are their implications?
Contextual Reflexivity	Ask yourself: how are aspects of context influencing the research and people involved?

Adapted from Olmos-Vega, et al., (2022)

To harness the above reflexive approaches two methods were primarily used throughout this doctorate – reflective writing and collaborative reflection (Olmos-Vega, et al., 2022). This entailed recording key reflections throughout the process of each of the primary research studies, and developing these into a narrative autobiography (Ellis, 2004). This also enabled collaborative reflection through the use of my research team at the University of Central Lancashire, where key questions could be raised as part of a team-reflexive discussion.

The above methods were utilised throughout each of the primary research studies and reported in a section titled ‘Research Reflections’ at the end of each primary research study (chapters 4, 5 and 6). Finally, within the thesis conclusion a section titled ‘Personal Reflections – My Development as a Researcher in the Field of Education’ is underpinned by my own learnings throughout all aspects of this doctoral study, including that from reflexive approaches used in the research process.

Chapter 4: Research Study One – Responding to Covid- 19: Initial Exploration into Remote Learning

Chapter 4: Research Study One – Responding to Covid-19: Initial Exploration into Remote Learning

Chapter Introduction – Professional Context

At the commencement of this doctorate, a focus on how education technology (EdTech) could support and enhance approaches to online learning and how these could be better utilised in FE was a key priority. Appropriately, and aligned to the needs of the institution where the research was situated, this would prove valuable for enhancing provision and the student learning experience. In addition, the research would be essential in relation to my role within the institution and development as a pragmatic researcher within the sector. The premise for this research study would remain the same, however, during the planning of the study the Covid-19 pandemic hit the world. This meant that this research study would continue with the underlying priorities to focus on how online and digital learning could be better utilised with the addition of focusing on the impact and subsequent requirements to support what was initially defined as ‘remote teaching’ following Covid-19. The use of EdTech and online practices to enhance learning and support delivery in the FE sector has been a topic of debate for many years, best emphasised through the FELTAG report in 2014. However, it could be argued that limited progress has been made in the FE sector following this report. This chapter and subsequent research study would become even more important due to the current climate and unknown impact of covid-19.

The research was carried out in one large FE college – The Sheffield College. In my professional role and context, the research will prove to be vital in exploring the use of online and digital practices essential for success in how best to deliver learning through online modalities. Within my role, I am responsible for all aspects of teaching, learning and assessment (TLA), and this includes online and digital learning. This research study is significant from the perspective of defining a road map for my current institution, with the requirement to utilise online learning at the time of writing greater than ever before due to the pandemic.

The research utilised and was underpinned by pragmatism and action research as a paradigm for conducting the research. By adopting these approaches it ensured that tangible impacts on practice and the way things are carried out in the real world setting were influenced, which was key for the founder of pragmatism Charles Sanders Peirce, who believed there is no difference without a difference to practise. In this way, the research was significant and gave an excellent foundation to build on in the subsequent studies by highlighting the current state, offering insights into potential future states in the use of education technology to enhance online curricula design and implementation in a large FE college.

With the ontology of pragmatism framed through action, and the value of action superseding theoretical appreciation, the employment of action research will support the outputs of this research. In this way it is acknowledged that implementation, review and further implementation following refinement will be required as part of the action research process in order to have a positive impact in the professional context. This model represents an approach to educational research that is ongoing, reflective and places practitioners at the heart of the research. Moreover, it ensures that the outcomes of the research are recognised through the impacts on professional practice. Consequently, this means that this research study will not only form part of this thesis but the practical outcomes will inform practice in my professional context, with the potential to impact on several hundred staff in a large educational institution. It is accepted however, that the research outcomes from this study may not be generalizable to other institutions, but there may be significant principles that could be utilised by other institutions. In this way the appreciation of both knowledge influencing practice, and practice subsequently advancing knowledge, links concurrently to both pragmatism and action research.

Abstract

This research was a response to the changed landscape of education and society following the Covid-19 pandemic. The main aims of the research were to gain an understanding of the initial views

of staff in a large further education (FE) college to support future strategic directions and engender a digital evolution. Stratified random sampling was used to gather the views of 254 staff through a survey, with quantitative data available for each survey question, and supplementary graphical representations enabling ease of analysis. Results indicate that the majority of staff are confident in developing their digital delivery in the future (80% of respondents), and only a very small minority (6 respondents – 2.4%) view remote and online delivery as ineffective. Finally, results indicated that staff viewed the most difficult aspects of moving to online delivery to be not all students having access to a device or WiFi, student engagement, the digital skills and experience of the students, and getting students logged into the virtual learning environment (VLE). These results give an excellent foundation to build from, responding to the issues investigated in order to pragmatically synthesise clear strategies and approaches to remote and online delivery.

Introduction

Education, society, and the world as we know it is different. That is the impact of coronavirus (Covid-19). Education has had to adapt quickly in order to continue to deliver learning in some way. In March 2020, the nation went into official lockdown with people only permitted to leave their homes for limited purposes (Johnson, 2020). This led to education institutions having to radically change their delivery immediately, with an unknown timeframe of when life would return to pre-Covid-19. The need to deliver learning remotely through the use of EdTech would be a new challenge, one that the entire sector would need to embrace.

Online learning is not new, and much research has been carried out into effective online teaching, learning and assessment in a variety of settings (Means, et al., 2014), with a growing theory base for technology-mediated learning (Bower, 2019). A better terminology for how the education sector (and institution used for this research) is reacting to delivering education as the national lockdown became a reality is emergency remote teaching. This move to emergency remote teaching is vastly different from planned and considered online learning, and the judgements of the

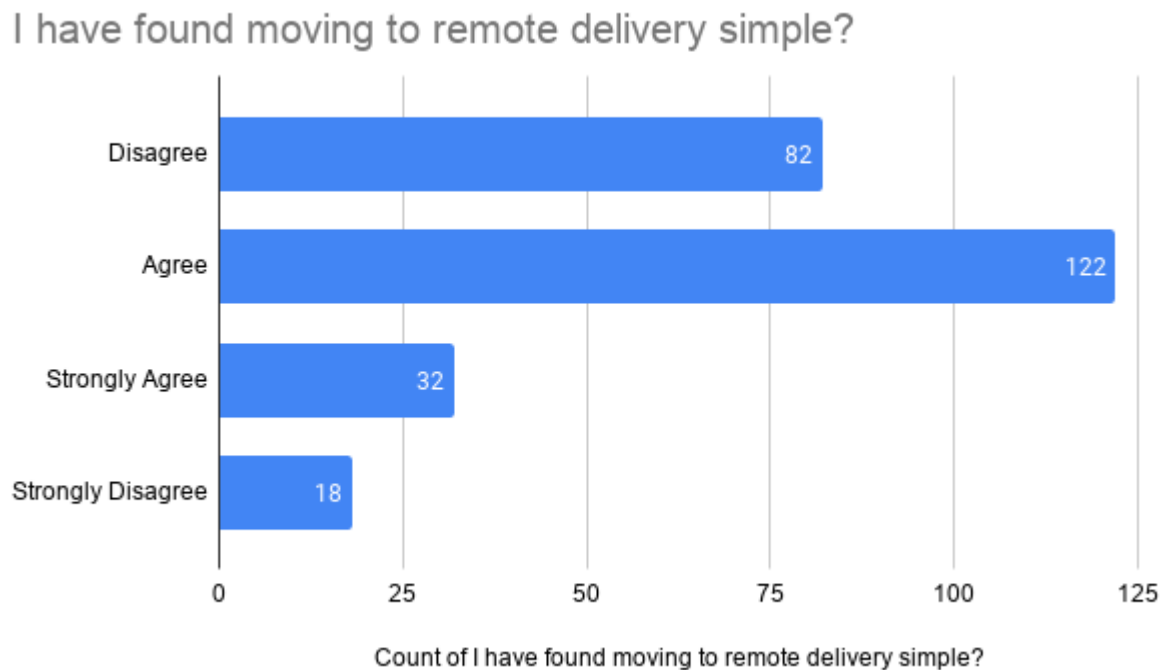
effectiveness of emergency remote teaching should be considered separate from fully developed online learning programmes (Hodges, et al., 2020). Furthermore, prominent research into the types of interaction during online research (Bernard, et al., 2009) pertinent to planning effective online learning programmes would not even enter the debate, as the initial reaction was one of remote emergency. Hodges, et al. (2020) define emergency remote teaching as a ‘temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated’ (Hodges, et al., 2020). This research is significant for understanding how staff have coped with moving to emergency remote teaching, which is the requirement due to Covid-19.

Therefore, this research aims to:

- 1) Analyse the views of delivery staff following the move to emergency remote teaching.
- 2) Evaluate the key priorities to be addressed to enhance one large FE college’s approach to remote and future online delivery.
- 3) Synthesise clear strategic direction to remote and online delivery and learning for the new academic year.

Results and Discussion

Figure 3 - a bar chart showing the responses to the question of moving to remote delivery.

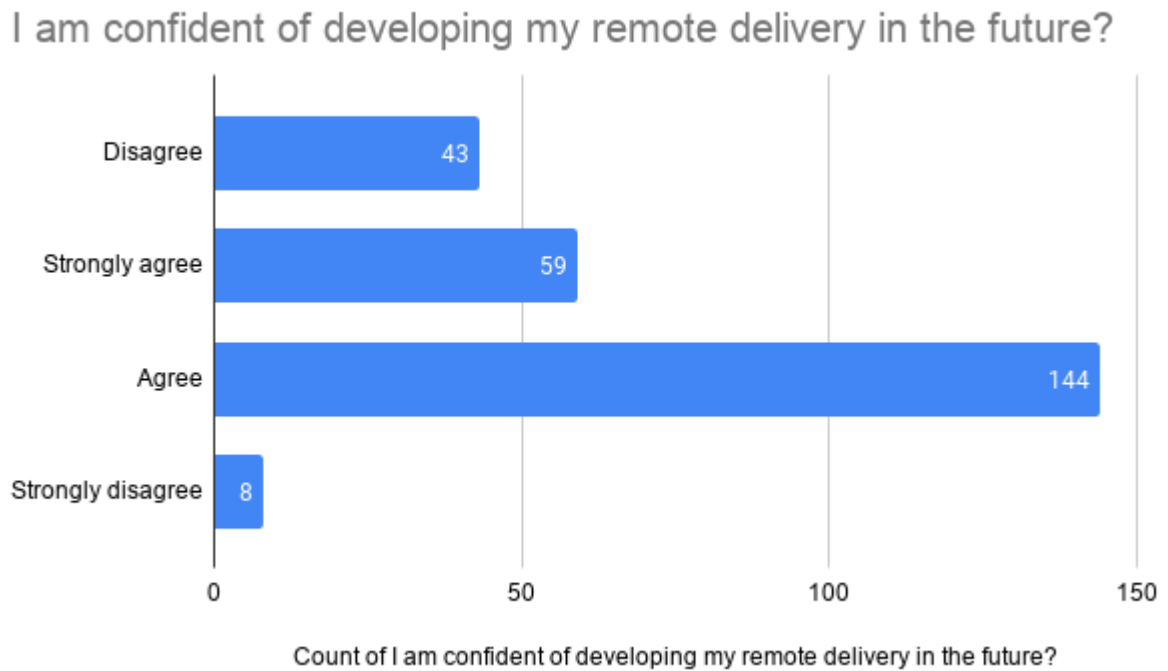


Not surprisingly, the results to this question intimate a degree of difficulty in moving to remote delivery. Of the 254 responses 154 are considered positive (strongly agree or agree) with 100 negative (disagree or strongly disagree). Although the positive responses equate to 61% of responses, it does mean that 39% of responses have not found moving to remote delivery simple. This corresponds with the findings from a study carried out by the Organisation for Economic Co-operation and Development (OECD) in 2018 that found less than 40% of educators felt ready to use digital technologies within their teaching (European Commission, 2020). These results could be due to the skillset of the individual, with previous research indicating that teachers who consider themselves more competent will utilise technology more within their practice (Petko, 2012). Teachers in the current study who did not find it easy to transition, likely have very low levels of technology skills and experience and have never used them previously, meaning the adaptation was greater for these individuals. This is supported by the recent European Commission public consultation, that found that almost 60% of respondents had not used distance and online learning

before the pandemic (European Commission, 2020). Furthermore, teachers who do not believe technology will enhance student learning and outcomes will not utilise it as much as those that do (Petko, 2012), again meaning a lack of previous use has meant the required knowledge and skillset to move to remote learning is lacking. There is also the possibility of the stage a teacher is in their career influencing how they use and perceive technology, with newer and younger teachers to the profession more likely to develop their use of technology for learning (Mirle, et al., 2019).

These findings are significant for this research and have key ramifications for the current situation (emergency remote teaching) and for the longer-term development of effective online delivery. For the current college, and although generalisations must be tempered, the skills and confidence that all teachers have to deliver learning online in the future must be a priority, with research already demonstrating the integration of developmental frameworks (Fallon, 2020), and specific to FE in England the teacher professional standards now have technology embedded into them. In addition, a new digital teaching professional framework has been established by the Education and Training Foundation (ETF) (Education and Training Foundation, 2019). Subsequently, a key consideration for this research to develop the practice in the sector is to devise a method for enhancing the digital skills of all delivery staff across the college.

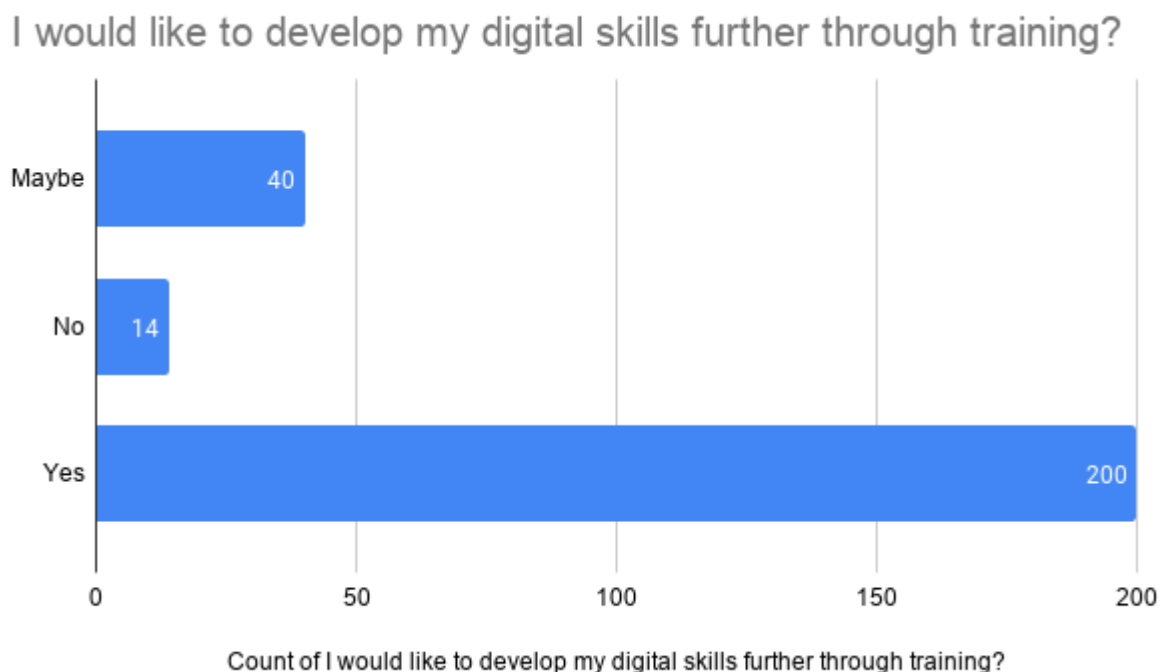
Figure 4 - a bar chart showing the responses to the question of confidence in developing remote delivery.



Responses to this question show an increased positive response rating with 203 positive (strongly agree or agree) opposed to 51 negative (disagree or strongly disagree). This equates to a positive response rate of 80%. This is interesting and further links to the need to ensure that there is a clear method for supporting and enhancing the digital skills of staff in the future. As above, external help is now available for all colleges through the ETF, but clearly each institution must enact a programme of digital skill enhancement and development for their staff. Research into the move to remote emergency teaching is clearly in its infancy, but Ofsted did carry out some research throughout June 2020 across 20 volunteer colleges and other providers. When collating evidence about the management of online education they state that 'The varying competence and confidence of staff with information technology has affected providers' success in making the transition to online learning. Staff training has been crucial.' (Ofsted, 2020). Clearly, this is a vital point for colleges now and in the future, and not just as a response to Covid-19. Staff must be equipped with the skillset to flourish and utilise education and digital technology in the most effective way to support learning. A report from 2015 stated that there is a requirement to enhance the digital skills

of all students through education, by ensuring no child leaves school without basic digital literacy and universities ensure that their graduates are digitally competent as examples (Select Committee on Digital Skills, 2015). It is also acknowledged in the report that ‘Many teachers are not confident or equipped to deliver the new curriculum’ (Select Committee on Digital Skills, 2015, p. 10) yet several years later this has not changed. One positive aspect for the development and utilisation of education and online technology following Covid-19 could be the commitment to developing its future use. This view is supported by the European Commission’s findings that state that 95% of respondents consider that the Covid-19 crisis marks a point of no return for how technology is used in education and training (European Commission, 2020). This has to be the foundation for ensuring that all teachers and educators are equipped with the skills and knowledge required to deliver quality online provision now and in the future.

Figure 5 - a bar chart showing the responses to the question related to staff developing their digital skills.

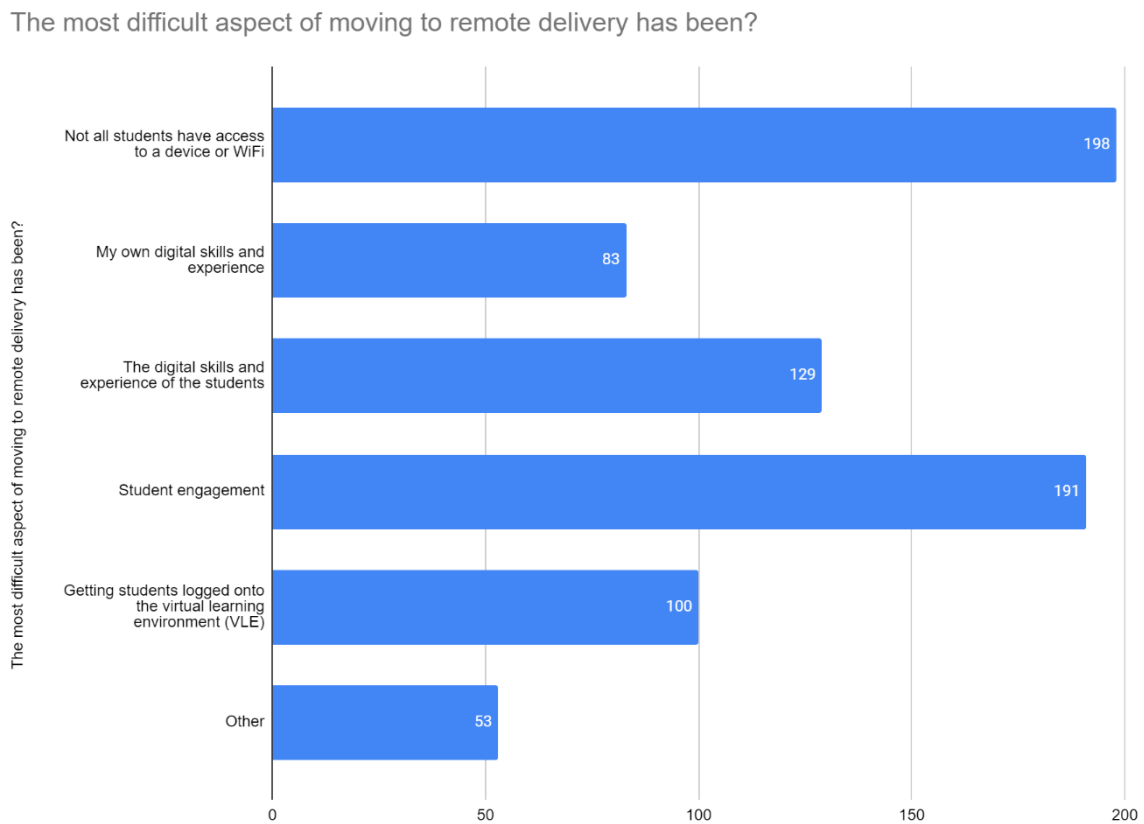


As a follow up to the previous question, staff were then asked a direct question about developing their digital skills through training. Again, 200 respondents, 79% were clear they would,

with 40, 16% stating maybe. Finally, 14 staff answered no. This is again of interest and unearths two key priorities; firstly, what are the reasons for those staff not wanting to develop their skills; and secondly, the importance of establishing clear strategic directions cross-college ensuring that all staff are actively engaged in the process of digital development.

The college used for this research, and the education sector as a whole must place a high emphasis on the digital skill development of their workforce, in the same way that having other specific qualifications are a requirement. This is not to force all educators to be digital leaders and innovators, but to be actively engaged in the benefits that education and digital technologies can offer. This could be as creative as giving greater opportunity for students to engage in learning, as pioneered by Daphne Koller who has utilised online learning through Coursera (Koller, 2015). It may be utilising virtual reality technology to synthesise a practical demonstration, or simply creating quizzes online that are underpinned by the findings from effective learning strategies (Dunlosky, et al., 2013). The crucial point is that the approach and mind-set toward digital technologies has to become endemic across institutions and the sector. In recent years in the FE sector alone, the ETF and the Society for Education and Training (SET) have raised the profile of professional educators and trainers through the professional standards and this must continue to underpin the commitment of staff to be reflective on their use and development of digital technologies. Research has shown how reflective practice can be used specifically to enhance online delivery (LaPrade, et al., 2014) and this must underpin the development of digital skills over the coming years. Finally, and to ensure that the approach to digital development does become endemic, leaders must prioritise and make clear their vision for enhancing digital capacity. Furthermore, by ensuring they themselves are upskilled and equipped to manage digital change, the transition could be more prosperous across an entire organisation (The Open University, 2020).

Figure 6 - a bar chart showing the responses to the question related to the transition to remote delivery.



The responses to this question offer further valuable insights for the purpose of this research and beyond. Access to a device and Wi-Fi is clearly shown to be an issue from this research, with digital poverty one of the greatest obstacles since the onset of Covid-19. This is perfectly summed up by Hannah Holmes and Gemma Burgess:

‘The likelihood of having access to the internet from home increases along with income, such that only [51%](#) of households earning between £6000-10,000 had home internet access compared with 99% of households with an income of over £40,001. The link between poverty and digital exclusion is clear: if you are poor, you have less chance of being online’.

(Holmes & Burgess, 2020)

Concerns are prevalent across the entire education sector, including HE, where data from the OFS shows 71% of respondents to their survey reported a lack of a quiet study space, with 22% severely impacted (Office for Students, 2020).

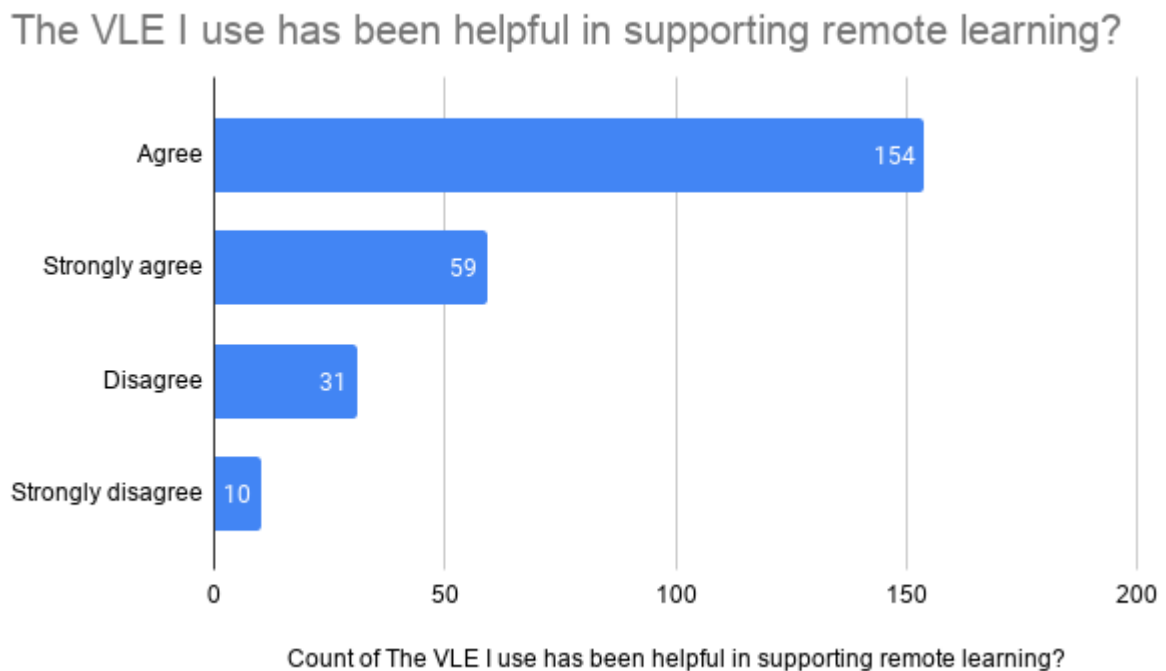
This is clearly a huge issue, and one that must be tackled if the full benefits of online learning are to be realised in the future. The government has initiated a programme of support to get devices to those that need them, as well as offering support with internet access (Department for Education, 2020), although this could be viewed as reactionary in nature. If digital and online learning is going to offer the great opportunities for all, and be the leveller for all education progression as discussed by Koller (2015), then a starting point must be to ensure that all students do have access to learn online, which is clearly not the case at the present time. As although the calls for a 300 million premium for disadvantaged pupils in Sheffield (The Star, 2020), and many regions have offered additional ways of getting educational content across their cities, for example Learn Sheffield creating weekly home learning supplements, governmental support and direction must lead the way in ensuring that everyone can access high quality learning online.

Two further key results from the responses to this question are the 83 responses to 'my own digital skills and experience' and 'student engagement', with 191 responses. These findings link closely with the previous discussion regarding the need to equip staff with skills to deliver effectively online, and as previous, it is important not to judge the effectiveness of this emergency move to remote learning with planned online learning that has been crafted and put together by skilled practitioners (Hodges, et al., 2020). Two points to raise here are that online delivery should be planned rigorously for the programmes and students undertaking the programme, to ensure that it meets the needs of the students on the respective programme. Fully online provision, as was the case during the lockdown process in March 2020, may not be the preferred way for most programmes. Secondly, the skillset of the teachers in creating the content and delivering it both synchronously and asynchronously must be high. Those that are more confident and have a greater

range of digital skills will engage students better, utilise education technology more and may not have the issues with engagement that less confident staff do. These are key points to take further from this research when formulating the next steps for digital delivery for this one college, but also across the sector as a whole.

The final response of note from this question was related to getting students logged onto the college's VLE, again an issue for 100 staff in this questionnaire. This again links to the accessibility issue, although this could be more of an internal issue with the college's technical systems for enabling a simple and effective way for students to log into their VLE. Moreover, it may also be linked to the competency of the staff in ensuring that students are inducted well onto the online systems. It is likely that a large majority of those who stated this as a response were only getting students to use the VLE at the onset of moving to emergency remote teaching, when in reality, this should form part of all programmes of study. This is a further key development point for the future of this college, and those across the sector if the aim is to utilise digital and online learning beyond that of an emergency.

Figure 7 - a bar chart showing the responses to the question related to the college virtual learning environment (VLE).



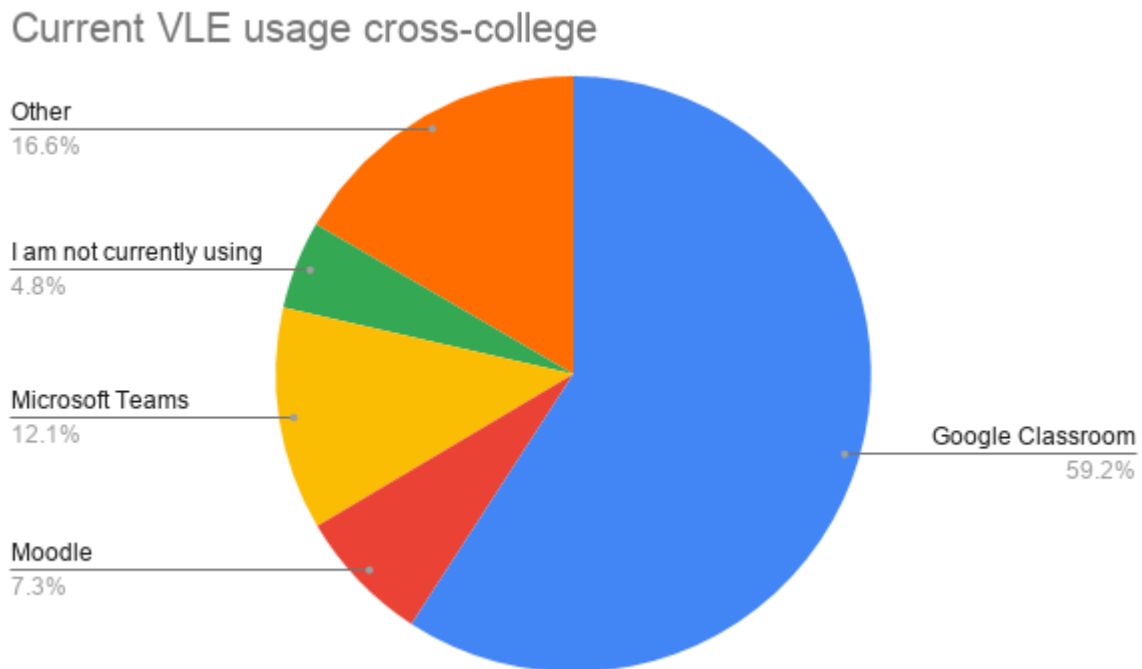
For any institution to maximise their approach to online delivery an effective VLE is required. Most institutions now have VLEs but the effectiveness and implementation of such environments is questionable. Results here indicate 213 staff (84%) were positive (strongly agree or agree) about the VLE, with 41 staff negative (16%).

VLEs should support learning and give students the opportunity to learn without being physically present in an institution (Gurtner, 2015). Interestingly, and as shown in figure 6 below, the college used in this research does not have one clear approach to a VLE according to the responses in the survey. Google Classroom is comfortably the most prevalent but several other systems are being used. This would suggest that no clear direction for online delivery and VLEs is in place at the college, which is certainly something that should be addressed in the future. Evidently, all technologies and VLEs can be useful if used and implemented correctly (Evans & Wilkins, 2011) but logically it must be easier to get one system implemented correctly, as opposed to several. With successful implementation of a VLE requiring a great degree of infrastructure from an IT department (Green, et al., 2006), staff development related to digital learning (Kelly & Ferrell, 2005), training for

students, data analytic systems embedded to name a few aspects, having one VLE clearly enables these processes to be implemented far easier than across several. This may be part of the reason for the 41 staff who responded negatively about the VLE, and as previous, it is likely some staff had never placed any focus on supporting learning through a VLE, with the move to emergency remote teaching the first try at this.

Responses to this question again give a great starting point for further investigation in the development of an effective VLE. Firstly, at the college in question, there is need to better define the direction of the VLE, with the first priority implementing one VLE that can be made excellent, and a tool to support all future learning, no matter how much content is delivered online. Secondly, a systematic approach to training and educating staff about the functionalities and possibilities offered by a VLE is required. It is crucial that teachers don't just 'do something' to evade scrutiny, but engage in meaningful training and development and consider how a VLE can support them pedagogically, understanding that a VLE is not a simple resource dumping ground but developed and modernised VLEs are student focused, enabling collaboration between students (Gurtner, 2015).

Figure 8 - a pie chart showing the responses to the question of which virtual learning environment is used.



Conclusion

This research focused on the perceptions of staff at one large FE college following the move to emergency remote teaching, as defined by Hodges, et al. (2020). Although numerical data was gathered from 254 staff across the college it was framed to understand perceptions, with descriptive data utilised in order to achieve this. This research forms part of a continuing body of research with elements subsequently developed from aspects here.

One of the key findings of this research is the requirement to enhance the digital skills and confidence of all delivery staff within an institution, in this case a large FE college. Within the FE sector support is available, for example through the ETF, but the implementation of any development must be established and led by an institution, and this is central to ensuring online delivery approaches are maximised for all delivery modes and programmes. This college must

develop a process that supports all staff to improve their use of educational and digital technologies as a priority.

Closely linked to the above is the requirement for strong leadership throughout the organisation that places digital skill development on the same pedestal as other qualifications for delivery staff. In this way, engagement with education and digital technologies moves beyond compliance and becomes part of professional development to enhance learning. Moreover, developing digital capacities becomes closely linked to pedagogical discourse and is not reactionary, thus moving from emergency remote teaching to principles of effective online delivery.

Finally, and to support with enhancements to online learning the college used in the research should develop and define a clear vision for the use of a VLE. This will then enable all aspects to be improved that underpin an excellent VLE, some of this relating to the technical systems behind the scenes, and for training to be engendered as part of the greater digital skill development into the implementation of VLEs.

Conceptual Mapping

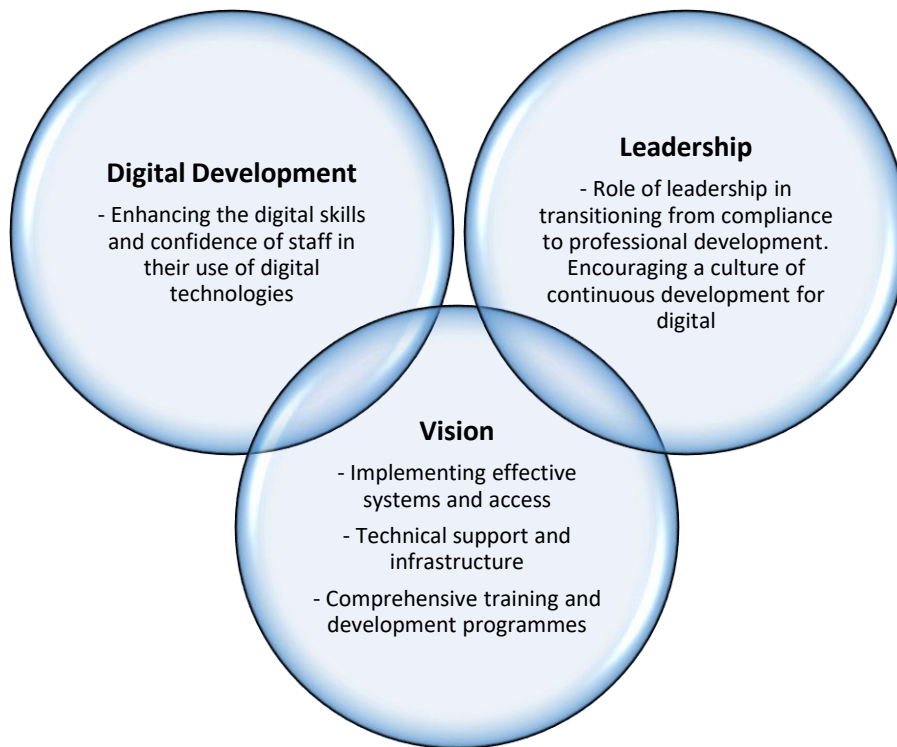
Following the completion of this research study, and to aid with the subsequent impact section in this study and future studies, I have completed a concept mapping exercise to help me reflect on what the research means at this instance. This mapping exercise encourages both reflection and reflexive actions, and aligns and connects my thinking throughout all the research studies. In addition, and as discussed in the methodology section, this first study aligns to the planning and action stages of the action research cycle (Lewin, 1946). Reflecting now, this deliberate decision was important for connecting the main method for data collection for this study – a survey – with the need to explore views and perceptions quickly across a large sample size.

Although the data was analysed in detail above, the conceptual mapping was something through reflection I was keen to embed for several reasons. Firstly, and vital for a programme of research this large, going through this process enabled me to clarify complex ideas and break down

large amounts of data and information into manageable chunks (Novak & Cañas, 2008). This also enabled me to focus on what processes, policies and products I needed to develop as a priority. Secondly, and as can be seen in figure 7 below, concept mapping facilitates the connections between concepts (Nesbit & Adesope, 2006). I have chosen to do this visually as it helps me to create simple relationships between the concepts. This was something I first implemented during my M Ed, and I have continued to use and develop my approaches through reflection and introspection. In relation to the next section in this chapter – Links to Professional Practice – I also find concept maps useful for organisational purposes, vital on the aforementioned next section, so that the output of the research is aligned to the concepts developed, and nothing is missed (Buzan, 2006). This also links back to my research philosophy and the need to impact and improve practice. Finally, and vital for research spanning the duration of this Prof D, the conceptual mapping from this study will assist in the subsequent research studies (Healey, et al., 2010), resulting in a programme of research that is aligned, with each phase of research building on the previous. This also links back to the cycles of action research, and how these will be implemented in the forthcoming research studies.

The three key concepts mapped following data analysis are shown below. These now underpin the next section, which was important for my approach and beliefs to what research should be used for. Starting with the concept of digital development, then leadership and vision, the next section discusses the initial steps in addressing the concepts, aligned to the planning and action phases of action research. Beyond this, the concepts will be used to direct the subsequent studies.

Figure 9 - Concept map study one



Links to Professional Practice – Impacts on Practice

Digital Development Programme – first iteration

This research study provided three clear findings for review and analysis in order to improve practice in the context of the research. The first of the key findings was to initiate a process for creating a digital programme to support staff in their use of digital and online tools. Previously at my current institution, and anecdotally at institutions across the education sector, staff training sessions to support the use of education technology have been stand-alone sessions, and in many cases opt in. Following this research, we (note, the term we is used at times during this section to underline the whole-college approach to the digital transformation) proposed to create an ongoing digital development programme that would take staff on a journey, ensuring that training is ongoing and has an outcome as opposed to a one off staff training session.

Following subsequent research into the best models used by leading authorities and companies, for example Google, Microsoft, Apple, and even the ETF, we started to build an internal

programme that would be based on all of the resources required to deliver effectively in our institution. We then ensured that the sessions were sequenced and tailored to meet the needs of the staff and their varying levels of technology confidence and competence. This key principle ensured that all staff felt part of the journey, and had a bespoke starting point to commence their training. In the first iteration of the digital development programme and due to the needs to accelerate its inception because of the Covid-19 pandemic, live training sessions that were delivered to staff were also recorded and then uploaded to the first website. This enabled those going through the training to work asynchronously and revisit materials in their own time. Moreover, a key principle that we wanted to run through the whole programme was that each training session and topic formed part of a programme of training, thus moving away from the previous sheep dip (Scales, 2011) approach to education technology CPD. In the first iteration of the programme this led to the creation of specific levels that staff would work through during the programme. These levels were named Digital Explorer, Digital Adopter, Digital Leader and Digital Innovator (Fig 7). The Digital Explorer and Adopter levels were based more on the skills and competencies required to use certain technologies; whereas the leader and innovator levels were focused more on the pedagogy of using technology. The Digital Explorer level, the first level for staff to complete, was focused on some of the basic tools staff would need to be able to use to deliver learning online and in the future in blended approaches. For example, Google Docs, Google Forms and Google Classroom. The Adopter level then built on this by introducing further tools that would support collaboration, quizzes for recall and the tracking of progress during online synchronous lessons. The leader and innovator levels were developed to be case study based as opposed to the previous levels where the learning of a tool or software programme was the aim. These advanced levels were also mapped across to the Google for Education training suite as that is the suite of tools we used to deliver learning at the institution.

Figure 10 - Introduction to the levels of the Digital Development Programme on the newly developed site

		
<p><u>DIGITAL EXPLORER</u></p>	<p><u>DIGITAL ADOPTER</u></p>	<p><u>DIGITAL LEADER</u></p>
<p>Is designed for staff who are new to Education Technology and Google for Education.</p> <p>On completion of this programme you will be able to develop a more blended approach to your delivery.</p> <p>You will receive certification for becoming a Digital Explorer and be able to progress onto our Digital Adopter programme.</p>	<p>Is designed for staff who have some experience in using Education Technology and Google for Education.</p> <p>On completion of this programme your blended approach will be more advanced, utilising Google for Education.</p> <p>You will receive certification for becoming a Digital Adopter and be able to progress onto our Digital Leader programme.</p>	<p>Is designed for staff who have extensive experience in using Education Technology and Google for Education.</p> <p>Completion of this programme will provide you with the skills to critically evaluate your use of Education Technology.</p> <p>You will receive certification for becoming a Digital Leader and be able to apply for innovation projects across college.</p>

The Programme and Content

The need for a modern way of developing the skills, confidence and understanding of all staff was apparent following study one. Moreover, a programme that focussed on a long-term approach to developing the digital skills and subsequent usage of those skills was a fundamental aim.

Due to the size of the college and the numbers of staff who would be involved in the journey, and following the results from study one that identified that a large majority of staff were using the Google suite of educational tools, this would underpin the programme of development. This decision did create some reflexive and personal critical debate as I sought to take account of my own preference and positionality (Walsh, 2003), making my thoughts explicit to me the researcher but also the audience (Gentles, et al., 2014). I internalised differing approaches to the programme, one that utilised one ecosystem package as opposed to multi ecosystems. During this phase I found that making this explicit beneficial to reduce my own biases for one approach opposed to the other.

The decision needed to be for the right reasons, not because it would make my role in enacting the transformation easier, although the ease in which transformation could be implemented had to be debated, as ultimately this would impact on the success of the digital development programme and subsequent digital transformation.

During the initial process I contemplated the pros and cons of a transformation based on one ecosystem, to several. Within this I had to be cognisant of the position of the college (needing to achieve at least good in the next inspection by Ofsted) and education on the whole due to the ongoing pandemic. I found this process useful as a researcher trying to influence practice through research, and following my personal introspection I invited a close team for their thoughts. Once more, this was a useful way of making progress with the decision, especially as once I had decided the approach it would be very difficult to change direction.

As a doctoral thinker, embedding reflexivity at each stage of the process, and considering my thoughts and motives (Finlay, 2002), has been a success in terms of developing me as a researcher and the outputs of the research. I particularly benefitted from the self-reflection and critique, prior to meeting with a trusted team to ensure the due diligence had been placed on such a decision.

At this point, and mainly due to the uncertainty of the pandemic and the circumstances of the college, the decision was made to base the digital development programme on the Google for Education suite of tools.

Digital Explorer, Digital Adopter, Digital Leader and Digital Innovator

My own experiences of digital development over several years and several colleges highlighted to me how fragmented the approach had been. A plethora of research also cited this to some extent, hence how education technology had not had the sustained impact required (Department for Education, 2019; FELTAG, 2014; Laurillard, 2008). A premise for this programme had to be making digital development long-lasting and endemic in the organisation. It will also need to cater for the varying levels of skill and competency in the college.

With this in mind, the programme required levels, working on a continuum of skill development initially up to more advanced implementation and critique. These were captured in some early diagrams that helped formulate further ideas and build the programme up step-by-step. Figure 8 makes explicit the layered approach to the programme, and early versions also included the relationship between development from internal training and how these aligned to external support. Figure 9 developed this further and introduced a key premise of the programme, which would progress from the skill of using technology to the pedagogy of using technology.

Figure 11 - Early Digital Development Programme Outline

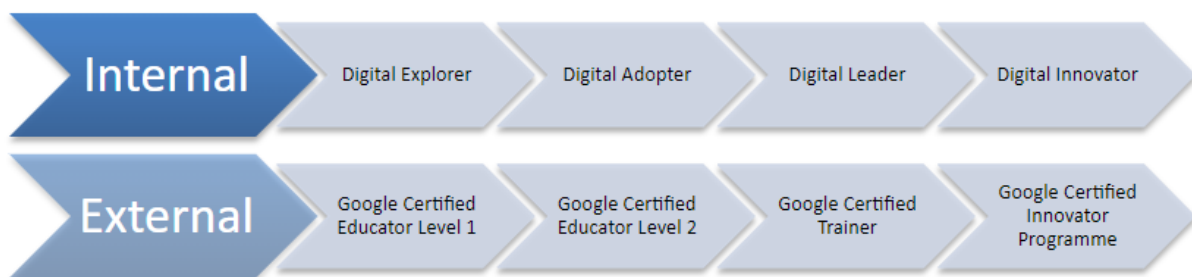
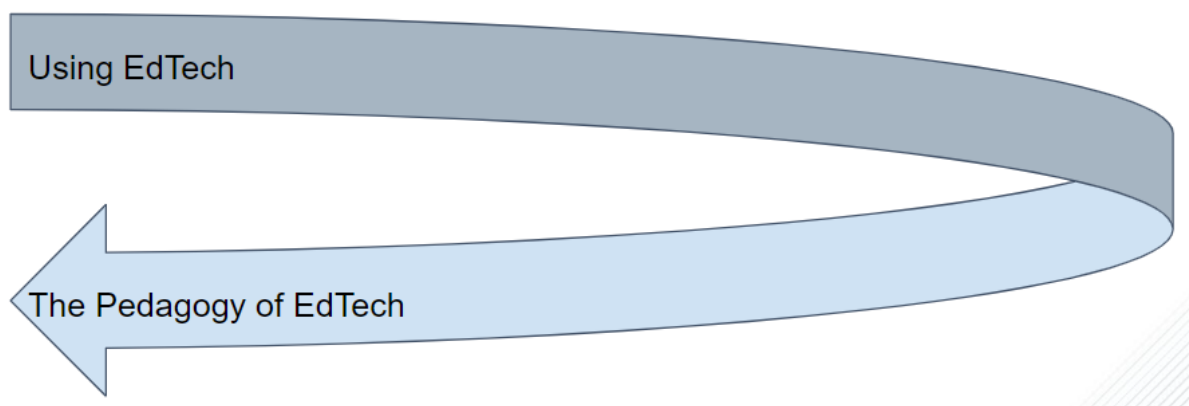


Figure 12 - Skill development to pedagogical fluency



At this point it became possible to start contemplating what would be needed in the differing levels of the programme regarding content. In terms of the theoretical support frameworks the Technological Pedagogical Content Knowledge – TPACK framework (Mishra & Koehler, 2006);

the Replacement, Amplification and Transformation framework, or RAT (Hughes, 2000; Hughes, et al., 2006); and the Substitution, Augmentation, Modification and Redefinition model, known as SAMR (Puentedura, 2006) were all useful at this point in designing the stages of the programme. Explicitly, the RAT and SAMR models were salient in devising the digital explorer level of the programme, with both these models using the term replacement (RAT) and substitution (SAMR) to describe the initial prescriptions for the use of technology. This corresponds well to the overarching aims of the digital explorer level, which was concerned with ensuring staff had the basic skills to implement digital tools to replace/substitute techniques implemented in classroom delivery. This was salient due to the pandemic.

Following the decision to base the programme on the Google suite of tools, and the embedding of a series of levels for staff to work through, the next stage of development was to contemplate the critical content for each level. To systematically reflect on the construction of knowledge and embed reflexivity throughout each step of the process (Malterud, 2001), I commenced by comparing the aims of the levels in relation to known theoretical models (RAT, SAMR & TPACK). As previously mentioned, the intent of the first two stages, the explorer and adopter stages, was more aligned to basic skill development, i.e., following the successful completion of the level staff would be able to use a form, or create interactive classes in Google classroom. I was also committed to not overwhelming staff in the early stages of the programme, something I had felt would have been the case if I had simply employed the Google educator programmes, or the Essential Digital Skills programme developed by the ETF. With these thoughts in mind, I asked the question, 'what are the minimum tools staff need to be able to deliver learning well through Google?' On answering this, it would also emphasise a clear expectation on staff at a cross-college level, something vital for a digital transformation (Department for Education, 2019; FELTAG, 2014).

This led to four main applications in Google's ecosystem underpinning the digital explorer level of the programme (see figure 10 below).

Figure 13 - Digital Explorer Level



The iterative nature of this development led to the digital adopter level being finalised at the same time. The adopter level aimed to add more tools for staff to be confident with, however, the premise of this level was the same as the explorer level, one based on skill. Going through this process was deliberate and important for me, as a pragmatic researcher underpinned by an action research methodology. For me, research has to end in practice change, and these detailed stages of development for each level were a key aspect of developing as a doctoral thinker and doer (Powell & Long, 2005). The adopter level had an additional five applications that staff would need to show proficiency in usage.

Figure 14 - Digital Adopter Level

DIGITAL ADOPTER



Linking back to figure 9, the initial planning of the programme was based on utilising differing levels to support staff to initially become proficient in using digital tools (skill development), prior to greater consideration of the pedagogy of embedding technology. This is where the final two levels of the programme would be important, the leader and innovator levels.

At this point, I also reflected on these ideas critically against the prominent models discussed earlier that are employed in educational contexts to guide the integration of technology into teaching and learning practices. Each of these models (RAT, SAMR & TPACK) offers distinct perspectives on how technology can be leveraged for educational enhancement. However, a critical examination of these models reveals both their strengths and limitations, and throughout this process of development, I was keen to revisit these.

The SAMR model (Puentedura, 2006) provides a hierarchical framework that classifies technology integration into four levels: substitution, augmentation, modification, and redefinition. Although SAMR offers a clear progression in the use of technology, it tends to oversimplify the intricacies of pedagogical practice. In truth, the model may inadvertently encourage a checklist

approach, where educators focus on aligning to the SAMR levels without necessarily considering the usefulness or suitability of the technology integration (Hamilton, et al., 2016). Furthermore, and critical for implementation in diverse educational settings, the SAMR model does not explicitly address the socio-cultural and contextual factors that influence technology integration. (IBid).

The RAT model (Hughes, 2000; Hughes, et al., 2006) also delineates levels of technology integration, emphasising replacement, amplification, and transformation. It offers a nuanced perspective by emphasising the potential for technology to not only substitute traditional delivery methods but to amplify and transform teaching and learning experiences through technology. However, the RAT model implies a unidirectional movement from replacement to transformation and in reality, technology integration often involves iterative processes with feedback loops, rather than a linear trajectory (Reeves, et al., 2005). Additionally, the RAT model is potentially limited in terms of applicability to specialised fields, as it does not explicitly address the integration of technology across diverse content domains.

On forensic examination, the SAMR and RAT models have commonalities throughout, with the limitations discussed above also somewhat similar. The TPACK framework is slightly different to the aforementioned models. The TPACK framework, presented by Mishra and Koehler (2006), posits that effective technology integration requires the intersection of Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). This model places the importance on the interplay between technology, pedagogy, and content, recognising the ever-changing and complex nature of teaching practices. However, one of the main limitations of TPACK is that it is conceptually difficult for teachers to operationalise in their practice, as a deep understanding of multiple knowledge domains is required for successful implementation (Niess, 2008). Moreover, the model could benefit from more explicit guidance on how to develop and assess the impact of TPACK implementation, and greater consideration could be developed for addressing the ever-evolving landscape of educational technology (IBid).

These models do provide valuable structures for conceptualising technology integration in educational institutions, but limitations are present across the models. Reflecting on this in relation to developing the levels of the digital development programme were valuable throughout each phase of development. This was the case when considering the more advanced levels, where the intent was to progress the focus of pedagogy as opposed to basic skills for usage. During this process, it was useful to link to the models, for example, the modification and redefinition aspects of the SAMR model, and the amplification and transformation aspects of the RAT model, were useful to contemplate in relation to the leader and innovator levels of the programme. The underlying concepts of these stages in the models deal with practice changing because technology can actually advance delivery, which is bold in nature. This aligns well with the intent to move to the pedagogy of EdTech (fig 9), where on completion of the leader level staff should be able to re-imagine their practices. In addition to this, I had to be cognisant of the TPACK framework and how that would be engendered in these advanced levels. One key outcome of this was the assessment of the leader level, which would need to be different from the explorer and adopter levels.

A final consideration at this time was how the programme, and each level would be assessed. This commenced with horizon scanning how this was incorporated and implemented by technology leaders such as Apple, Google and Microsoft, and then looking at sector specific approaches such as the Education and Training Foundation's (ETF) Digital Teaching Professional Framework¹⁴. Reviewing these approaches was deliberate and helped my initial thought processes take shape, with a theme of competence developing and shaping how I wanted to embed assessment in the early stages of the programme. In addition, I was keen to ensure that the approach to assessment was both flexible and accessible.

As mentioned above, the initial stages of the Digital Development Programme were based on the development of skills and competencies, with subsequent levels based more on how

¹⁴ Digital Teaching Professional Framework available [here](#).

pedagogical approaches could be amplified through education technology. Assessments through multiple choice questions (MCQs) are a popular choice when assessing online, and are flexible and accessible, which was key in the design process. In ascertaining both the skills and competencies of someone, Popham (2018) argue that MCQs can effectively measure factual knowledge and are well-suited to large scale assessments. Moreover, and key in my thought process was the ability to automatically grade, assess and give feedback on the completion of a multiple-choice assessment. This was vital to develop the skills and competencies of staff at pace, with only a very small digital team working across close to 600 staff.

There are criticisms of MCQ assessments for consideration. Firstly, there are concerns regarding the ability of MCQs to assess higher order cognitive skills. Bloom's taxonomy, as discussed by Anderson & Krathwohl (2001), places a great emphasis on skills such as analysis, synthesis and evaluation, which are hard to capture through MCQs. Biggs and Tang (2007) question the use of MCQs, as they believe MCQs encourage more surface-level learning as opposed to deep comprehension, as they primarily assess memorisation. However, and although this criticism is accepted, it did not impact on my willingness to deploy the MCQ approach, as the digital explorer and adopter levels were both based on assessing the skills and competencies of staff in using technological tools and software.

Of more concern when designing the assessments for the initial stages of the programme were issues of test-wiseness and guessing strategies from participants. Roediger & Marsh (2005) stress the need for careful design to reduce these factors. Furthermore, the potential for item-writing flaws, as identified by Haladyna, et al (2002), requires rigorous item and question development to ensure the validity and reliability of MCQ assessments. This was salient in my thought process during the assessment stage, and I spent time initially postulating how MCQs could underpin the assessments for the explorer and adopter levels of the programme, without impacting on the validity and reliability of the assessment undertaken. This process was beneficial and the

continuous reflecting on my thoughts and motives (Finlay, 2002) developed my ability to construct and reconstruct meaning, and meaning into action in an applied setting (Kemmis & McTaggart, 1988; Kemmis, 2009). This led to me internalising how to make assessment flexible and accessible, without being constrained by time, but with the acknowledgement that the assessment was still required to mean something. On the last point, I did not want staff to be able to pay 'lip service' to the training and simply rush through it without cognitively engaging with it. This led me to include variety in the MCQs as part of the assessment, including a range of differing questions and questions appearing in a different order.

With the actions above instilled MCQs were established as the most appropriate form of assessment for the explorer and adopter levels. However, and although this approach offers practical advantages for online and asynchronous learning environments and pathways, I was cognisant that the more advanced levels of the programme required a different approach to assessment in order to meet the aims of these levels, which moved from skill-based aims to a deeper understanding to progress to the pedagogy of education technology. Complimenting MCQs with other assessment methods that enable a deeper understanding is advantageous, and corresponds with Race (2001), who stresses the importance of embedding a variety of assessment tools to capture a comprehensive view of student learning as key principles of blended assessment. This is also salient in the evolution of this programme and the wider aim of continuous development in digital capabilities, with the progress through the holistic programme of paramount importance. With the explorer and adopter levels based on MCQs the leader and innovator levels would be based on case studies and project-based learning, with staff challenged to develop, implement and review the use of education technology in their practices. This also links back to the transformational stage discussed in the RAT model (Hughes, 2000; Hughes, et al., 2006) and the redefinition stage in the SAMR model (Puentedura, 2006).

At this point, there was a clear pathway for development. Firstly, the Digital Development Programme now had clear aims, with content built on the Google for Education suite of tools. In addition, the levels of the programme along with the assessments for the levels were now defined and linked back to the aims of the programme. It is important to state at this point, that this permitted the first iteration of the programme to be built, but subsequent research conducted in the thesis is likely to develop the programme further, as the action research methodology is implemented alongside reflexive approaches.

Interface Design

With the content of the programme developed along with assessment approaches, it was now a requirement to consider the design of the user-interface prior to launch. Interface design is clearly important for the success of any online platform of learning, as if the training is not accessible to users then it is redundant. However, balancing the search for the perfect design with the need to launch the programme as soon as possible was something that I had to consider throughout this process. In addition, and as detailed above, through the iterative process of action research there would be scope to refine all aspects of the programme following testing and user feedback.

The user-interface has to guide the attention of users to improve comprehension, and some of the early pioneers discussed how this relates to the proximity, similarity, closure and continuity of information (Wertheimer, et al., 1923). There is also the need to have a thorough understanding of end-users' needs and preferences, with the design methodology of User-Centred Design advocated by Norman (1988) and Cooper (2004) emphasising this. Reflecting on this design methodology one of the key aspects is the iterative design cycles proposed, and this is fundamental to the success of any project, and aligns to action research.

Another key aspect from the literature, and in my own thought process at this stage was how the information would be presented in order to reduce cognitive load (Sweller, et al., 2011). Information architecture (IA), as defined by Morville and Rosenfeld (2006), is concerned with the organisation of content in a logical and intuitive way, enhancing the ease in which users can navigate

through the desired content. The requirement to extend all of the above to mobile devices was also prevalent in my thought processes. The importance for seamless experiences across devices (Wroblewski, 2011) has never been so prevalent.

At this point, my focus proceeded to selecting the most appropriate digital site. In this short reflective piece, I will elucidate my choice, which was Google Sites. This proved optimal and linked to the above literature and the specific requirements of the project – creating the Digital Development Programme.

Firstly, with the initial stages of the training programme based mostly in the Google for Education tools, including sites, using sites was a good way of highlighting how they could be used and sharing best practice. Google Sites is a web-based platform that offers an easy to use user experience, and as discussed, this was a key priority in my thinking. The imperative for a user-centred design (Cooper, 2004; Norman, 1988) is achieved through Google Sites, which are designed for ease of navigation. In addition, sites are highly customisable, which is an added benefit (Google Workspace, 2023). Google Sites also align with the ideas of IA (Morville & Rosenfeld, 2006), as they offer robust organisational capabilities permitting the logical arrangement of content. This presentation of information in digestible forms reduces cognitive load (Sweller, et al., 2011), which is paramount in any form of learning.

Furthermore, and as with all applications in all of the large operating systems, regular improvements have now made the integration of useability accessible on all devices (Wroblewski, 2011). The speed in which Google Sites have improved this functionality has ensured that there is no need to code or develop high specification background operating systems, and designs will be automatically adapted, through Google's responsive design principles, resulting in the developed digital site becoming accessible and functional across diverse devices. This was a huge positive in my thinking when researching the functionality of sites.

There is one final key imperative that was required in addition to the above, one of accessibility. Accessibility in the design process, ensures that interfaces are useable by individuals with disabilities (Henry, 2007). This is clearly an imperative, and in previous years when website design was more dependent on skilled and trained people, who would build and code a site from scratch, would have required additional time and resources. However, and a key influencer in the decision making process, Google build highly effective accessibility requirements into the design of Google Sites¹⁵. This includes automated help when designing a site to additional accessibility features such as screen readers. This is a strength of using sites, and considering this with the need to balance perfection with time and resource, this made the use of Google Sites an excellent choice.

To conclude, when taking the reader through my thought processes that culminated in the selection of Google Sites as the digital site to host the Digital Development Programme, design principles, useability through logical presentation of information were salient. Moreover, the alignment to user-centred design, underpinned by IA, with responsiveness to mobile devices and embedded accessibility validated the choice within the context of my research needs.

Leadership Support

The second key finding from the research links to the above and how we firstly designed and subsequently implemented the digital development programme. The executive leadership team at the college led by the Principal and Chief Executive Officer explicitly supported the college's digital transformation through the digital development programme (Fig 12). This support entailed giving extra training time during the CPD week in July 2020, taking part in the training, and introducing the training programme through a short video that was placed on the digital development programme training website. The institutional leadership clearly supporting the vision and direction for the college, subsequently impacted positively on the engagement with the programme.

¹⁵ The Google help sites can be accessed [here](#).

Figure 15 - College Principal introducing the Digital Development Programme and Summer CPD 2020

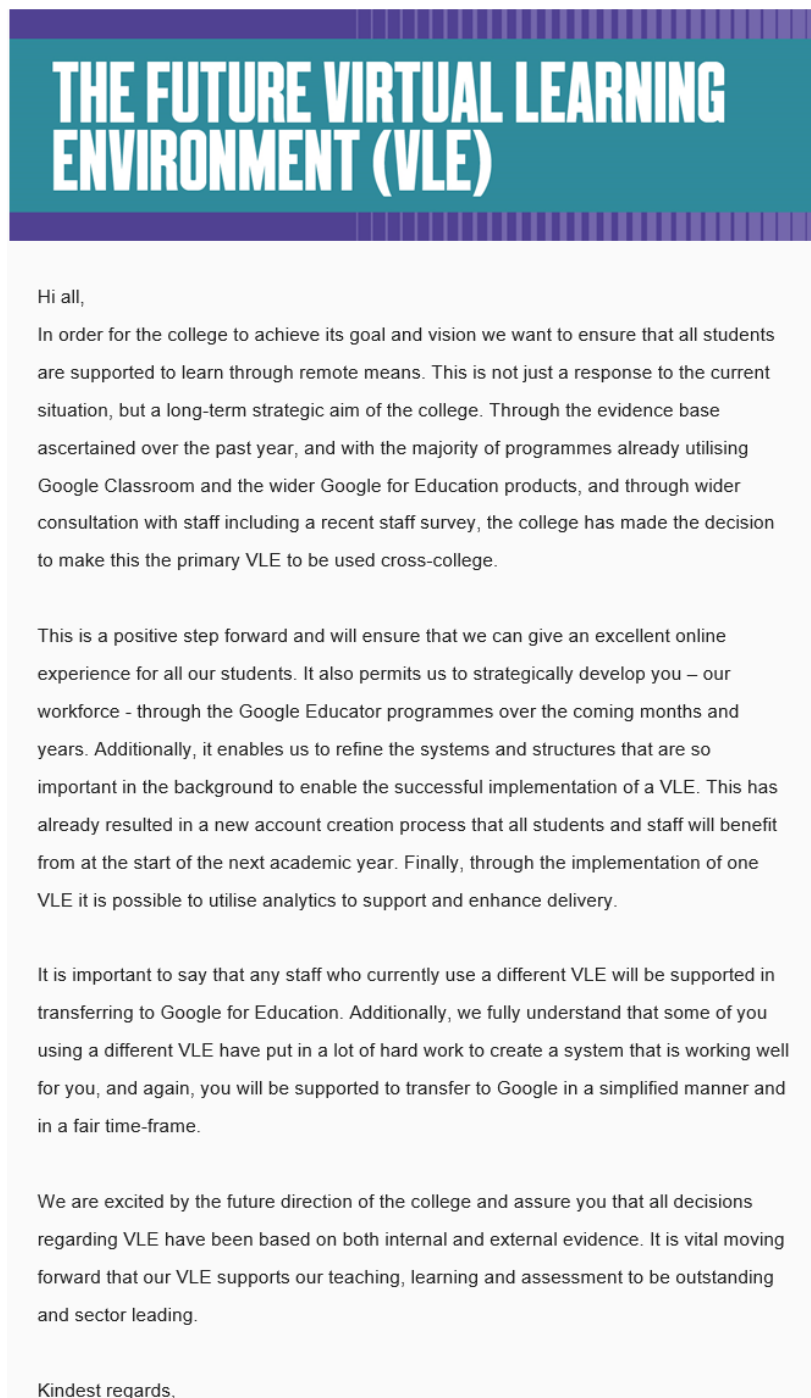


A Vision for Digital Learning

Closely linked to the above, the third and final recommendation following the research ensured that one approach to online digital learning and subsequently the VLE at the college was to be put in place. This led to the Google for Education Suite being placed at the heart of the institution for all teaching and learning activities, online synchronous and asynchronous learning. For the first time the college would have a recognisable vision for online and digital learning (Fig 9). This transition was first articulated out to staff in June 2020 and would be supported through migration over the following academic year. Moreover, this linked back to the first priority and enabled the digital development programme to be based on a set of tools that all delivery staff at the college would be required to use. The initial benefits of this have already started to have positive impact, for

example, the speed in which training can be rolled out to all staff has dramatically improved, the quality of the training materials have also improved greatly, and the ability to invest in advances in both hardware and software has proven to be one of the key positives of having one established set of tools for a VLE.

Figure 16 - Screenshot of email communications sent cross-college in June 2020



The findings from this research have had clear and tangible impacts on the practice in the college that I work at. This is in line with pragmatism and action research, as is the requirement to constantly review, evaluate and improve the processes developed. This is especially important in the current circumstances having accelerated the development of the digital development programme due to Covid-19. One of the key priorities now is to review the implementation of the digital development programme in its current form to ensure it is fit for purpose now and in the future, through the action research model there may be the requirement for an enhanced iteration of the developed programme.

Research Reflections

As discussed in the thesis methodology outlined in chapter three, the employment of reflexivity has been implemented to support the overall quality of research and support the development of myself as a researcher. Within this research study personal reflexivity, methodological reflexivity and contextual reflexivity (Olmos-Vega, et al., 2022; Walsh, 2003) were all considered. This narrative has been produced following the collation of field notes and memos recorded throughout the research, along with discussions with my research supervisor (some are included as evidence below).

Personal reflexivity refers to how my (our) unique perspectives influence the research. In terms of the current study, consideration had to be given to the fact that I have an underlying positive perspective of education technology and digital learning, and within the institution where I am employed and carried out the research, I have a responsibility to develop teaching practice and the subsequent student experience through technology. Recognising this was important in the first instance in order to remove the potential bias (i.e. wanting to accelerate the use of technology). Through reflexive processes I could self-reference (Mordal-Moen & Green, 2014) my positionality and appreciate that I do have an underlying bias. During the entirety of this research, I would ask myself questions in order to confirm my biases, for example, 'Do I believe technology could be used

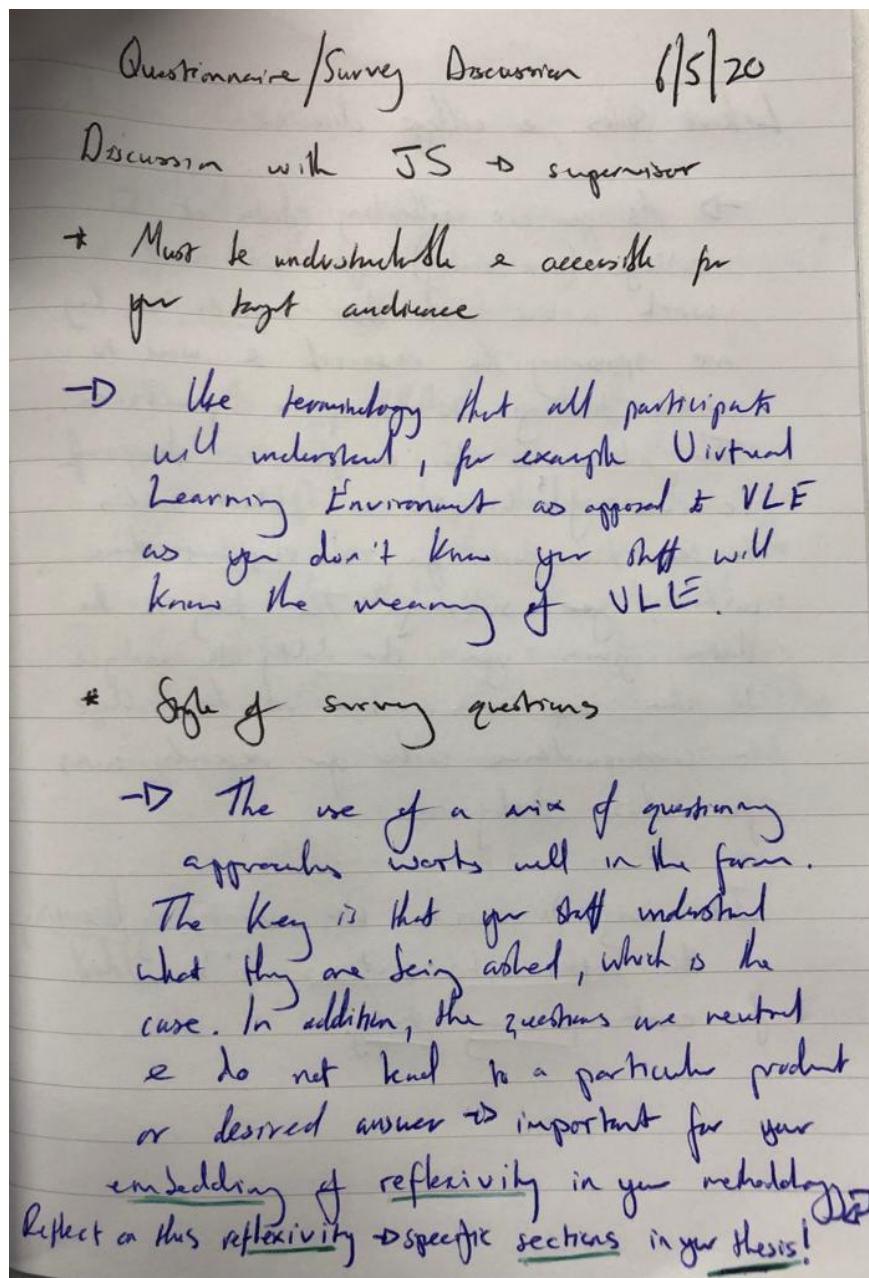
better in education?', and 'Do I want a greater focus on technology in my current institution?'. These were important questions to ask, and I had to confirm to myself that in responding yes to these questions, I needed to guard against these biases in all aspects of the study. This included designing the questionnaire, through to analysis and discussion. The impacts of such personal biases could impact on the findings from the study and the subsequent initiatives developed, so it was vital to me to acknowledge in the first instance, and then try to mitigate against them as best possible.

Another key aspect to deliberate on was the bias that the sample will have. This was at the forefront of my thoughts because everyone has their own views, opinions and beliefs about their world view, and the use of technology in their practices forms part of this. Although each individual member of the sample may not be aware of their personal epistemology and subjective views (Pintrich, 2002), I was keen to at least consider this as the researcher. For example, if the sample was taken from teachers who were pro education technology that would potentially give a different outcome to if the sample was made up of teachers against technology. I guarded against this by ensuring the sample was representative of the college, and at that point, I can't and don't want to control individual opinions and bias, as I need those to come through in the results, but in a way that is fair through the data collection strategies. That final point was important for me to recognise, that controlling all bias is not the sole aim of qualitative research, and is impossible. To learn about and construct meaning from the data collected, gathering different views and opinions is vital, but this can be improved through a representative sample as I employed here, to guard against participant bias.

The steps taken to mitigate against my own perspectives were utilising a pilot study and formulating the questions as part of the research team, to ensure that they were as neutral as possible and did not lead to a particular bias in the results. This process was important and I certainly feel helped gather quality data. I also believe that going through this process and utilising the research team (see figure 15) has enhanced me as a researcher, given me a better understanding of

qualitative research, and as I self-reflect – taken me beyond the research I carried out in previous studies when I completed a master of education programme (M Ed). Ensuring the sample was representative of the college was also important, so the views and opinions collected through the questionnaire are a representation of the college and not biased through selective sampling, i.e. only including those staff who are positive about the use of EdTech.

Figure 17 – Notes from discussion with supervisor regarding the survey



Methodological reflexivity refers to how I (we) made methodological decisions and what the implications of these were. In the current study, the main consideration was concerned with the use

of Likert scales (see figure 16) and action research (see figure 17). The college where the research was carried out would only permit the use of a four-point scale, as per directive of all internal surveys at the college. When discussing this with the relevant leaders at the college it is due to standardisation for any cross-college survey related to staff and/or students. Prior to implementing the research, and to confirm I could follow these guidelines and carry out the research at this institution, I heavily researched (see data collection section) the use of Likert scales and found no consensus that the four-point scale would impact negatively on the data collected. However, this has certainly influenced the processes I will conduct in the future when approaching institutions for research, as although in this case there was no impact, in the future it is important that methods are led by me as the researcher, not the institution.

Figure 18 – Notes from discussion with supervisor regarding Likert Scales

Likert scales & college directive

→ As you are collecting data at the college (case study) you will need to work in-line with their requests, as they are sponsoring the research & want to utilize findings to improve practices. The advice is to complete a thorough review of literature on likert scales to see how best you can implement these within your survey. The key is the data gives you the ability to analyse & then improve practice at the college in correspondence with your research aims for this study.

It may be worth also mentioning/discussing in the reflexivity sections to be added for each primary study.

Additionally related to methodological reflexivity is the use of action research (see figure 17), employed in this study. One of my key principles as a researcher in education is to ensure that the research carried out impacts on practice, process, policy and/or strategy in an institution, and the use of practical action research certainly in design aligns to that. In this study, I believe the implementation of action research was a positive and supported the outputs that resulted from the research. In addition, and due to the type of research and the societal picture at the time, the

research was completed quite quickly through the approach, enabled strategic actions to be put in place based on the findings, and resulted in a clear direction at a time when this was vital following the pandemic. Through reflexive processes I was aware of timings, and although I could not let this drive the research methods and approach, I did ask myself the following questions during introspection; 'How important is time in relation to completing this research study?', 'How important is the time it takes to complete this study to develop strategic actions at the college?'. 'Am I willing to sacrifice the quality of the research to meet time constraints?'. I was aware that these questions should not be a focus, but I had to be cognisant of them, and by at least recognising that time did play a factor I could have those conversations internally and also with my research team. It also enabled me to further reflect on the choice of action research and be sure it was the correct methodology for this study, and it was. The cyclical nature, the collaboration and sharing of power, and the need to influence practice were the key determinants, time, as discussed here was just a useful contemplation through reflexivity. I also feel that the more I am taking the time to have these internal discussions, I am improving as a researcher, by becoming more detached at times, reflecting on key processes, and developing more critically-informed views and research practices (Mordal-Moen & Green, 2014).

Throughout my reflexive discussions, I tried to distance myself from situations in order to consider the meanings from an external viewpoint (van Manen, 1991). In doing this, I was able to see clearly, and be confident that the choice of action research as the methodology and survey as the method, were the most appropriate approaches for the needs of this study. Moreover, it linked to the research philosophy and my view on what research should achieve, a change to practice. Although reflexivity helped me arrive at this stand point, it has also highlighted to me that I could improve how I keep records of my thoughts and feelings throughout each step of the research process in the future. Distancing myself from the research, I believe is an opportunity for me to develop further, explicitly confirming or challenging my beliefs at each step of the research, acknowledging that it is okay to question myself thoroughly, in fact, it is good thing. In relation to

this study, and having taken the time to be reflexive both individually and in conversation with my research team, I am confident in the methodology and methods implemented, however, improving my reflexivity throughout the decision-making processes is something I can still develop further.

Finally, and central for all action research, especially practical action research, the collaborative nature was maintained, and extended to a wider audience through the data collection method used which was a survey. This was another positive of using action research and something else that is essential to my values and principles as a researcher – inclusiveness – research is led by those within the situation (college/institution) to improve it (Schmuck, 2009).

Figure 19 – Notes from discussion with supervisor regarding action research

Action Research

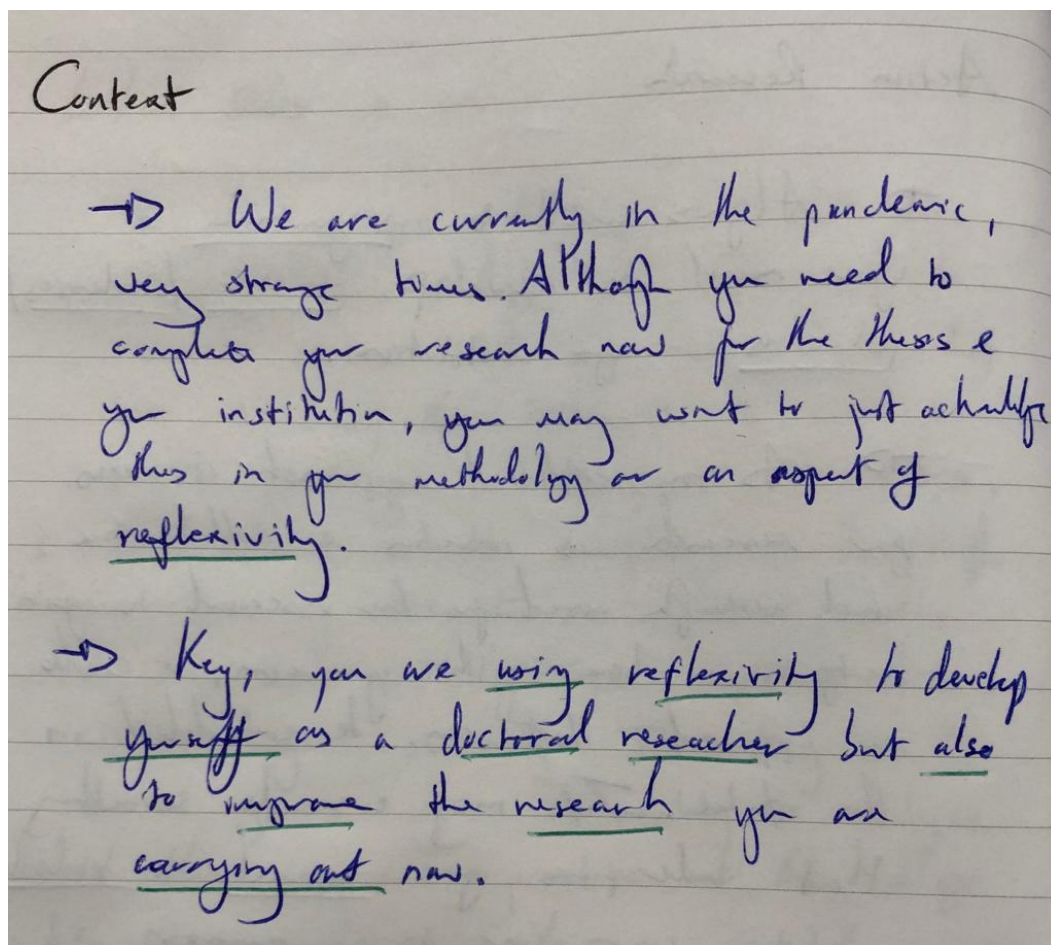
→ Aligns well to pragmatism & you need to develop practices/strategies/policies in your institution.

→ As an established approach it means your research is iterative & collaborative, and although used for his research to gain outputs in-line with your aim, it is also an approach that can be embedded in the future. It may even be something that underpins your approach to leadership in future years, or as you progress into potential senior principal roles → this may be one of your core strategies you embed cross-college.

Contextual reflexivity refers to how aspects of the context influence the research and people involved. For this study, this linked to the appreciation that the world of education was facing unprecedented times as we had moved into a global pandemic that could influence the views of participants. For example, those confident with technology as opposed to those less so. The large sample somewhat mitigated against this, and the fact that this research was to be developed in the subsequent research carried out. However, being aware of the contextual situation was important (see figure 18), and certainly a further enhancement of my own approach to research. It is undoubtedly something I will be aware of in future research and once more, I believe this supported

the current study, but also developed me as a researcher. For example, when carrying out future research in education I will ensure that sampling is representative of the wider population if I am using quantitative tools; I will carry a greater awareness of contextual perspectives during interviews and focus groups; and I will ensure where possible that triangulation is incorporated into the research, acknowledging the importance of subjectivity as a positive aspect of qualitative research (Varpio, et al., 2020).

Figure 20 – Notes from discussion with supervisor regarding the current research context



A final consideration here is the use of the notes made during meetings with my research team and supervisors that helped to shape decisions throughout the process, supporting my development as a researcher. The figures above (10 – 13) are examples of notes taken during discussions throughout the process and the impact these then had in the subsequent developments and actions. The reader will see the point for discussion (for example context in figure 13 above) that I raised with my

supervisor and research team, and the notes made from the responses. This is included to show evidence of all aspects of the development of effective research methods and strategies, and the detail I went to in collecting data in the most effective way. It also highlights the efforts I made to develop as a researcher. Much of this critical reflection has permitted me to reflect through action research cycles, interpret findings and develop as a researcher by justifying and constantly reflecting on the decisions taken throughout this research study.

Chapter 5: Research Study Two – Developing Effective Online Teaching, Learning and Assessment

Chapter 5: Research Study Two – Developing Effective Online

Teaching, Learning and Assessment

Chapter Introduction – Professional Context

Building on the previous chapter, this chapter is focused on what constitutes effective online teaching, learning and assessment practices. This aligns to the overarching aim of the thesis which is the development of online learning and pedagogy in an FE environment, and to my own personal development, through reflective narratives as a pragmatic researcher in the field of education. Interestingly, and at the time of writing, much provision had large elements of online delivery due to the Covid-19 pandemic, but the need for this research precedes the pandemic, both at the institution where the research was carried out and the wider sector. With the current requirement to deliver much more provision online, and the likely consequence of institutions wishing to utilise online and blended approaches more following the pandemic, this chapter aims to investigate noticeable themes of effective practice during online delivery to ensure high quality provision where online delivery is incorporated into an institution's curriculum. This research study was again based in one large college in the FE sector and utilised the skills and knowledge of a group of advanced practitioners related to online delivery. As with the previous study in the previous chapter, the key outcomes of this research study would influence practice in the educational institution the research was carried out. Consequently, this once again aligns to both pragmatism and action research that place importance on the impacts on practice, the ability to plan, implement and subsequently review your initiatives as crucial, making these approaches paramount to this research and the wider thesis. Although the research is underpinned both theoretically and methodologically, the key outputs for the research will be the impact in the context it is carried out, in this case understanding what constitutes effective practices in online teaching, learning and assessment environments.

Although it is acknowledged that the influence and importance of online approaches to education have been somewhat elevated and accelerated due to Covid-19, it is important to state

that enhancing learning through digital and online technologies has raised many significant issues during the pandemic, with the quality of delivery one of these. The need for the FE sector to utilise online technologies and approaches better is of paramount importance when considering the maelstrom surrounding the sector, including changes to funding often resulting in funding cuts, difficulty in recruiting staff, and the high stakes inspection framework. Moreover, the need to offer the diverse range of students options that better suit their needs and requirements must be considered now and in the future in the FE sector. This places this research study at the heart of enhancing the quality of online provision and understanding better what effective approaches look like, as online and blended approaches will only be successful when the quality is high. Certainly, at the college where the research was carried out, a key directive from the executive leadership team is for the college to be recognised for its agile approach to curriculum design and delivery, with excellence in digital and online approaches part of this, meaning this research is crucial in professional practice.

It is again accepted that the findings from this research may not be generalisable to all educational institutions but some of the key findings may be applicable and easily utilised to support other institutions develop their online practices.

Abstract

The aim of this study was to gain a better understanding of what constitutes effective online teaching, learning and assessment (TLA). The Covid-19 pandemic has placed great emphasis on the utilization of technology to deliver learning, accelerating the need to develop and enhance approaches to online pedagogy. Two focus groups were carried out with eleven staff at one FE college in the north of England who specialised in supporting and developing online practice through supportive observations and coaching. Collectively, the eleven staff selected to partake in the focus groups had completed over 220 supportive online observations and close to 350 coaching sessions. Three themes were generated following thematic analysis (Braun & Clarke, 2006) with the first

theme indicating that online TLA is different from face-to-face delivery, theme two highlighting the importance of technical skills in order to deliver effectively online, and theme three emphasizing the requirement of a non-judgemental culture for developing online practice. These themes are noteworthy for institutions and leaders supporting the use and development of online practice and should be considered when designing strategies at institutional, curriculum and individual levels.

Introduction

The terms remote, blended, online, distanced, synchronous, asynchronous have become common rhetoric over the past year in education. Much discussion has followed on the impact and effectiveness of technology to support learning, what effective online delivery and learning looks like, and what opportunities are ahead to further utilise EdTech and some form of online learning in educational institutions. The above forms the premise of this study, which aims to gain a baseline understanding of what effective online teaching, learning and assessment looks like in an applied setting, that of further education (FE) in England.

A good starting point to consider is that in most cases, colleges and other educational institutions over the past year have primarily used technology to deliver emergency remote teaching, which is not comparable with well-planned online learning (Hodges, et al., 2020). The pandemic forced institutions to work very differently, very quickly, and although naturally over the course of the pandemic institutions worked to support staff through digital training, there has continued to be a reactive and somewhat emergency feel to how technology has been used, making the comparison of online learning throughout this period (emergency remote teaching) to face-to-face teaching requested by Zimmerman (2020) somewhat fruitless. The notable issue now is gaining a better insight into what effective TLA is in relation to online provision.

Although the prominence of online learning and the use of technology has become a hot topic for discussion following the Covid-19 pandemic, there is a longer history to it, and in many ways, technology offers opportunities to support research and evidence from the educational

community. Dating back to the 2 Sigma Problem proposed by Benjamin Bloom (1984), which showed the importance of one-to-one tutoring when compared with conventional group teaching, the use of technology offers opportunities to solve the 2 Sigma problem (i.e. those receiving one-to-one tutoring are 98% more likely to achieve higher than those in the conventional group with 30 students in it). Bloom's pioneering work is well cited by others in the field of online learning, for example, Daphne Koller (2012), who discusses how technology never tires of grading work and giving feedback, no matter how many attempts students make. Although this comment was made with a little humor in mind, it is significant, as teachers can develop resources that replicate aspects of one-to-one tutoring and mastery learning that can be used by students until they are ready to progress. Technology can also dictate the next phase of learning through the assessment of students, and although this appears quite advanced, it is actually something teachers can do via the use of most virtual learning environments (VLEs) and educational programmes and software. Furthermore, the simplicity in which one-to-one tutoring can be conducted in an online space offers great potential for supporting learning.

Alternative approaches to delivery are also now more prominent due to the advanced use of technology and online learning. In their recent book 'Ten Steps to Complex Learning Third Edition' (2018), van Merriënboer & Kirschner (2018) discuss how the flipped learning approach is 'well in line with the Ten Steps' (p-316) they propose. This is very interesting and a development that goes some way to moving the discussion from EdTech and evidence-based research, to one concerned with designing the most appropriate programme of learning. In simple terms, the flipped classroom approach gives the theoretical content in advance so class time can be used for higher order learning and theoretical application (O'Flaherty & Phillips, 2015). Opportunities for teachers and curriculum leaders to utilise the flipped approach when designing programmes of study should be considered and further advance the opportunities of technology and online delivery. Examples of how the flipped approach could be implemented are the recording of presentations, short videos or practical

demonstrations that are shared with students prior to a taught session, where the content can then be analysed in greater detail during the session.

There is also the potential to focus on possibilities that are more adventurous that technology and online delivery could offer, for example the use of virtual reality (VR). In simple terms, VR replicates the real world and offers students first-person experience in such environments through different levels of immersion (Zhao, et al., 2020). VR can give students access to opportunities with high fidelity - the degree to which the simulated environment corresponds to the real world, which they would not have access to without VR. Careful planning is required to ensure that the implementation of VR supports and extends learning, for example, the degree of fidelity may differ for novice to experienced students, with the latter requiring VR environments that closely resemble real work environments (Gulikers, et al., 2005). VR used in subjects such as anatomy and physiology would immediately spring to mind and evidence suggests a positive impact for these programmes (Zhao et al, 2020), but colleges and educational institutions should consider many of the opportunities to enhance provision through the use of VR.

A plethora of research has been carried out related to the roles and competencies of online teaching practices (Martin, et al., 2019) but research is required in the applied setting of FE, to support delivery now and post-Covid-19. Furthermore, research is required specific to the post-compulsory age range in England. There is also a need to discover through this research how practice is best developed, with continuous training and support clearly a dominant issue in developing online practice (Wingo, et al., 2017), along with institutional support (Blundell, et al., 2020). Moreover, for FECs who plan to utilise aspects of online provision, this will be inspected as part of the Ofsted Education Inspection Framework (EIF), so ensuring the planning and delivery of online learning is effective is of paramount importance.

Results and Discussion

Following thematic analysis (Braun & Clarke, 2006), and careful sculpting from the researcher, three clear themes were generated from the data. These were:

- 1) Online TLA is different from face-to-face delivery
- 2) Technical skills are vital in the enablement of effective online delivery
- 3) A non-judgemental culture is important for developing online practice

Theme 1: Online TLA is different from face-to-face delivery

This first theme is salient, and gives clear indication that there is a need for a greater appreciation and understanding of effective online TLA. Hodges, et al., (2020) clearly highlights the need for greater contemplation between emergency remote teaching and effective online learning, and this theme corresponds with the requirements to understand the practice of online TLA better.

Chrissy stated:

‘...but not just like lifting what we do in a physical classroom and plonking it online, it’s about adapting it. The best teachers, yeah have the same kind of structure and progressive learning that you would find in a classroom but they haven’t just taken a typical lesson plan and are trying to re-do it in an online learning environment, they’ve adapted the resources and assessment for learning strategies...’ She continued; ‘You can tell when it is ineffective can’t you? Because the kind of activities that you would do verbally haven’t been adapted for the online classroom and you do have still, the teachers who just ask the questions and sit there, and ask and ask and ask, and are still not recognizing that students aren’t responding and haven’t tried to adapt that to online.’ (Chrissy)

The interesting aspect of this is the acknowledgment that there is clearly still the requirement for structure, and this could quite easily include principles from research into effective instruction (Rosenshine, 2012), but the important facet is how a teacher has then (re)considered

how the lesson is best delivered in an online environment. This perspective is echoed by Dean who stated:

'I think that if we were to take online lessons, and we move what we do traditionally in a classroom online, I think we can only have a limited amount of success with that. I think there will be a glass ceiling that we will reach with that...I think we have to kind of move away from this idea that we are going to move what we do in a classroom online and it's going to work like that.' (Dean)

The need to (re)consider online TLA as a specialism of its own is important, and the idea that a successful lesson delivered in a normal classroom setting can be simply replicated online is not going to support practice to be effective in online environments. Clearly aspects will be useful, potentially the structure and the embedding of strategies such as assessment for learning (AfL) for example, but only when teachers reconsider this and adapt strategies and methods to suit online delivery will the transition be successful. Sally commented '...making sure it's purposeful for online activity, not just what you would do in a classroom and let's try it online so that planning is there.' The term purposeful is interesting here when considering the planning and execution of online TLA and a really good starting point in the process of planning and adapting classroom sessions to online. For example, and referring back to Chrissy's initial quote, what is the purpose of asking questions during online delivery and is it the most suitable for what I am trying to achieve? This could be the case in a classroom session, but does it give me the same outcome during online delivery? If not, what would?

These are the sorts of questions that would help in transitioning from classroom delivery to online, supported with the appreciation that online should not simply try to replicate classroom delivery (Killen & Langer-Crame, 2021(a); Killen & Langer-Crame, 2021(b)), and in a post-pandemic world where much online practice was in response to the pandemic, there is far greater opportunity for the utilization of all aspects of online delivery in the future.

Subtheme 1 – Commonalities between online and face-to-face delivery

Although it was clear that online TLA must be conceptualised differently to face-to-face delivery, some commonalities were also evident in the data, suggesting that underlying principles of quality TLA are evident in online environments. This also suggests that the critical factor is how well teachers can adapt and re-conceptualise their planning to deliver effective sessions online. For example, the structure of a session is important whether that be during an online or face-to-face session. Kathy raised this:

‘You can always tell the sessions that are really well structured. I know we are not trying to replicate the classroom, but the best sessions have still had that really good structure.’

(Kathy)

In terms of the teaching methods and/or mode of delivery, a well-planned session that has a clear structure is required. This doesn’t mean that those beautiful moments in teaching where discussions naturally develop and traverse into aspects we may not have planned cannot happen, in fact these special moments are required in teaching and are more likely when a clear structure is evident. The structure could include a starter activity to recap on previous learning for example, which is a vital component for learning (Dunlosky, et al., 2013; Rosenshine, 2012; Szpunar, et al., 2013). This is imperative irrespective of teaching online or in a physical space. This was also supported by Chrissy who discussed how effective online TLA needed to be ‘Well designed and well structured...’ Interestingly, the efforts teachers make to do this in a physical space are likely more natural, but it is an aspect that must be replicated if quality online delivery is to be achieved.

Other key aspects associated with effective TLA were also discussed as commonalities of effective TLA in both face-to-face and online sessions. Both Damien and Nigel discussed the importance of engagement:

‘It’s engagement I see, the tools the staff are using. How the staff are delivering the applications online and how the students are participating in the tasks.’ (Damien)

‘It’s about engagement, so the most, the most rewarding lessons I’ve gone into review have been where the students have been engaged. The teacher had pitched it correctly so all the students felt engaged and they all felt they had a valid voice.’ (Nigel)

Dean also supported this by discussing further, what he believed were important during all modes of delivery:

‘Now there are still aspects that transfer across. Questioning strategies transfer across, stretch and challenge, differentiation. All the key things that underpin good TLA, carry across.’

These key terminologies often used in conjunction with the observation of TLA are important, and do indicate from the data that commonalities do exist. For example, engagement is important in both face-to-face and online delivery, this is probably not much of a surprise to anybody, and although engagement and motivation do not necessarily lead to learning (Nuthall, 2007; Hendrick & Heal, 2020), the views of the participants in this study are based on their experiences over time, not just in one session. Furthermore, learning cannot happen without attention as information cannot be processed in working memory (Baddeley & Hitch, 1974), and attention is far more likely when students are engaged. Moreover, questioning has been regularly discussed in the effective teaching literature and research literature (Al-Zahrani & Al-Bargi, 2017; Doherty, 2017; Wilen & Clegg, 1986) and highlights further that when executed effectively it underpins effective TLA in both face-to-face and online sessions.

The final commonality is that of the relationship dynamics developed between the teacher and the students, and between the students as a group. Emergency remote teaching was never going to, or supposed to replace face-to-face and on campus delivery, and the missing social aspects

of education are certainly something that have proven difficult for students. This includes the connections created with peers and teachers during on campus learning. This was further exacerbated in September 2020 when students commenced the majority of their learning in online environments in many FE and HE institutions, having never met their peers or teachers in a face-to-face setting. Sally raised this during one of the focus groups:

‘There’s been a common thing where staff have said they’ve felt their online learning experience has been, not better, but easier with students they have got a relationship with. So, they might have taught them in the classroom or they teach them for quite significant periods.’

Gail also agreed with Sally and added ‘The lessons where the teacher really knows the students...’ underpinned stronger and more effective online sessions.

This is interesting and clearly, how a teacher builds an environment that promotes learning is significant and underpins learning and progress to some extent. The large digital insights surveys carried out by Jisc in both FE and HE settings found students struggled with the ‘lack of interactivity’ and ‘missed the collaborative and social aspects of learning’ in FE (Killen & Langer-Crame, 2021(a)). In HE students ‘saw the social aspects of their experience as being as important as their learning’, and found it hard to engage with peers they didn’t know or ask questions of tutors they hadn’t met’ (Killen & Langer-Crame, 2021(b)). When creating positive environments for learning it is important to consider the methods used during face-to-face delivery in comparison to online are likely very different, and a starting point for institutions is to ensure that their online provision is just that, and goes through rigorous planning. What it cannot be is simply moving previously delivered face-to-face sessions to an online mode; that is where relationships and dynamics will suffer, amongst many other factors.

Subtheme 2 – Positives of online delivery

Data also indicated a clear theme related to the positive aspects associated with online delivery, with assessment underpinning this. For example, Dean stated:

‘I think, again going back to what we mentioned on formative and the use of EdTech, I think that some of the tools make it easier to assess formatively, and in certain instances summatively as well, I think it makes it easier and is supplementary.’

Furthermore, Damien stated, ‘Assessment for learning, retrieval practice it’s brilliant. We can test students and have short sharp quizzes’, and Beth added, ‘Opportunities for really effective formative assessment are really, I think enabled by a lot of online tools.’

Assessment, and more specifically assessment for learning and formative assessment have been heavily researched and shown to be vital in supporting learning and student progress (Black, et al., 2003; Black & Wiliam, 1998). Of interest here is the notion that assessment is certainly something that can be enhanced in an online environment. Linked to this is how effectively teachers delivering online can use tools to clearly assess progress throughout, through the implementation of simple technology. Beth added:

‘In particularly effective online TLA they (teachers) have actually been able to monitor and track learner progress in a more efficient and effective way then you could ever do in a classroom. So, with using things such as Padlets, Google Docs, where you can literally monitor what all students are doing at once. Where you get those magic moments of that live feedback and you can see the impact and progress taking place.’

Gail agreed that ‘knowing what students contributed was really useful.’ This notion of being able to monitor progress live through a range of tools to give real time feedback is essential, and should be considered by educational leaders and institutions in the future. When planning the curriculum, it is crucial that online delivery and learning is not simply incorporated into FE and HE timetables as something that is just done, because we have to, it should be used to systematically

improve the learning experience for students. Assessment during online delivery clearly has many benefits, linked to students, teachers and institutions (Alruwais, et al., 2018), and this should be utilised in the planning and subsequent delivery of an institution's curriculum. The inspectorate in FE also acknowledges this, and quite rightly, so that online learning is used to enhance the curriculum (Ofsted, 2021).

Further positives were related to the opportunities to enhance learning away from the teacher, during students' independent time. Damien linked this to homework, 'Homework online through Google Classroom. They can no longer say they've lost their homework or the dog has eaten my homework', with Beth in agreement, 'I think there is a real opportunity for independent learning and for student centered learning'. This is certainly a perceived positive on the use of effective online learning methods, with the potential to challenge and support students to develop mastery (Koller, 2012); although it is acknowledge that this will take time with further research needed on how best to maximise the effectiveness and impact of VLEs to support all students (Demian & Morrice, 2012; Maltby & Mackie, 2009).

Theme 2: Technical Skills Crucial

This theme is key to understanding the potential barriers that educational institutions must address if they are to utilise online TLA effectively in the future. Clearly, the technical skills of their workforce are paramount in ensuring that learning and the student experience is enhanced through online methods, not hindered. The initial starting point has to be an analysis of their workforce's current levels. Beth highlights perfectly the importance of technical skills:

'But I do think that this is a question of staff skill and capacity, because I think there are staff who do formative assessment very well in a classroom that is not translating to online learning at all. And I think it is because some of them don't have the ICT skills.'

Fern added:

‘So for me, the sessions that have been difficult, are the sessions where you can’t actually see what the learners are doing, and the teacher can’t see it either as they are still not using the collaborative tools. So, like has progress taken place, has learning taken place, I don’t know because I can’t see what the learners are doing, how do you know?’ (Fern)

In face-to-face teaching, teachers require a knowledge of their subject and a knowledge of the pedagogy of how best to deliver it, as proposed by Shulman (1986). When teaching online this is not enough, as the teacher must also have the skillset and confidence to be able to utilise a range of education technology in order to deliver effective learning. This relates to the TPACK framework produced by Mishra and Koehler (2006), that identifies technology as a vital component in the relationship between content and pedagogy. For example, understanding the need to assess learning is fundamental and something that teachers rely on, however, for teachers to accomplish this effectively during online delivery requires the development of technical skills. This third priority, one of technical competence is key, and for institutions to fully utilise aspects of online and digital learning, the support for tutors and lecturers is essential (Killen & Langer-Crame, 2021(a)).

Both Damien and Beth then highlighted how staff can’t do certain pedagogical aspects due to their lack of technical ability, ‘Differentiation, was a big area I picked up on a lot (during online delivery) because a lot of the online lessons were the same tasks, same pace to the same amount of students, all the time.’ (Damien); Beth added, ‘I have staff who want to do things, and they want to do it online, and they want to do it well, but they actually don’t know how’. This is striking and clearly indicates that effective online delivery, in any form, simply cannot be achieved without the necessary technical skills in the implementation of education technology (Mishra & Koehler, 2006). No matter how good a teacher is during face-to-face on campus teaching; in an online environment the importance of technical skills is vital. Developing the skills, confidence and use of technology has been cited as a top priority of teacher professional development, to ensure online delivery goes

beyond simply replicating their current practice in an online medium (Laurillard & Masterman, 2009). Moreover, and specific to the FE sector, the Education and Training Foundation's professional standards make reference to the use of technology (Education and Training Foundation, 2014) with the subsequent creation of a Digital Teaching Professional Framework, aimed at developing the skills and competencies of staff through a tiered training offer (Education and Training Foundation, 2018). Initiatives such as this will play a crucial role in supporting colleges and other institutions to equip staff with the necessary technical skills to deliver effective online learning.

Related to developing technical skills vital for delivering effectively online, the confidence staff have is also important. Fern stated:

'I'd say as well that some staff don't have the confidence to show their learners how to use the tools, and obviously sometimes you have to go through that barrier. Some staff find that really frightening I suppose because they are not confident...'

Both Beth and Sally agreed, but also introduced the willingness of staff to engage in meaningful development to ensure they have the necessary skills:

'I suppose it comes to that confidence of the teacher using different applications and IT and things, and that 'want' I suppose.' (Sally)

'There is, I think a barrier of a willingness but also capacity in feeling that you can do it.'

(Beth)

All of the above raise interesting questions to ponder, especially Beth's closing remarks relating to staff feeling that they can utilise technology effectively. Bandura (1977) discussed how someone's self-efficacy impacts on their success on a task with Compeau and Higgins (1995) stating that computer self-efficacy is no different, and related directly to the beliefs someone has on their competence in using technology. Moreover, research suggests that self-efficacy is the most important factor in the decision by instructors when integrating aspects of online delivery (Zhen, et

al., 2008), and that skill and perceived skill played a huge part in the uptake and willingness for online learning (Shea, 2007; Tabata & Johnsrud, 2008). This barrier of self-efficacy is significant, and if we are to move education beyond the brink of transformation through technology (Laurillard, 2008) more thought is required on how best to deal with this issue.

Theme 3 – Non-judgemental culture vital for developing online practice

This theme is crucial for the developmental aspects that are so important to institutions embarking on a digital transformation. It was abundantly evident during the focus groups and subsequent analysis that a non-judgemental culture is essential in the long-term development of a workforce. The term non-judgemental is used throughout the analysis as an encompassing term that constitutes both aspects of mentoring and coaching, as often differences between these terms are not clear (Garvey, et al., 2018). Evidently from the data analysis, support that was non-judgemental was imperative, Violet and Fern highlight this:

‘I put straight away peer observation because we’ve done so much CPD around everything and it’s, it’s about having the staff understand how to use it and how to actually go about online learning. What sort of questioning do you do? How do you do the questioning? What about all the different barriers and how do you overcome the barriers? I mean when we first start teaching we do peer observation, that’s the first thing we do...and I just think that would help enormously.’ (Violet)

Fern added:

‘So definitely not judgemental, we shouldn’t be making any judgements whatsoever. We should be there as a colleague to learn alongside people and to collaborate. We should not only be working with people who are struggling we should be working with anybody who volunteers who wants to. We should be doing a coaching cycle, and then once we’ve done amazing things with that person then we spread that throughout the rest of the faculty and

college, and then that's the ripple effect that Kathy was talking about and it spreads like wildfire and you celebrate those wins.' (Fern)

The efficacy of some approaches to observation, especially where quality assurance and performative evaluations feature prominently, have long been questioned in the research literature (Edgington, 2013; O'Leary, 2013 a; O'Leary, 2013 b; O'Leary & Brooks, 2014). Armour and Makopoulou (2012); and Boocock (2014), point toward a move from top-down approaches to mutual developmental approaches focused on long-term improvements not short-term fixes. This is echoed by Villeneuve-Smith, West, & Bhinder, (2009) who discuss how communities of practice promote an honest approach to discussion and reflection and develop staffs' holistic ideology to their teaching (Villeneuve-Smith, West, & Bhinder, 2009). These approaches certainly correspond with the discussions in the focus groups, with a clear emphasis on developmental and non-judgemental approaches to develop the technical skills and confidence of staff. Related to Violet's point, and the non-judgemental point raised by Fern, O'Leary & Savage's (2020) cycle of peer observation is an approach that may be useful in the process of developing technical skills and confidence pertinent to online and blended delivery. This, among other non-judgemental approaches to development should be a focus of research in the future, specifically related to the praxis of online teaching and learning.

Several participants then also discussed the importance of building relationships with staff, ensuring that they felt comfortable during the developmental process. For example, Sally focused on empowerment, 'It's about being empowered and empowering others as well to recognise their strengths.' Kathy and Fern both emphasised the importance of supporting staff and ensuring they are not afraid to make mistakes, '...I want them to see it's about, sort of, you know embracing it and looking and moving forward and not being worried if it doesn't quite go right, and that's the thing I've tried to push with them (staff) - like you'd say with the students, it's okay to make mistakes.'

(Kathy). Fern then agreed strongly, 'In fact it's good to make mistakes...it's about changing that mindset as everyone has said.' (Fern). Nigel continued 'it's about that...being relatable, it's about that relationship'.

This data highlights the importance of the method used to develop the technical skills of teachers, with relationships likely to prosper through non-judgemental methods. O'Leary (2020) discusses through the work of Foucault (1980) how approaches to observation based on quality assurance inevitably connect to power. Immediately once the approach of observation becomes non-judgemental, as discussed by the participants here, the notion of power soon disappears, as does the fear and reduced self-esteem of teachers (Boocock, 2014), harvesting positive relationships. These relationships are vital for supporting teachers, some with very little experience and confidence, to feel supported in what for some is learning a completely new set of skills. In many respects, it is like having to do an additional module as part of a teaching qualification several years after completing a given teacher training qualification. This underpins the importance of relationships in supporting teachers of all experiences to commit to digital training. Moreover, the belief individuals have about their ability and capability to utilise digital and online learning plays a huge part in their decision to implement these into their practice (Zhen, et al., 2008).

Dean added the importance of self-reflection to support the developmental process:

'For me, the number one thing I always try to get staff to do is developing that critical self-reflection. If they are able to critically reflect on their own practice, identify what's gone well, what's not gone so well, identify strategies to overcome that, that's probably where I come in as a coach to suggest strategies, but making them feel comfortable they can take those risks.' (Dean)

The salient aspect of this is the fact that Dean alludes to suggesting strategies, and making staff feel comfortable to take risks, adding further weight to the requirement to ensure approaches and methods are developmental and non-judgemental. Moreover, staff are more likely to take risks

and engage in development when they feel part of the process, as opposed to having development 'done to them' to remediate practice, they are supported to develop their holistic ideology to teaching (Villeneuve-Smith, et al., 2009).

Subtheme 1 - Barriers for developing staff

Although discussions in the focus groups focused on the development of staff, the barriers that inhibit this development became clear within the data. The first of these barriers was centered around the insecurity of staff, discussed below:

'There's a lot of insecurity. I think there is a lot of worry. I think there is a lot of anxiety amongst staff that online learning is going to replace classroom and practical learning. I think they see it as almost like signing their own death warrant. The theory would be that if you don't need a classroom the number of students you can have in class is limitless and only restricted by your broadband. I think that maybe that for some members of staff they are worried about job security...they see it as this is going to replace us as teachers.'

Fern and Beth then discussed how insecurity can manifest out of the need to report on developmental needs, with staff almost wary of asking for help due to the worry of this being used against them in the future. Fern commented, '...between the coach and the coachee or whatever, there should be, we should be allowed some form of confidentiality. So that staff aren't afraid to come to us and that it's not, something that the quality manager is breathing down their neck on. Because otherwise they don't come and that is something I feel quite strongly about'. Beth also agreed with this. 'I've just been asked again to give an overview of someone who is on an action plan following a learning visit on Friday.'

Insecurity can negatively influence any workforce for a range of reasons. Here, the discussions focused on how the development of online practice may actually lead to reduced teacher numbers, and insecurity about 'being reported on', even in cases where staff proactively

wish to engage in developmental activities. Interestingly here, the focus should be on why staff feel insecure, and how the culture at an institution is imperative. Firstly, technology is there to support teachers, and the likelihood of teachers being replaced by technology is largely overestimated (Clark, 2020). Moreover, staff should be commended for engaging in developmental practices, where too often these opportunities are lacking and often constrained by time (Riley & Stoll, 2005), not feel threatened by engaging in development. Therefore, the culture developed at an institution is essential in supporting development and learning overtime (Darling-Hammond, et al., 2017). This culture includes values, the underlying set of norms, traditions, even logos and institutional history, and how all of these create the emotional ethos at an institution (Peterson & Deal, 2009). Moreover, for culture to harvest learning and enable teachers to engage in meaningful development, trust is a vital resource (Schneider, 2003; Villeneuve-Smith, et al., 2009) to support teachers with ongoing development and the learning of new habits to enhance practice (William, 2016). Furthermore, Timperley (2008) also discussed the importance of trust in her extensive review into successful professional learning, as well as stating that there must be multiple opportunities for teachers to learn something new and reflect on the impact of this in practice. This is certainly fundamental to the use of EdTech and institutions must build this understanding of teacher development into their approach.

The importance of an institutions' culture cannot be underestimated in supporting development and teacher learning practices. Evidence now shows that where professional environments are more supportive teachers will continue to develop their practice after three years, as opposed to teachers in less supportive environments, which leads to a decline in effectiveness (Kraft & Papay, 2014). Ko, et al. (2014) also highlight the importance of engendering a culture of professional debate and developmental approaches to teacher development.

Time was also another barrier that became apparent following the focus groups, with Damien, Kathy and Dean intimating time is a crucial aspect to get right for any successful

development. Damien stated, 'It's the engaging with that technology that sometimes may seem scary to them (staff)...it's also giving staff the time to learn these new skills and develop. Not all staff are at the same level, that's one of the main issues, getting them to try new things and giving them the time to do it, and giving them the time to develop things online that is going to work and benefit the students.' Dean then agreed with this, 'I'd second that. Time is a big one.' Kathy also commented, 'It's making sure we've got that time to set aside to invest in CPD.'

Time specifically to invest in tailored CPD, focused on developing the use of education technology to support online delivery has not always been high on the priority list, with more emphasis focused on developing the local virtual learning environment (Laurillard & Masterman, 2009). This is a top priority for institutions if they wish to benefit longitudinally through the development of online practices. Learning takes time, and must be underpinned by a supportive culture that fosters development, taking into consideration staff confidence, initial skill level and self-efficacy, as these determine the likelihood of staff engaging in development related to online practices (Shea, 2007; Tabata & Johnsrud, 2008; Zhen, et al., 2008).

There will always be barriers to development, and the maelstrom that surrounds the FE sector does make life complicated for FECs. However, it is imperative that institutions place a high value on development, and create spaces for teachers to be creative, try new initiatives, reflect on their practice and understand the impact of new approaches on their effectiveness. This is essential for institutions in developing the use of online practices as well as all teacher development. Moreover, the commitment to staff development must be a long-term initiative and strategy, one that understands development takes time, and that staff will need this time to research, practice, implement and reflect on new approaches and techniques (Darling-Hammond, et al., 2020). This is certainly the case with the development of digital skills to enhance learning through effective use of EdTech.

Conclusion

This study was focused on shedding light on effective online TLA, following the increased implementation of this due to Covid-19. Moreover, the findings from the study also support the future planning and use of online aspects of learning, with many institutions likely to keep some aspects, especially further and higher educational institutions.

Following two focus groups with eleven specialists in the development of online practice at one large FEC in the north of England, three themes were generated following the steps set out by Braun and Clarke (2006). The first theme was the need to appreciate online TLA as different from face-to-face delivery, where greater consideration is given to the planning and implementation of online aspects into a learning programme. This should be a key priority. Simply taking a session that previously would have been a face-to-face session and moving it online, which was required at the onset of the pandemic as we moved into emergency remote teaching (Hodges, et al., 2020), now requires much greater thought and planning to be successful. In many respects, the pedagogy of online sessions must be considered with clear thought given to the outcomes of the session, as is the case for face-to-face sessions. There were two subthemes from the data, with the first indicating that some commonalities do transfer, for example, the planning of sessions, engagement, and relationship dynamics. The second subtheme established that teaching online does offer many positives in the way assessment and retrieval practice can be incorporated easily.

Theme two identified how crucial technical skills are when utilising online approaches. Clearly, if a staff workforce does not have the technical skills to deliver online then the effectiveness of each session will be significantly reduced, for example, if they do not have the capacity to use software that enables effective formative assessment. If institutions and teachers are serious about utilising aspects of online learning in the future, it has to be appreciated that not only will staff need good subject and pedagogical knowledge, they will also need the skillset and confidence to utilise online tools and software.

This links to the third theme which was based on the need for a non-judgemental culture in order to develop online practice. Committing to this will be imperative for institutions to ensure that staff feel supported to develop overtime. This was further highlighted by the subtheme that indicated how insecurity can be a detrimental barrier to development for staff, and will inhibit how they develop their online skills and confidence.

This study gives early insights into what effective TLA and use of online methods are, supporting institutions to develop and lead a digital transformation. Further research should focus on the lived experiences of those who have developed their practice and utilisation of online methods to enhance their teaching and their students' learning and assessment.

Conceptual Mapping

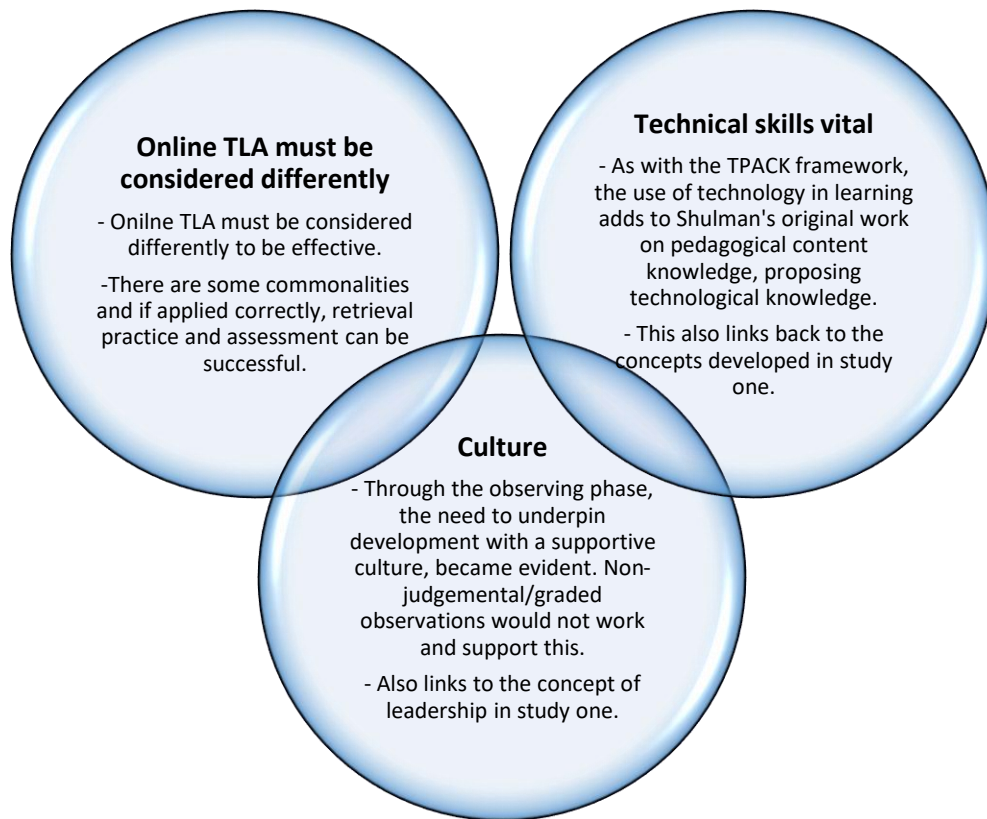
The process of conceptual mapping during study one was important for the subsequent actions following that study, including the development of the first iteration of the Digital Development Programme. Moreover, the mapping helped to direct aspects of the current study, and progressed to the observing phase of the action research cycle. Observing in this study was gathering the valued perceptions of the experts through two focus groups. It was also a deliberate act to move from a survey that was used to explore in the first instance, to a focus group that narrows the sample size, but enables a greater depth of examination (Braun & Clarke, 2013; Bryman, 2016).

Conceptual mapping in this study was slightly different from the first study, with the concepts based largely on the themes developed through thematic analysis (see this section for detailed overview). However, the process and rationale for conducting conceptual mapping was the same, to clarify complex ideas (Novak & Cañas, 2008), create connections between concepts (Nesbit & Adesope, 2006), ensure a structure for this research and subsequent research is established (Buzan, 2006), and to guide the future research (Healey, et al., 2010).

During this observing phase, defined through the thoughts and perceptions of the chosen sample size, who were the keepers of this knowledge through their observations of digital and online teaching, learning and assessment; the depth of exploration progressed the concepts developed following study one (chapter 4). The concepts from study one were high-level but were valuable for establishing the key actions at the end of that study, but I was also keen to utilise those concepts to shape this study. Comparing the concept of digital development from study one, the concepts of understanding online teaching, learning and assessment to be different and the importance of technical skills developed through this study offers a relevant progression. In addition, the concept of leadership has now been developed and links to the third main concept from this study, which is development must be underpinned by a non-judgemental culture. This is key and links to leadership, so the transition and progression through study one and two becomes more evident, and informs the choices and actions discussed in the next section – Links to Professional Practice.

Reflecting on this process was useful throughout, aligned my thinking and made sense of all the data at a high-level to give clear focus to the subsequent actions, aligning to pragmatism and action research. In terms of the observing phase of action research and conceptual development, study two was concerned with observing and gathering evidence to reflect on the success of the initiatives implemented following study one. The views of the participants were vital as they played the role of the observers in many respects, and as I reflect now the decision to purposefully chose the sample was vital and a good decision. Through the analysis and interpretation of data, actions were established (see next section) to develop practices, which would not have been possible without the detailed observations from the participants that led to clear themes resulting in action. The figure below shows the concept map for study two.

Figure 21 - Concept map study two



Links to Professional Practice – Impacts on Practice

This research study has again produced outcomes that will immediately impact on practice in the context of the research. The first theme is the importance of greater consideration when planning and implementing online aspects into learning programmes, both from a curriculum planning perspective and from a delivery perspective. Related to this The Sheffield College have continued the ongoing digital development programme to firstly give staff the necessary skills and confidence to deliver and utilise digital tools. Moreover, the college have continued to offer bespoke training for leaders as well as teachers in the planning and utilisation of online modalities, for example, a dedicated curriculum leader session was developed and delivered to support leaders in planning and best utilising approaches to online and blended learning. These approaches have supported leaders and teachers in planning appropriately when contemplating online provision, be it fully online or as blended provision.


Theme two identified the importance of technical skills for online delivery. Following the first research study the devised and implemented digital development programme has had great success at the college. However, at this point the programme was reviewed to ensure it is fit for purpose to enhance our teaching workforce's digital skills, supporting them in delivering online and blended provision now and in the future. Moreover, and closely linked with the third theme concerning non-judgemental cultures has been a change to the Teaching, Learning and Assessment Improvement Policy, signed off by the executive team and governing body to support a process called online reviews, which are non-graded observations of online practice (see appendix 3). This approach to supporting and developing the practise of online delivery, especially as this was new for many staff, has been warmly received and had great impact cross-college. The research carried out as part of this doctorate directly impacted on the change of policy, subsequently impacting on the development of staff and the quality of online provision at the college. The non-judgemental culture has afforded the advanced practitioners and coaching team at the college greater opportunities to work closely in a trusted way with staff. Although a plethora of research indicates the value of non-graded observations, implementing this for our online provision was a big step at the college and only possible because of the findings of this research. Subsequently the college have seen vast improvements in all aspects of online, including blended approaches to learning. Accepting that correlation and causation are not the same, and many variables impact on outcomes at any educational institution, the fact the college outcome data has continued to improve throughout the pandemic is testament to the quality of online delivery.

Further initiatives introduced following themes two and three were innovative approaches to engage staff in various developmental opportunities. For example, regular online meetings to share best practice, and a community of practice was introduced to further enhance the culture of learning related to technology (Fig 18). These new initiatives supported the development of practice, but importantly this was achieved through informal and trusted networks related to development. Staff felt a part of the journey and were encouraged to share their stories.

Figure 22 - Education Technology Community of Practice


EdTech Community of Practice ▾
98 members

Chat Files Tasks


 [Redacted] 28 Sept, 16:59 Follow

Anyone else having problems posting on classrooms, a couple of people have asked me for help because they can't post. Mine are OK gor now.


21

 [Redacted] 29 Sept, 15:09


[Redacted] could you add me to one of your classes and see if I can copy from there please
It probably won't make a difference but worth a try


 [Redacted] 29 Sept, 15:12

I've asked Catrin if I can join your Meet on Friday(?) There is a possible issue we have noticed that could be affecting you. I can go through it in more detail by showing you all


 [Redacted] 29 Sept, 15:13

Ok

 1

 [Redacted] 29 Sept, 16:41


Will do [Redacted]

 [Redacted] 29 Sept, 17:41


Darn, it didn't work :(Thank you [Redacted]
Worth a try though

EdTech Community of Practice ▾
98 members

Chat Files Tasks


 [Redacted] 11 Jan, 12:25

Does anyone have any handy instructions for connecting a student's iphone to their college email account, please?

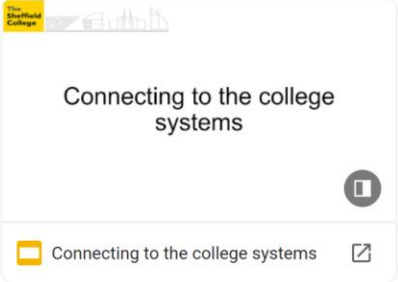
 [Redacted] 11 Jan, 12:42

1. Go to Settings > Mail, then tap Accounts.
2. Tap Add Account, then select your email provider.
3. Enter your email address and password.
4. If you see Next, tap it and wait for Mail to verify your account.
5. If you see Save, tap it.

If you can't see your email provider, tap Other to add your account manually.


 [Redacted] 11 Jan, 12:43

https://docs.google.com/presentation/d/1TBTUNXeb8PnXH2wWgrKCBH6VcermQjdFEiM1aK_oBsA/edit?usp=drivesdk



Connecting to the college systems

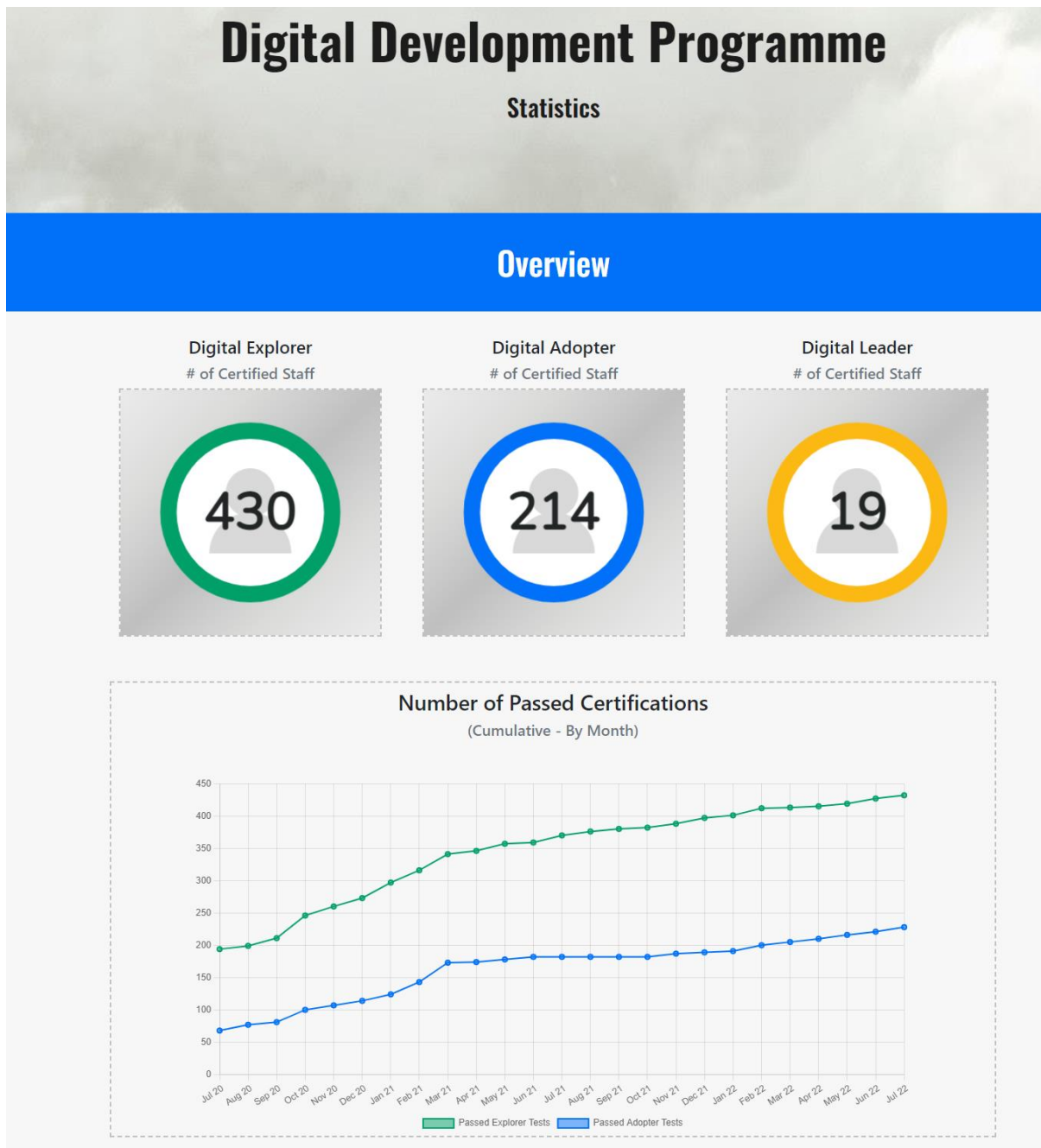
Connecting to the college systems

 [Redacted] 11 Jan, 13:37

Thank you!

The final tangible impact was the creation of an accessible website so the participation and success in the digital development programme could be viewed at all levels of the organisation. This was a positive move and ensured that the engagement in the programme of digital development was held on a high pedestal (Fig 19).

Figure 23 - Digital Development Programme Statistics



Reflecting on the initial launch of the Digital Development Programme as an outcome of the previous research study (see chapter 4), improvements could be made to enhance the programme further. This was following the findings in the current research study, and my own review of the first iteration of the programme.

Firstly, with staff accessing the content in the programme at their own convenience, sessions were becoming more asynchronous. The benefit of this was the flexibility afforded to staff giving them the ability to work through materials at their own pace (Muilenburg & Berge, 2005) and reducing the inclusivity challenge of synchronous learning (Simonson, et al., 2019) which was pertinent in my thought process due to the vast differential in staffs' contracts and availability. However, and also in my thoughts following reflection, was ensuring staff still had the opportunity to meet with the Learning and Development Coaches (LDCs) if they wanted more support or had any follow up questions, ensuring that they were not overwhelmed or isolated (Hrastinski, 2008). This then led to a programme of work in which I needed to improve the quality of the content and training videos and update the programme overtime. My thoughts during this process centred around giving more opportunities for staff to engage asynchronously with the devised content developed following the previous study, through enhancing the quality of the content, guided by the evidence base of multimedia learning. This process subsequently entailed reviewing and developing all aspects of the content, and what would be covered in each subset of learning materials. For example, within the digital explorer level the content for Google Classroom would need to be re-developed, resulting in content that could be easily digestible into learning segments, resulting in content such as creating a new classroom; changing the name and theme and inviting students to a classroom. Going through the process was beneficial, and pertinent during this reflection was my vast experiences in the sector, which was valuable and gave insights into the difficulty of leading teacher CPD in a large college. With the vast needs of curriculum areas, access to rooms,

requirements of awarding bodies, and varying staff contracts, arranging regular and ongoing CPD is difficult, especially considering the frequency required to see improvements to practice.

Linked to the above, and a further improvement was the need to develop a system that would recognise the progress staff had made. My thought process here was to make it simple for those who had worked through the programme to gain recognition of this, aligning to meaningful and ongoing development as opposed to sheep dip CPD (Scales, 2011). This was a vital consideration when initially devising the programme. To commence with this, I devised simple badges for the levels of the programme, which would be sent to staff when they had successfully completed a level (see Fig 20). As with all aspects of the programme, this process would be reflected on to gather impact and contemplate future improvements. Interestingly, and at the time of writing, a funded report at the University of Newcastle Australia discussed the positive aspects of using digital badges within a teacher education programme¹⁶. Within the Digital Development Programme, certainly at this stage, my thought process was more related to one of acknowledgement for staff, and to emphasise that the development was an ongoing process. Some of the issues related to badges and motivation (Bates, 2015; Hamari, et al., 2016) were not applicable at this stage.

Finally, and to support with all of the above, the data reporting site was developed at this stage so that the progress of all staff across the institution could be monitored. I was keen to have the programme endemic across the college, but wanted staff to 'buy-in' through their own professional outlook, as opposed from using terms such as mandatory. However, the reporting site was built to enable me to have an overview of engagement and progress, and to gather feedback to develop the programme further. All of this was in correspondence with the action research methodology, constantly reflecting and reviewing the programme, to develop and enhance in future iterations. This also linked back to my philosophy of pragmatism, and wanting to impact on practice through the research completed.

¹⁶ The report can be accessed [here](#).

Figure 24 - Digital Explorer Badge



Research Reflections

As with the previous study, reflexivity was employed to improve both the quality of the research and support my own development as a researcher. Reflexivity refers to the processes of self-conscious critique, appraisal and evaluation of subjective and contextual influence throughout the research process (Varpio, et al., 2020).

Some of the points raised within study one are applicable once more here. For example, once again personal reflexivity established that I had to recognise I have a positive perspective on how technology can enhance learning and the student experience. It was important for me to be aware of this as it resulted in me working closely with my research team to ensure the focus group questions were free from bias. This actually led to the production of interview and focus groups guides (see figure 16) that were developed through an iterative process with my supervisory team.

As with personal reflexivity, contextual reflexivity mirrored much of the same contents as the previous study, related to the Covid-19 pandemic. The main difference at the time of this study was the certainty that the pandemic was going to last for years as opposed to months.

Figure 25 - Notes from discussion with supervisor regarding reducing bias during the focus groups

Study 2 → Final Focus Group Prep 12/2/21
Discussion with JS → Supervisor
Reducing bias during focus groups (FG)
→ The FG guide is good & doesn't lead the conversation in anyway.
→ You may wish to add this in the appendices so your examiners can view it.
→ The questions are not leading and the probe & prompt columns are really useful, if they are required during the FGs.
→ The work completed to establish the above is showing ^(my) your development as a researcher → make sure you continue to link to reflexivity throughout, in this case personal & contextual reflexivity.

Methodological reflexivity was more aligned with the modality of data collection as opposed to the methods used. This was actually interesting, and in some ways, corresponded with the actual research purpose of the thesis linked to effective use of education and digital technology. The main method of data collection for this study was focus groups, which as a researcher I have experience with and carried out on several occasions, including the M Ed I completed prior to my doctorate. However, more planning was required due to the need to complete the focus groups online due to

Covid-19. This resulted in far greater planning, as not only did I have to plan the content, I had to ensure that the technology used would enable accurate analysis. This resulted in several pilots carried out to test and evaluate different online conferencing tools, to ensure the most appropriate was used to support with the subsequent data analysis (see figure 24). This was somewhat new, as I have always carried out pilot studies prior to full data collection, but this was to test the technology available. Interestingly, at the time, the major video conferencing tools were releasing updates with regularity, and this had to be factored into my decisions. For example, on screen captions were just becoming available, varying screen views were being developed at pace, enabling a clear focus on the speaker. The most important aspect, and although now it is taken for granted, at the time of the research not all free versions of conferencing tools permitted the recording of the meeting. Following researching and piloting several options, my choice was Google Meet, which had developed the ability to record both group and individual speakers at the time of the research. Interestingly, and following the data analysis of both focus groups, utilising technology to complete focus groups and/or interviews is certainly something I will consider in the future as they have many benefits. For example, the ease in which participants can access the meeting online enables participants to join from anywhere in the world at a time convenient to them, offering greater opportunities in the sampling for research. Moreover, the ease in which the meetings can be recorded, stored, analysed and now even transcribed is excellent, and something I will definitely utilise more in the future.

Figure 26 - Notes from discussion with supervisor regarding the recording of the focus groups

Recording/Completing FG Online

- You have tried out several tools, make sure you discuss this in your thesis.
- You are going to use Google Meet, state why... recording? ✓
- Are there any positives that may influence you to use these conferencing tools for data collection in the future? Certainly → give these ✓
- Add research on this in either the methodology of the study or reflexivity section.
 - James Kite article (2017)
 - Michelle Falter et al (2022)
- Again, this fits nice in your methodological reflexivity section.

Continuing with methodological reflexivity the continuity in application of action research has continued to produce the desired outcomes in terms of the research, requirements of the Prof D and impacts on professional practice (see figure 18). Noticeably within this research study, the

appreciation of action research spanning more than one cycle to continue to develop and enhance practices is more evident, and the idea that in large institutions action research cycles continue is now very apparent. In-line with the literature this would be the 'reflecting and acting again' stage (Dickens & Watkins, 1999). Interestingly, and due to the iterative cycles, the outcomes of study two have supported with the refinement of certain findings from study one, for example, the statistical element of the Digital Development Programme. The findings from this study also unearthed completely new initiatives such as the change to the observation policy at the college. This amplifies the impact action research can have on creating tangible outputs through research that continuously improves how an institution operates. Certainly, and as I reflect and develop as a researcher who advocates for research to be endemic within an institution, the action research cycle is something that as I progress in my career I would want to implement as a strategic priority for all departments to support continuing development and enhancement.

Figure 27 - Notes from discussion with supervisor regarding action research

Action Research (AR)

→ Now starting to see the benefit of AR

• This study has built on the last

• you are now refining findings from study one.

• link this back to the steps of AR → 'reflecting & acting again'.

• this is really good and you have the evidence/outcomes to show from study 1 to study 2.

→ Is AR something that you will use in the future? Does it / will it improve your leadership in the future?

Throughout the second study, there was a need for interpersonal reflexivity. This is concerned with the relationships that exist and how they could influence the research and the people involved (see figure 26). Within this study, I had to be aware that the participants have a relationship with me in the institution where the research was carried out. This was important as it made me reiterate freedom within the focus groups, explicitly informing participants that they were free to give their subjective opinions as if I were an external researcher, thus not holding information

back. This was important, as I needed their true thoughts, feelings and perceptions, not what they believed I wanted to hear due to our relationships as colleagues. I believe this supported the quality of the research in the present study, especially through reiterating confidentiality and the research process. Moreover, it is certainly something that I will continue to pay great detail to in the future, as research in education often relies on relationships of some kind, whether that be peers working together, or various power dynamics, for example teachers and students.

Although I was aware of the power imbalances detailed above that related to interpersonal reflexivity (Olmos-Vega, et al., 2022), going through the process of distancing myself from the research, becoming almost an observer (Mordal-Moen & Green, 2014; van Manen, 1991) has played a huge role in my development as a researcher. As I stated in the reflexive entries in study one, the need to keep better notes throughout each stage of the decision-making process, to aid reflexive thought and become critically-informed again applies here. In terms of the power imbalances here, it was something I debated personally, and discussed with my research team. I asked myself if it was appropriate to use individuals I have a relationship with through being employed at the same institution. The obvious pros to an extent were the ease in which the participants could be identified and subsequently approached to take part in the research. In addition, I knew the participants background so the purposive sampling was made easier. The cons were concerned with power imbalances, would each individual genuinely speak honestly in the focus groups, or would they be influenced by our relationship. More telling, would participants be explicitly aware of the influence. At this point I considered other options, for example, using participants from another institution, but immediately, this was not an option due to the established methodology of action research. Also, in truth, the Prof D was being completed at one institution who were keen to be the beneficiaries of the research. I also considered changing the data collection method, and pondered interviewing participants individually as opposed to in groups, however, I was not convinced that this would have eradicated the power imbalance issue completely anyway.

I continued to consider the issue and became confident that the mitigating steps discussed above were needed, and that due to the nature of action research as a methodology, power imbalances can be a factor. However, the need to involve people as participants in the research is one of the positive aspects of action research, which I much prefer to other methodologies, certainly more quantitative methodologies where participants are referred to as subjects. The need for individuals to be a part of the research is for me one of the key positives of action research so I was happy to proceed. Moreover, and as discussed in the methodology chapter (chapter 3), this study formed part of the observing phase of the action research cycle, meaning the importance of gathering the data from the selected participants was vital in gaining access to their perceptions and views as observers in the process.

I also believe that focus groups were a better option than interviews. For some obvious reasons, it allowed me to gather the views and perceptions of more people, more observers. Through honest reflection, time constraints and the impact of Covid-19 also made focus groups a better option. However, and through reflexive processes I am able to be critically informed, and I would change the approach to the organisation and running of the focus groups in hindsight. I would do this in two ways, firstly, conducting three focus groups as opposed to two. This would have enabled a greater chance for all participants to delve deeper when sharing their thoughts. In addition, I would have conducted the focus groups over a greater time period, to be sure that themes developed and the knowledge gained was truly saturated before completing the process. Although I am confident that the data collected is an accurate and valid portrayal, through reflexivity I believe I have become more critically-aware of the improvements I could have made, constructed from intrapersonal reflexivity and power imbalances, and this links to my methodology, methods and data analysis and interpretation.

Figure 28 - Notes from discussion with supervisor regarding the relationships to the participants

Relationships to Participants

- This will need acknowledging in.
- It is not necessarily negative and you have:
 - developed an FG guide
 - will make reference to confidentiality
 - make explicit the requirement to spread open & honest for the purpose of the research
- It is quite common in AR with the premise to be collaborative & involve stakeholders as researchers. You will need to consider this now & in the future as you develop as a pragmatic researcher who utilises AR.

As with study one, the notes completed throughout the research process have supported every element of my development as a researcher in the field of education. The figures above (16 – 19) are further examples of pertinent conversations with my research supervisor that I reflected on and subsequently improved the quality of the research. Moreover, the use of reflexivity permitted me to continuously review, reflect, consider and re-consider what I was doing and why. These processes have been valuable in developing me as a doctoral level researcher.

**Chapter 6: Research Study 3 –
An interview with Professor
Paul A. Kirschner**

Chapter 6: Research Study 3 – An interview with Professor Paul A.

Kirschner

Chapter Introduction – Professional Context

Research study three continued investigating what effective use of EdTech, digital tools and online learning looks like in an FE environment. This includes the design and implementation of online and blended approaches to learning, the importance and best ways of developing staff, and ensuring that approaches are evidence-informed where possible. In addition, my own needs and priorities as a researcher in a professional environment are prevalent throughout. The findings and outputs from the previous studies are significant, but through the ongoing cyclical action research process, and through reflexivity, my decisions reflect my philosophy as a researcher, subsequently impacting on the research design and implementation. Throughout this Prof D, the outputs of the research have been a key aim, as has my role within the decision-making process, establishing my research at doctoral level.

In order to build on the findings from the previous studies an expert in the field was interviewed to confirm, challenge and offer a wealth of experience and knowledge as part of the research process. The use of this knowledge would then be important in changing the practice at the FE college, the professional setting, where the research has been carried out. The expert was chosen due to their research portfolio in both education, especially cognitive psychology, and technology and online learning. This was crucial, and supported the underlying theoretical framework of the entire thesis, the gap that exists between both technology and education. From my personal perspective, this thesis and my work in the sector for many years has tried to build a seamless bridge so technology can be implemented better in education, something that has proven difficult (Laurillard, 2008; Laurillard & Masterman, 2009). The expert here is someone I have a keen interest in and read much of their work and research, as an expert who has tried to cross the divide between education and technology themselves.

One of the key priorities to achieve through this research was to subsequently review and enhance our approach to digital development that has been implemented following study one. Moreover, the knowledge gained from the expert interview would enable greater explorations of the effective use of online modalities and methods; how online learning is represented in the direct vs constructivist approaches to instruction; the opportunities for online learning in educational institutions; the link between online learning collaboration and the social aspects of education, and how online practices can be developed. The insights into such an expert are few and far between, and this final research study really does give an excellent platform to support the future strategies at the FE college where the research was carried out. Once more it is accepted that some of the findings are not generalizable to a wider audience, however, much of the information drawn out through the interview will be useful in some way for any individual leading teaching and/or online learning in an educational institution.

Abstract

This study builds on the previous research and seeks to triangulate key concepts that underpin effective online teaching, learning and assessment (TLA). Following the two previous studies that collected data from 254 staff in a General Further Education College (GFEC) and completed two focus groups with experts in online delivery, this study would aim to refine clear themes through interviewing renowned expert Paul A. Kirschner. The study was underpinned by the theory-generating expert interview method with a one-to-one interview carried out online, lasting approximately one hour. The typology of expert interview employed was that of the systematising expert interview, as defined by Bogner and Menz (2009). Semi-structured interview questions supported the outcomes of the study by enabling themes from previous research to be explored, but also not restrict new avenues of discussion. The interview was recorded through the online platform used to conduct the interview and transcribed verbatim. Braun and Clarke's (2006) thematic analysis was then used to analyse the data, where the researcher acted as a sculpturer working with a piece of marble, opposed to an archeologist digging in the dirt for buried treasure. The lines of inquiry and

subsequent themes give a great starting point for institutions and teachers to effectively implement online and digital learning effectively as part of their curriculum. A key aspect of this is creating a digital development programme that not only upskills the knowledge and skills of staff in using digital tools, but ensures that teachers have a good knowledge of the principles of how we learn so this can be applied to online learning environments.

Introduction

Following the first two studies in this thesis that primarily focused on the views of online learning as the Covid-19 pandemic was in its infancy, and establishing some key practices of effective online TLA, this study aims to consolidate key findings related to effective online pedagogy. To achieve this aim the research sought to interview an expert in the field, and following initial contact Professor Paul A. Kirschner agreed to take part in the interview to support both the research and the professional doctorate programme. Below is Professor Kirschner's biography as shared privately with the researcher:

'Paul A. Kirschner (1951) is Professor Emeritus at the Open University of the Netherlands, Honorary Doctor (*Doctor Honoris Causa*) at the University of Oulu, Finland, Guest Professor at Thomas More university of applied sciences in Flanders, Belgium, and owns his own educational consultancy company *kirschner-ED*. Prior to his retirement he was Distinguished University Professor and Professor of Educational Psychology at the Open University of the Netherlands and Visiting Professor of Education at the University of Oulu, Finland.

He is an internationally recognised expert in his field. A few notable examples of his expertise are his presidency of the International Society for the Learning Sciences and his status as fellow at that society and research fellow at both the American Educational Research Association and the Netherland Institute for Advanced Studies in the Social Sciences and Humanities. He was also a member of the Scientific Technical Council of the

Foundation for University Computing Facilities (SURF WTR) as well as of the Dutch Educational Council (Onderwijsraad) where he was advisor to the minister of education.

He has published approximately 400 scientific articles as well as hundreds of popular scientific articles and blogs for teachers and school administrators in both English and Dutch. He has also successfully supervised 43 PhDs. He is (co)author of a number of very successful books, including *How Learning Happens: Seminal Works in Educational Psychology and What They Mean in Practice* (#10 in the top 100 Best Education Books of All Time, Book Authority), *Evidence Informed Learning Design Ten Steps to Complex Learning* (now in its third revised edition and translated/published in Korea and China) and two volumes of *Urban Legends about Learning and Education* (also in Dutch, Swedish, and Chinese). He is author of a number of Dutch books including *Op de Schouders van Reuzen* [On the Shoulders of Giants] and *Wijze Lessen* [Wise Lessons]. He also co-edited two other books (*Visualizing Argumentation* and *What we know about CSCL*). He is also chief editor of the *Journal of Computer Assisted Learning* and commissioning editor of *Computers in Human Behavior*.

His areas of expertise include lifelong learning, computer supported collaborative learning, designing electronic and other innovative learning environments, open educational resources, media-use in education, development of teacher extensive (distance) learning materials, use of practicals for the acquisition of cognitive skills and competencies, design and development of electronic learning and working environments, and innovation and the use of information technology educational systems.'

(June, 2021)

With a wealth of knowledge, experience and pioneering research, Professor Kirschner was the number one candidate for the interview, and his involvement enhances the confidence and status of the Prof D study. Not only a leading figure in the design of effective instruction and

research into how we learn, Professor Kirschner is also a leading figure in related research into online learning, making his involvement in this interview a real positive for this research.

The interview is to be based on some of the key findings from the first two studies, and aims to achieve the overarching goal of the thesis for establishing clear frameworks for successfully implementing technology to enhance the design and delivery of the curriculum in FE. Explicit iterative reflections through the action research process embedded throughout the research has permitted critical reflections to guide the next steps in the research, in this case leading to the specific use of the expert in this study. The action research cyclical process has been fundamental to forthcoming research decisions, and a pragmatic research philosophy has underpinned the choice of design and methods to collect data in order to give tangible outputs, as oppose to searching for theoretical truth.

The first study was undertaken during the early stages of Covid-19, where the term 'remote learning' became synonymous in many countries. This was no different in the UK. Following the analysis of survey data completed by 254 staff in a large GFEC, results indicated that the majority were confident in developing their digital delivery in the future (80% of respondents), and only a very small minority (6 respondents – 2.4%) viewed remote and online delivery as ineffective. Finally, results indicated that staff viewed the most difficult aspects of moving to online delivery being not all students having access to a device or WiFi, student engagement, the digital skills and experience of the students, and getting students logged into the virtual learning environment (VLE). Study two then built on these findings to ascertain some key practices that underpinned effective online TLA. Following two focus groups with eleven individuals who had a wealth of knowledge and experience of online delivery three themes were generated. The first theme indicated that online TLA is different from face-to-face delivery, theme two highlighted the importance of technical skills in order to deliver effectively online, and theme three emphasised the requirement of a non-judgemental culture for developing online practice. These findings underpinned the direction of

inquiry for the interview with Professor Kirschner, enabling refinement of salient themes to synthesise underlying practices in the development of effective online pedagogies and approaches.

Results and Discussion

Braun and Clarke's (2006; 2013) TA is different from other approaches, in that it is independent from methodology, epistemology and theory (Campbell, et al., 2021). I value this as a researcher, as one of my underpinning principles for educational research is to improve practice. TA aligns well to my approach to research, and to that of pragmatism and action research.

Throughout the collection of the data in this study, and due to the fact the interview questions were somewhat defined from the previous two studies, the themes were identified at the semantic level, basing the themes on what was said during the interview (Braun & Clarke, 2006). This was engendered for this study to commit to explicit outputs following the interview, and because the interview themes were more defined with clear rationale following the previous two studies. In many respects, the interview was more confirmatory, hence the use of the expert interview method.

The initial phase led to me listening and re-watching the interview several times, taking detailed notes throughout. Following on from this I started to organise the notes, creating labels and data items, in order to create detailed groups of data. At this point the initial mapping of themes through defined properties occurred, for example, I started to see one theme was clearly defined by the effective use of technology methods. I continued with this, refining and re-working codes and themes throughout, until I was happy to define and name a theme. The key here was to ensure the theme had a clear story from the data, and related back to the research questions. At this point, I was very active in the research, owing much to the guidance of Braun and Clarke (2006; 2013), ensuring I had completed the necessary steps to create themes, as ultimately, the researcher defines the themes (Campbell, et al., 2021). Finally, I completed the discussion from the data, addressing the research aims and questions, and going beyond simple descriptions of the themes.

To ensure the reader can navigate important aspects of the interview prior to reading the discussion, extended extracts are included. This was a deliberate decision I made during the research process as a means to give reference to the special knowledge (Bogner & Menz, 2009; Gläser & Laudel, 2004) that shaped the themes created, contextualising the subsequent discussion of each theme. In justifying this action, there is a gap in the literature for how brief or lengthy the reporting of qualitative interview data should be when completing research (Yin, 2011). However, quoted narrative can be effective for shaping discussions and the ‘interchange between two or more people’ (Yin, 2011, p. 236), enabling the reader to follow the story of data and discussion. Moreover, especially as this was such a detailed interview, the use of extracts gives greater detail to the reader in illustrating points and enables them to be immersed in the data and discussion (Lee, 2014; McKay, 2006; Wolcott, 2001). Simply put, much in the way statistical or graphical data is situated in the results section to make it easy for the reader to navigate back to, the interview data here will act in the same way. Navigating between the discussion and appendices is not practical, especially when the extracts enable immersion in the data and discussion.

Below, the reader will benefit from key aspects of the interview, followed immediately by the discussion.

Theme 1: Effective use of online modalities and methods

The first part of the discussion focused on face-to-face delivery in comparison to online delivery, further exploring the findings from the focus groups in the previous study. Below highlights some of the key extracts from Professor Paul Kirschner in verbatim form.

Interviewer: Can we simply take a session that was a really effective face-to-face lesson and deliver it online and expect to get the same results?

Professor Kirschner: Short answer, no.

Interviewer: Why would that be in your expert opinion?

Professor Kirschner: You said that it was really effective in face-to-face. So, I assume that the person making the lesson made use of the tools and techniques in modalities that surely she or he had at his or her disposal in an effective and efficient and enjoyable way. Once one moves from one mode of teaching to another or one modality of teaching to another, one must first evaluate whether or not the tools and techniques that were used in the first modality are also effective and efficient for the new modality, and if you don't do that, if you just transpose the one to the other then you're not making effective use of the modalities that you have. It's just that simple. I mean I can get into things like when you're in a classroom you can see the five, ten, fifteen or even 30 or 600 students in front of you and you can see whether or not they understand what you're saying or what you mean. In an online environment that is often not possible, not the case. You can't in one view see all your students, often they have their cameras off so you don't see them at all. So that just makes a difference in how you react, the interaction between you and your students. I can go on and on about it but all of the different aspects and when you're busy for 40-45 minutes you can keep people in a face-to-face environment fairly engaged in what you are doing. In an online environment 40 or 45 minutes watching or listening to a talking head is just completely different. You might want to change that into two or three 15 or 20-minute sessions instead of one long session. Now you can do it for all the different aspects of a good pedagogically set up lesson. You could look at what you did and what you were trying to achieve in your face-to-face lesson and then analyse it and come to a conclusion of how that could be done in the new online, or I'd more call it making use of other media or modalities to try to achieve what you want to do.

Interviewer: So, the online teaching then, just on that final point, requires a different thought process?

Professor Kirschner: As a teacher you have to think through from what do I want to achieve. What do I want the students to be able to achieve? What do the different modalities that I have allow? How can I best implement them? And you do the same thing as I would conceive of a good teacher

doing in a face-to-face environment and saying I'm with my students in the class in the classroom, how can I best achieve my goals knowing that I'm standing there, and do the same thing for the online environment. I prefer to call it making use of other media and modalities.

Interviewer: Is it fair to say Paul on that, obviously you're thinking about what you want your students to learn etc., but when you are using these different modalities, for example online, that it is very much a different pedagogical approach?

Professor Kirschner: It's hard to say. Your pedagogy might be the same but the way you implement it in the online environment is different. You could say with your pedagogy you want to begin your lesson with referring to the prior knowledge that was necessary. That's your pedagogy. If I'm in the classroom I can ask everyone to try to do something with the equation that we had yesterday, I don't know if we're talking about university-level or high school level or elementary level, it doesn't matter, with that thing they did yesterday and ask them to just hold up a whiteboard and show it to me and I can see in the whole class whether or not the students have done it. Now, I want to use that same pedagogy in the online environment but I can't ask them to hold up the whiteboard because in those little boxes I see on my screen of my 25 students, I won't be able to read what's on that so I might want to use something else. I might want them to use their telephone and make use of some type of quiz or quizlet and do it on that. Now, the pedagogy is basically the same, making use of a retrieval quiz at the beginning of the lesson to see whether or not the relevant prior knowledge is available and if not then to go into it myself and review it for them. I'm just being very simple, very banal about that, but the way I do it is completely different, but I'm using the same pedagogical techniques. So, it's kind of hard, certain pedagogical techniques can either be achieved more easily through different modalities, and some possibly not at all.

Discussion

The initial discussion with Professor Kirschner in many respects confirmed several of the points raised in the focus groups in study two of the thesis. Professor Kirschner discusses how the

modality is vital in the planning and execution of delivery, 'one must first evaluate whether or not the tools and techniques that were used in the first modality are also effective and efficient for the new modality'. He also states the importance of teachers considering what the new modalities allow during delivery. Interestingly, one of the opening points raised in the focus groups by Chrissy was very similar, '...but not just like lifting what we do in a physical classroom and plonking it online, it's about adapting it.' Professor Kirschner also made the notable point that the pedagogy might be the same for a planned in person and online session, but the way you implement this in an online environment is very different.

These points are very clear, and confirmatory of the findings gathered in the previous focus groups. They are crucial in emphasizing the need for institutions to think very carefully about how they utilise aspects of online delivery now and in the future. The surprise and speed in which the Covid-19 pandemic impacted the delivery of education across the world forced educators and institutions to simply deliver some form of education through online modalities, where emergency remote teaching (Hodges, et al., 2020) became prevalent to ensure that education continued. However, as we now move beyond this it is essential that institutions who have now seen the benefits to online delivery, and wish to place it as part of their strategic plans to support delivery, place greater onus on ensuring delivery is skilled and effective and reflects some of the findings here. If educational institutions do wish to incorporate online aspects, with research indicating that there is increased positivity towards technology following Covid-19 (Association for Learning Technology, 2022), the requirement has to be to do this in the most effective way possible, and unquestionably a large aspect of this is the quality of delivery, as it is no longer acceptable to simply replicate face-to-face sessions online. Moreover, staff have to be trained and skilled to fully utilise online modalities, as experience levels impact on the quality of online delivery and the conceptualization of online teaching (Samuel, 2022).

It is very evident that institutions looking to embrace online instruction as a strategic pillar of their delivery models must carry out an in-depth analysis in order to make it successful. The unwarranted criticism of remote learning discussed by Chris Dede, from anyone citing how educators struggled in the pandemic (Shattuck, 2021) is not a true reflection of the benefits online learning can offer. However, it is also imperative that leaders in educational institutions do not unconsciously follow this error of judgement, by perceiving online education as what they have experienced throughout the pandemic, not completing a full strategic analysis, including the development of teaching staff as part of the process. Leaders must be equipped, or ensure that part of their leadership team is equipped with a good level of knowledge regarding online learning, which can be defined in numerous ways (Singh & Thurman, 2019) to its detriment. This will then ensure that strategic plans are made for the use of online delivery, for example, which programmes does it suit and why? Finally, and a major priority, is ensuring that the staff who lead online aspects have the necessary skills and experience to utilise the modality effectively, as discussed here by Professor Kirschner, to deliver the online aspects with an appreciation of both the pedagogy and tools available.

Theme 2: Online learning and direct vs constructivist approaches to instruction

At this point, the interviewer explained to Professor Kirschner that the subsequent questions would be moving to a different theme, linking to concepts Professor Kirschner had discussed in recent papers and podcast interviews regarding evidence-based practice and the science of how we learn in relation to online delivery.

Interviewer: Are there still guiding principles, that are key when teaching or delivering online that must be included for long term learning to occur, for example, assessment, retrieval practice etc.?

Professor Kirschner: Everything. The cognitive architecture of the learning and of the learner hasn't changed because we've changed modalities. So, they have a sensory memory, a working memory

and long-term memory. All of the aspects that relate to that, cognitive load, dual coding, elaboration theory, desirable difficulties, all of those things pertain to learning in whatever modality you're talking about. So that kind of makes it different, I mean it leaves it the same, we process the information and learn in the same way, it just means that if I want to achieve that in my teaching I might have to do other things. If I want my students to take notes by hand and not with a keyboard in a class situation, I can just say close your laptops. This is kind of hard in online environments, so you have to figure out how am I now going to make sure that they process the information while they're hearing it, because I want them to process it. I want them to summarise what I'm saying as opposed to just typing it verbatim what they hear because students nowadays can type as quickly as I can talk. If I require them to take notes with a pen and paper then I'm requiring them also to process the information while they're hearing me speak about it; most students can't write with pen or pencil as fast as they can type requiring paraphrasing, summarizing, etc. I would be hard pressed to do that in an online environment because they have their computers open and I can't tell them to close it otherwise they can't hear my lecture. So, I have to think about how am I going to stimulate information processing when I can't control that part of the information processing process.

The interviewer, following a short overview then progresses to the following related questions.

Interviewer: How does online teaching fit into the debate about direct vs constructivist or discovery learning?

Professor Kirschner: From my experience and also from experience of students and some research projects, the students in online environments as we had this last year and a half with Covid-19, actually need more structure instead of less structure because as a teacher you don't have the intensive personal contact that you normally have with the student where you can see whether or not a student is understanding what's going on. So, while some people have said well now they were online let's make use of this crisis and do more discovery learning they are actually doing the exact opposite of what they should be doing because they should be actually providing the students with

more structure because the student isn't in the classroom. The student isn't going to school. The student has a problem with directing her or his own learning process, with making the time that's necessary to do what she or he has to do. With concentrating on that which is necessary which you can control very, very easily within the contact situation, but which you can't do in the online situation. So even going back to what we did in The Open University of the Netherlands in any event, but also in the British university 30 years ago, the materials were very, very guided. They provided the pedagogy that was necessary for someone who was not in a classroom or in a face-to-face environment knowing that person was studying at all different times of the day and night that you weren't there to see and help them when it was necessary. We chose for very, very structured learning and that's still the case. The less physically available you are the more the necessity of structuring it well to help the students because most of them aren't capable of self-directing and self-regulating their own learning and they've said that. Research here in the Netherlands, students were just dying, I'm talking about high school students but also university students, to be back in the classroom so that there was a teacher there to structure and regulate, help them regulate their learning because they couldn't do it. So it's self-evident.

Interviewer: Is there also a link to where students are on the expertise continuum, about what we might do with them in an online environment (novice vs expert)?

Professor Kirschner: You do the same thing in the online environment as in the face-to-face environment. First of all, most students although they may be a little bit farther along, some of them, if we are talking in the normal way then they might have a little bit more knowledge but they are still very far from being an expert. If they were experts, they probably wouldn't be students. They might be good students, expert students, which means they have learnt how to study properly, so they themselves space their practice, and they themselves interleave, they make use of Cornell notes. Of all of those types of things but it doesn't give them more expertise in the area that you're teaching. Often, they might be one or two lessons ahead of the other students but that really

doesn't make them experts. So that's just number one that's more caveat here in the whole discussion. The second, normally in a face-to-face environment what you'll do is you'll see whether or not you have to begin with the basics. Or you can conceive that they already have it and give a little bit more freedom to learn if you know they already have the prior knowledge, you don't have to go into it in the same way. If you see that they can already solve a problem and go through the proper steps you no longer might have to use worked examples, in that you might want to choose for process worksheets or something, which is also in a normal face-to-face environment. The whole idea of the, the whole world changes once we go over from face-to-face and online and now we need to teach differently and we can go to the difference between the pedagogy and the use of the media. Yes, the use of the media changes but the pedagogy and the principles you use based upon good educational psychological research are still the same basic principles. The cognitive theory of multimedia learning. I use that in the classroom, means that I don't, I don't read my slides and in an online environment that means I shouldn't annotate my lecture. So, they have to listen and at the same time - in closed caption - read what I'm saying because they've also asking them to semantically decode the exact same information in two different modalities which is a strain on their working memory, and which means that they will learn less well because of the redundancy principal. The redundancy principle exists in both my face to face and my online environment, but it means the redundancy can occur in a different way because I don't put closed captioning under what I'm doing in a classroom but I do read my sides which is similar to closed captioning. It might be even worse in an online environment because you close caption it, they hear you and they are also seeing the slides so they are getting it in three different ways, three different parts. You have to be even more aware of the modality principle or the redundancy principle, or spatial contiguity in that way. I mean, if I'm giving a presentation, you have something called temporal contiguity, that's the things are close to each other in time, and the worst thing you can do is present a slide six and by slide 22 refer to that slide because you are 15-minutes further. So, what you need to do is you need to refer to it if you have to repeat that slide as slide 22 and the slide that needs that slide as slide 23

so that it's temporally close to what you are doing. Now you have to do that online or face-to-face, it doesn't make that much of a difference, in principle. It's not a whole new ball game. All of the aspects of what you want to achieve, what you want the students to achieve, the cognitive theories, the models are all the same. The only thing is you're using a different modality to do it and that means you have to understand your modality and how that interacts with the model or the theory that's behind your pedagogy, but that doesn't change the ball game. It doesn't make football into rugby.

Interviewer: How does self-regulation fit into the way we are trying to deliver online, and how can we get it right and wrong?

Professor Kirschner: You can get it wrong by assuming it exists. That's the major mistake and teachers at all levels have this assumption that students can self-regulate their own learning which they usually can't. So, it exists in both situations. The problem with online learning is that you're not there often in real time to help regulate that learning. In the classroom, if they are then busy carrying out a task, you can walk around the room as a professor or teaching assistant or whatever and see what the students are doing, and can help regulate the process. But in the online situation that's almost impossible because you can't see what 15 or 20 students are doing, you can't see what's happening, you only can see that they're busy but not what they're doing. So that means the chance that you might not be able to regulate those students properly is much larger in the online environment than it is in the face-to-face because you're physically there to help with the regulation. But you can't assume that everybody is as bad at self-regulating as the other. You can also see that much better in real time in the face-to-face environment whereas you realise that afterwards in the online environment when you see that the person hasn't been able to get the thing (work) done on time or handed in on time or choose the proper approach or whatever. So, it's much more important in the online environment to assume until proven otherwise that students can't self-regulate and try to teach them how to do it because self-regulation is not something that comes easily or comes

magically. While students are often very much capable of self-regulating all that they have to do in order to go to a party on Saturday night, when put in a learning situation they aren't that good in that and also in portioning their time. Let's say you go over to an online environment, and as I said you shouldn't spend 45 minutes lecturing or something, you might choose 15-minutes of lecturing and then 30-minutes of, ok working on their own and we'll see tomorrow what happened. But then you're assuming that those students are capable of at that point in time stopping with your lecture or whatever it is you're doing and will then begin on the work that you expected them to do. Which you've set up in a certain way because you've chosen for certain pedagogy and they do it the next morning 15 minutes before the next lecture starts, for example. So, you don't have that control over the situation in which you can help them regulate their learning, and at a certain point in time give them more freedom. In the online environment it's just harder to do that, not impossible, just harder.

Discussion

Professor Kirschner commences this aspect of the interview by affirming the view that people learn the same or process information in the same way online as in face-to-face environments. In this sense, he is referring to 'cognitive architecture', as he refers to individuals having sensory memory, working memory and long-term memory. This is a key aspect in understanding effective use of online methods to support learning. In the first part of the discussion (theme one) Professor Kirschner confirmed the views of the focus group (study two) in that teachers and instructors must adapt delivery to suit that of the modality they are using. However, and it is important not to conflate these points, but Professor Kirschner confirms that the information processing mechanisms are actually the same in the different modalities. This point is absolutely critical and must be understood by teachers and leaders within institutions looking to make better use of online practices. This leads to effective instruction utilizing the correct approach and tools in an online environment, to ensure that students are given the greatest opportunity to process

information. For example, if we are not aware of the role of working memory (Baddeley & Hitch, 1974) within our cognitive architecture and information processing system, we can actually inhibit the chances students have of processing information by overloading working memory (Sweller, 1988; Sweller, et al., 2011). This highlights the importance of understanding the basics of cognitive science applied to how we learn, irrespective of the modality being online or face-to-face. Secondly, it also emphasises the importance of technical skills to be effective in online environments, supporting findings from the focus group in study two. Quite simply, if we take retrieval practice as an example, as it has regularly been shown to be vital for learning (Dunlosky, et al., 2013) and prominent in highly effective teaching (Rosenshine, 2012), then teachers must have the necessary technical skills to be able to implement this online. Now, there are many different programmes and methods for doing this depending on your institution's operating system, but the technical skills are crucial in enabling the pedagogy, and if aspects of online delivery are to be planned by institutions, then having the required technical skills to enable the pedagogy is fundamental as we progress out of the pandemic to a point where online learning is being used as a choice to benefit learning and the student experience.

Closely linked to the above, and not surprising following his seminal paper *Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching* (Kirschner, et al., 2006), Professor Kirschner was clear that online delivery is not simply a place for discovery learning or minimal instruction, especially when dealing with novices. In fact, Professor Kirschner intimates that giving the proper guidance online is in some ways more difficult than in face-to-face environments. Research pioneered by Richard Mayer (Mayer, 2001; Mayer & Moreno, 2003) has supported the effective implementation of multimedia techniques, and these are important for use in online domains. Moreover, these principles are essential for use in both synchronous and asynchronous learning, which is another significant aspect for consideration by teachers and institutions. Getting this balance right is essential for success in any modality, and clearly this is the case when online

aspects are utilised. It is not to say that the collaborative elements that can be afforded through online modalities should be abandoned or discouraged, but they require great consideration to be effective, as does the consideration of the research base available for effective online delivery. For example, how often are presentations loaded with information that is not relevant (Coherence Principle) (Mayer, 2009, p. 89), or asynchronous support videos are great in length and try to cover a range of topics (Segmenting Principle) (Mayer, 2009, p. 175)? Both of these would be detrimental in the utilisation of online modalities and methods, so the training of staff technically, but also on the key underlying principles of effective instruction is a key component for any institution serious about expanding their use of online methods. In many respects, although the media changes, the pedagogy and the principles are the same, as Professor Kirschner commented:

‘It's not a whole new ball game. All of the aspects of what you want to achieve, what you want the students to achieve, the cognitive theories, the models are all the same. The only thing is you're using a different modality to do it and that means you have to understand your modality and how that interacts with the model or the theory that's behind your pedagogy, but that doesn't change the ball game. It doesn't make football into rugby.’

The final point of interest in this theme was how Professor Kirschner intimated the importance of self-regulation, and how this should not be taken for granted in an online environment. Furthermore, he acknowledged that regulating learning in online environments is ‘harder to do that, not impossible, just harder.’ Clearly, the ability of students to regulate their learning is important to success (Foerst, et al., 2017; Kruger & Dunning, 1999; Zimmerman, 1990; Zimmerman & Schunk, 2001), and this has to be considered and planned for in online environments. As mentioned previously, the technical development of staff wishing to use online methods is imperative here, as not only do they need to understand the basic research and premise of self-regulation, as they would in face-to-face delivery, they also require the skills to then accomplish this when utilizing online approaches in their delivery. For example, a teacher may need to set up an

additional chat function, or break out space to offer students the opportunities to discuss elements they are not comfortable with. Additionally, they may need to use tools that make the collection of assessment data relevant, timely and ongoing to support students to reflect on actual progress in comparison with perceived progress, as students making accurate judgements of learning is vital (Hacker, et al., 2000; Kruger & Dunning, 1999).

Theme 3: Online opportunities for educational institutions

The interviewer then informs Professor Kirschner that the next few questions are based around the potential opportunities that aspects of online learning could offer institutions.

Interviewer: Should we be thinking about utilising online delivery in a different way?

Paul Kirschner: If I'm working in a kitchen and depending on what I want to do, I can use a vegetable knife or a knife to fillet or to debone something and of course I can use each knife for the other purpose but that's not very good. It's the idea of what do I want to achieve and that's always the guiding principle. It might be the case although I haven't studied, it might be the case that certain, the freedom of online teaching and learning allows you to supplement what you're doing in a meaningful way. The availability of online open educational resources and things like that. You might, the teacher might, tend to use that more in the online environment than she or he does in the normal face-to-face environment because they're dealing with a book and you're making use of the book, and you might go online if you're teaching physics to find a good simulation of lenses concave, convex, the combination of those and things like that, but in an online environment you might more easily choose to not give that lecture about concave and convex lenses and make use of something that was made in the open courseware initiative for MIT. Where I assume the professor in physics at MIT is better than most physics professors at whatever college you can think of. You can then assign that and then make use of that, in you could say a flipped way in your own classroom. When you're with the students online to discuss it, you might more easily choose to do that is what I'm saying; because you can just as easily do it in your normal face-to-face and assign

them the tasks of looking at this video of a professor. Or finding for themselves a good video explaining convex and concave lenses and then in the classroom work on a number of tasks with them alone on that. The chance is possibly greater if you did that in your normal environment that it might not work (face-to-face). You might be more prone to do it online because you think we're already online then I won't give that lecture I will devote my time to something else. Whereas in the face-to-face you might begin with explaining concave and convex and I'll put up a demonstration and show it and have everybody gather around me. So, it has its nice things as you interact in a different way with them. Everything has its positive and negative sides to it but you might be more apt in the online environment to do those types of things but it's not necessary. It doesn't necessarily lead to better teaching or you could possibly say, maybe in your face-to-face environment you should make more use of open educational resources, open courseware than you normally do. You're a teacher and part of your job is information transmission but a library can also transmit information. Maybe your job should be to, more to work with the students with that which has been transmitted. But it is also dependent on what level, if you're talking about a first-year university student you wouldn't do that. With a fourth-year senior you would be more prone to doing that, and that's why even at the Dutch Open University we had a different model for first level than second level than third level. You've got the first level called learning units where everything was built in, including the information. At the second level we called it textbook-workbook, in which we choose a textbook instead of writing our own good didactic material, pedagogical material, and gave them a workbook which would take the place of the teacher. The third level we called workbook-source materials in which the basis was no longer in the textbook with the information but the workbook and they themselves had to find the proper source materials to do the things that were in the workbook. So, we changed it around. So, you could say at the first level it was completely directed externally and we made use of a transmission model with all of the structure built into it. The second we made use of specific learning materials, the textbook, but we incorporated the pedagogy into something else as we assumed they could integrate the two with

each other after having done the first level courses, and the third one we said we are not even going to give you the source materials, the textbook, you have to find them yourself because you are far enough. You should be good enough to deal with this task in the workbook, to find the proper source materials to be able to carry out the task or solve a problem or whatever because you have the basic knowledge and you know how to carry out tasks. Now we're not going to spoon feed to you in anyway at all, find it yourself. Now, it's the same thing if we are talking about what was face-to-face and now possibly increasingly online, is that depending on your student population you choose the proper level of structure, amount of structure and for your teaching. And it doesn't mean at the third level we're leaving it to them to just self-direct their own learning, no, we're giving them the tasks that we know, going back to *The Ten Steps* (van Merriënboer & Kirschner, 2018), the tasks that we know will show whether or not they can carry out or whether they've learnt what they should learn. So, we still give them the tasks, and we do that in the task classes in *The Ten Steps*. The only thing is that as the students become more advanced, we remove a certain amount of the scaffolding, and some of the scaffolding here is giving them the information materials instead of having them find it themselves. But we still give them the tasks they have to carry out and the criteria that we'll be using to see whether or not they have carried out the task correctly.

Interviewer: Can the use of online approaches offer opportunities to develop long-term knowledge through deliberate practice?

Paul Kirschner: People really don't understand what deliberate practice is. Deliberate, it sounds so simple, you practise with a reason, deliberately you do it. People think that you can create the deliberate practice but this is something that comes from the person her or himself. If you go to your football training and you deliberately, in the familiar sense of the word, the non-specific sense of the word, deliberately practice your free kicks, so now we go over to this part and they put up that row of defenders in front, or maybe they are real defenders and you practice, and you say I'm doing expressly, so I'm doing it deliberately. That's not deliberate practice. Deliberate practice is when the

football training is finished, you then take out that row of defenders, and after the coach has gone and whatever. Or while the coaches or trainers do something else, you spend an extra 15 to 30 minutes everyday practising those free kicks, because you want to become an expert in it. You want to be able to 'bend it like Beckham'. That's deliberate practice. Deliberate practice is something that the pianist hasn't been told to practice but does it her or himself, and if you look at that in terms of goal orientation theory, you would say deliberate practice is primarily carried out by those students that are mastery oriented or mastery approach oriented. They are doing something because they want to be good in it, and so they walk that extra mile to become good in it. Do things above and beyond, choose the more difficult task to challenge her or himself. Whereas most students in most subjects in my opinion, I haven't studied that, are more achievement orientated. Their goal is to get a good mark, and that's it. Now if your goal is only to get a good mark, you'll do that which is necessary. You'll practice, you'll study as much as you think you need to get that mark or grade you want to get. Whereas a student with a mastery approach and especially when we're talking about not an avoidance but an approach; so, as a mastery goal orientation approach, mastery approach as opposed to mastery avoidance, they will be that person who makes use of deliberate practice. But in Barak's (Barak Rosenshine) terminology, it's not deliberate practice, it's just in the first (instance) it's very guided because you need things like worked out examples and partially worked out examples. That's the guidance, and at a certain point in time you have to be let free just to do it without that. Whereas the teacher is still standing there and seeing where the students are having problems, but you're giving them practise assuming or knowing, because another thing is to try to achieve mastery, another is constantly asking questions. So, you've done all of that and you have this idea that a student is capable of carrying out the task un-guided by you, and then you let them do it there and let them show that they can and try it for themselves. But you're there watching to see whether or not they end up going in completely the wrong direction.

The interviewer asks a further question related to practice.

Interviewer: Do developed approaches and ability to use online aspects allow that aspect, that principle of allowing the student to practice independently?

Paul Kirschner: Yes, it does but it doesn't very easily allow you to look over their shoulders. In *The Ten Steps* which you've read we have the assistant looking over your shoulder - Aloys, and in a face-to-face situation you have that. You know if they are making use of a simulation what their screen should look like if they're doing it well, and you let them do it alone, but you walk around the class and you all of a sudden see that Steve's screen is somewhere it shouldn't be, and at that point in time you can intervene. In an online situation that's really hard as with 25 students. I don't know how I can look at 25 screens at the same time on my monitor. There you need an intelligent system and a dashboard that will let me know that 18 of the 22 are doing it OK and only badly 3 or 4, but then you're asking the system to monitor what the student is doing – a 'privacy' problem – and also be able to interpret the way the screen looks and give you a clue that 'Hey, I think you need to go to Steve because he's now in the yellow zone and the needle might be going towards the red'. But the other 18 you don't need to do anything because it's going well and I can see that when I'm walking around the classroom and I just look around and I can see what they are doing on paper, on their screens or whatever. I can see that and can see who those four students (who are struggling) are but in online environment I can't do that. It's the same with online collaborative learning. If you have five groups of students sitting in different places in the classroom, I can immediately see which group needs my help and which one doesn't. In an online environment I don't know how I would monitor the chats of five different groups to see whether or not there was an emotional disturbance in it, where all of a sudden the students weren't working effectively with each other. That's why we're trying to build dashboards for collaborative learning situations which will give us the information. If I look at it and I say OK that's going well and I see the needle pointing to the yellow going towards the red in that group because my system can analyse their chats, or they're talking or whatever, then I know that I have to go there. I don't know how I would do that in five or six collaborative learning teams in an online environment. I would have to constantly jump from one to

the other and try to see what's going on, and they are also online with each other and communicating with each other in a different way than if they were in face-to-face, and that makes it really, really hard.

Discussion

The initial discussion in this line of questioning makes it very clear that a key premise is to think in detail and consider the options available to you, related to what you want to achieve through delivery to support students to learn. Of course, like other tools, techniques and methods, utilising online modalities can support learning, but the entire process has to be considered in great detail. Professor Kirschner stated the following during the interview, 'It's the idea of what do I want to achieve and that's always the guiding principle.' Interestingly, this is somewhat a recurring theme throughout both this interview and the focus group in study two. It is evident that simply replicating online, delivery planned for face-to-face instruction is somewhat pointless and certainly not an effective use of online tools and modalities. Clearly, during the pandemic this was very much the approach as offering some form of education was needed, but if institutions are strategically emphasising the use of online learning post-pandemic there is a great responsibility to move beyond this, to a research-informed, considered approach to online resources that skilled staff can implement and use effectively to enhance delivery.

During this conversation Professor Kirschner discussed the potential of the flipped approach to delivery. This approach, although there are now many iterations and versions, is based on the premise of giving the theoretical content in advance in order for class time to be used for higher order learning and theoretical application (O'Flaherty & Phillips, 2015). The use of online tools and modalities would certainly appear to support this instructional approach (Bishop, 2013), but as with every technique and method, great thought is required. As a relatively new instructional technique, the research database is building, with some research supporting slight gains (Låg & Grøm Sæle, 2019; van Alten, et al., 2019) to other research offering strong claims for its use (Nouri, 2016).

However, this approach may be of use to many institutions and individual teachers as an effective instructional approach to make benefit of online modalities and tools. It certainly moves beyond the face-to-face replication model adopted during the pandemic (Hodges, et al., 2020), and would encourage deep thought and careful consideration as to how and why it should be used as an approach, with the design of the approach crucial (van Alten, et al., 2019). A caveat once again is the need and requirement of staff, both teachers and leaders to have the necessary skills and aptitude to be able to design and implement the approach, as it is far more than setting work to be completed away from the teacher and classroom, especially where online tools are to be utilised. For example, if media is to be developed, the research and evidence base must be adhered to in order to reap the rewards and support learning, as opposed to having potential detrimental effects (Mayer, 2009; Sweller, et al., 2011). This all must be considered in detail when designing flipped approaches using online modalities.

When considering how online and digital tools and technology can support learning based on giving students greater opportunities to engage in meaningful practice, it is fair to offer optimism. During this part of the discussion, Professor Kirschner did differentiate between the concepts of deliberate practice (Ericsson, et al., 1993) and practice that forms part of the evidence on effective instruction (Rosenshine, 2012). Professor Kirschner stated 'Deliberate practice is something that the pianist hasn't been told to practice but does it her or himself, and if you look at that in terms of goal orientation theory, you would say deliberate practice is primarily carried out by those students that are mastery oriented or mastery approach oriented.' This is opposed to practice grounded in effective instruction, which starts more guided and becomes more independent as the student develops overtime. Both of these concepts differ, but involve the requirement for students to have access to materials to support aspects of practice, and potentially to be able to repeat this practice over and over. When considering previous points related to the simple replicating of face-to-face teaching in an online environment, and the associated issues with this, there is great potential for online and digital tools to support learning with the requirement to support repeated practice. Video

and media would be an obvious method for achieving this, enabling students to revisit materials as many times as they needed in order for them to grasp concepts or address any misconceptions, and as previously stated, creating the media in correspondence with the research will only enhance this (Mayer, 2009). Additionally, more advanced technologies could also offer a great potential in supporting students to practice. Virtual reality (VR) for example, has shown promise in educational fields (Erolin, et al., 2019; Yammine & Violato, 2015; Zhao, et al., 2020) and although further research is required to build on the obvious notion of greater student engagement and constructivist learning (Ferriter, 2016; Hu-Au & Lee, 2017), technically there are opportunities to build content with high fidelity learning experiences to support students to practice and become fluent in a given domain. For example, students studying catering could practice more often in restaurant kitchens, making dishes virtually, ensuring that they use the correct amounts of ingredients and practicing specific techniques, such as filleting fish. Within the VR experiences decision trees can be made to ensure that regular feedback is given to support the students to develop their knowledge and skills. Although further research is required, the use of VR does offer opportunities, certainly addressing the replication approach and moves beyond emergency remote teaching (Hodges, et al., 2020), and supports underlying requirements to learn effectively. There will be challenges, as Professor Kirschner mentioned briefly goal orientation theory underpins mastery learning, and the use of VR will not necessarily change students to mastery approaches. Likewise, and as highlighted during the pandemic, access to technology is clearly vital for participation (Killen & Langer-Crame, 2021(a)), but the use of VR does offer opportunities to develop learning, especially asynchronously and it should be considered in the future planning and use of online and digital approaches by institutions.

Theme 4: Online learning, collaboration and social aspects of education

The interviewer then refers to two pieces of research by Professor Kirschner on the subject of collaborative learning in online environments prior to asking the next set of questions.

Interviewer: How important is collaboration, and does more attention need to be paid to the social aspects during online delivery?

Paul Kirschner: It needs to be done in all situations, it's just that simple. I mean the last piece of research that I did with Jimmy Zambrano, John Sweller and my daughter Femke Kirschner, that was in a face-to-face situation and we found that familiarity was very important and also having worked with each other on an analogous problem. So that they know each other not only socially but each other's work habits, and when you have to help or intervene, is this a person who works hard, whatever, those types of things. We found even in the face-to-face environment it's really important, and we've known that for years because we don't put a group of firefighters together and say ok you're a functioning firefighting team. We first put them in a number of simulated environments in which they can work with each other and see how and when they have to cover each other's back, and how, what the little idiosyncrasies of the different people are. They have to socially interact with each other, so it's the same if I'm talking about collaborative learning in a face-to-face as in online environment. In both of them you need to have the team, the idea from Tuckman and Jenson from going through different stages of forming, storming, norming, performing and then adjourning. That's the same in both of the environments, it doesn't change and those aspects have a very important social aspect because the norming is completely social.

Following some dialogue between the interviewer and Professor Kirschner, he added:

The problem with collaborative learning, computer supported or not, well there are a lot of problems but the two major problems that I'd name are assuming a group can work as a team; and two, most teachers aren't capable, or don't think about, or both; the necessity of creating a task that's complex enough to require working in a team. Where the transaction costs of collaboration, of communicating and coordinating behaviours with each other, is not higher than the benefits of working together. If the costs exceed the benefits people will not work together with each other, it's that simple. You know it yourself. If you think it's going to cost me more time and more work to do

this with someone else then I'd prefer to do it alone and you only want to work with others when working with others makes the load less, makes the end product better, those types of things. Most teachers don't think about that. They give a task that they'd normally give to an individual student and they give them to a team, but if it was already fit for an individual student then it's definitely not the complexity that you need for the team. It's just that simple, otherwise you would never have given it to the individual student because it would have been too frustrating and they would have never been able to carry out the tasks. So, you have to re-think the tasks you are giving if you're working in a collaborative setting, independent of whether it's online or not, that doesn't matter.

To conclude the discussions on this theme, the following key points were raised in one long piece of dialogue:

Certain environments are more conducive to that social aspect...

Paul Kirschner: Those are the things (social discourse) you do in a normal classroom but you don't find that at the beginning of most online lessons. Which means although you can do it, that means as a teacher or as an instructor you have to build that into the schedule to have that happen, and you have to do that explicitly whereas it happens implicitly in a normal face-to-face environment, and that's really important if you want people to work with each other.

...that social aspect is really important and you can't take it for granted that in the online environment it will develop in the same way as it does in the face-to-face environment.

Discussion

In this aspect of the discussion, it became apparent that the social aspects of education are clearly important in all forms of teaching and instruction, including where there is a reliance on online forms of delivery. Professor Kirschner stated '...that social aspect is really important and you can't take it for granted that in the online environment it will develop in the same way as it does in the face-to-face environment.' Evidence also supports this in both HE and FE institutions as shown in

the recent Jisc digital experience insights surveys (Killen & Langer-Crame, 2021(a); Killen & Langer-Crame, 2021(b)). Moreover, research shows that the wider elements of study programmes and courses should be considered, such as field trips and placements, and how this affects the students' learning experience (Neves & Hewitt, 2021). Clearly, institutions and teachers need to consider this aspect when designing, or utilising aspects of online delivery. For example, communities of practice as defined by Wenger et al (2002, p. 4) could be adapted to online spaces, and support educational purposes; "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis". Moreover, these communities are important for students to engage in the social aspects that occur more naturally in face-to-face education, and offer opportunities for greater collaboration and reduced isolation (Patton & Parker, 2017). Crucially, the need for the social aspect of education, the feeling of belonging and community is something that can be supported well through online methods, with a variety of tools capable of embedding this naturally into learning design. However, and underpinning this capacity is the need for teachers and leaders within institutions to prioritise this aspect of learning design, and have the technical skills to implement this effectively. Institutions must plan astutely when and where online and blended modes of delivery are to be used, as there is evidence to suggest that only a small percentage of students prefer learning mostly online (Neves & Hewitt, 2021). However, in the instances where online and digital learning is implemented, strategies must be put in place to support that feeling of belonging (Peacock & Cowan, 2019) and create a positive learning culture for students learning online.

The second important aspect of this part of the discussion progressed from the social aspect of being in education, to the use of collaboration as an instructional tool. Professor Kirschner stated the following;

'...the two major problems that I'd name are assuming a group can work as a team; and two, most teachers aren't capable, or don't think about, or both; the necessity of creating a task

that's complex enough to require working in a team. Where the cost of collaboration, of communicating and coordinating behaviours with each other is not higher than the benefits of working together. If the costs exceed the benefits people will not work together with each other, it's that simple.'

The issues raised here are not exclusive to online learning, and although there are positives to be gained from cooperative/collaborative learning (Slavin, 1995; Webb, 2008) there are principles that are important for success, such as group goals and individual accountability (Slavin, 2014). Additionally, the principles of cognitive load theory should be understood and applied for success with collaborative learning in computer supported and/or face-to-face instruction (Kirschner, et al., 2018). This once again leads to the need for careful planning and deep consideration of how group work or collaboration are utilised in online environments. Indeed, computer-supported collaborative learning (CSCL) (Pietarinen, et al., 2021), as with all planned learning and instruction will have limited success where students are not given adequate guidance (Kirschner, et al., 2006; Vauras, et al., 2019) in accordance with their current level of knowledge and/or skill levels, and for any teacher looking at utilising any form of collaboration as a tool for effective learning online, it is imperative that they consider the cognitive properties of their students, the cognitive challenge of the task, and the composition of the group (Kirschner, et al., 2018). In many respects, the planning of effective collaboration in any learning environment entails greater thought than individual instructional tasks, as the collective working memory or 'mutual cognitive interdependence principle' (Kirschner, et al., 2011) is present and must be considered in order for effective collaboration that supports learning.

These principles are imperative for any form of collaboration to be successful in an online environment. As discussed previously, the replication approach to teaching online at the onset of the pandemic is now not appropriate for quality online provision in institutions. Where collaboration is planned for as part of the learning process, this must be completed on the basis of sound instructional approaches (van Merriënboer & Kirschner, 2018) and move beyond the notion of

simply using online collaboration for discovery learning, as this may not be the best approach dependent on the students' current knowledge, skills and collaborative cognitive load.

Theme 5: Developing online practices

The final question progressed to the development of teachers' online practices.

Interviewer: Do you have any views on how best we can develop the skills of teachers, so they are confident of using technology when and if needed, to support and enhance the programmes they offer?

Paul Kirschner: Yeah, that's really, really hard because they'd have to know both. At a conceptual level and at the skills level what different technologies can do, and I'm not talking about physically making an animation or something you can let someone else do that; just designing what type of animation or whatever, you have to have a deep conceptual knowledge and understanding of the tools of the trade, and you hope – although it's not always the case – that in the face-to-face setting at the teacher training colleges that they've gone to, they've gotten that training in the basic pedagogy, which often isn't case. I mean our studies of textbooks and syllabi used at teacher training colleges in the Netherlands and Flanders (Belgium) shows us that spaced practice and retrieval practice is not a part of most curricula for teachers at teacher training colleges. While learning pyramids and learning styles are. So, if we take the optimal situation, and that's the teachers are really three-star top-chef teachers in their normal way of doing it, then in any event understand the different cognitive psychological models, theories, with how you achieve good instruction. Then the only thing you need to do is acquaint them with how that can be achieved, that which they normally do well in a non-face-to-face environment. So, if I was going to give a course in it for teachers, the first thing I would do is acquaint them with Dick (Richard) Clark's work on it's the message, the pedagogy not the medium. The (Richard) Clark (Robert) Kozma debate. I'd acquaint them with the first, the second and now the third handbook of multimedia learning from Rich Mayer; it's coming out soon. In the first one he had five mistakes, in the second one ten, and now the newest one

fifteen, with Dave Feldon and someone else. I'd acquaint them with that. With kind of like the fallacies relating to making use of media. Then I'd follow that up with what media can achieve but based upon their already good teaching practices. So, if their normal way is to start every lesson with a short retrieval practice session; as Barak Rosenshine would say step one. If they normally do that, then I would concentrate on a community of practice or group CPD or whatever you want to call it, a teacher learning group. I would then acquaint them with, ok, what are the different tools that you have to do it. So, you're leaving them in their comfort zone, this is what I normally do and do well but I don't know how I should do that in my online environment. So, they don't have the feeling, I have to do it completely differently; no, you have to do the same thing but possibly with a different tool. This is how you do it with the tool. These are the five or six different quiz programmes you can use and with this one you can get open answers, and in this one you can use that, and in another one you can do this. Oh, and have you ever thought about sending them a WhatsApp 15 minutes before the lesson begins, requiring them to fill that in otherwise they can't access the online environment, so that you know they have done it. Then you can see immediately what you've done. These are the different tools that you have to implement the techniques that you already use. So always talk about tools, but also pedagogical techniques.

Following a brief conversation between the interviewer and Professor Kirschner, the latter finished the interview with the following:

Paul Kirschner: It's kind of like a more stage rocket. The first is, what's the content, what do you need them to learn and what do you want them to learn? The second is, and what is the pedagogy that I used to do it, and the third is which tools do I use seeing the situation, to achieve that pedagogy? I don't know if could always assume that stage one and stage two have already fired and just go into stage three.

Discussion

Within this part of the interview, Professor Kirschner emphasised the importance of teachers having a sound base level of knowledge and appreciation of what constitutes good instruction, including the principles of how we learn. This is important for all forms of education, not just online provision. Professor Kirschner's own research has indicated the need for evidenced-informed content to be included in teacher education textbooks (Surma, et al., 2018), and a plethora of other research has indicated that teachers and educators may not utilise the best strategies for instruction (Deans for Impact, 2020; Willingham, 2019) and may even implement strategies based on myths (Dekker, et al., 2012). This is a great starting point for all institutions, irrespective of how they plan to implement online practices. A strong CPD programme that supports and develops effective instruction (van Merriënboer & Kirschner, 2018) and ensures that teachers have a good knowledge of how we learn from a cognitive perspective specifically is key, and will support all teachers, irrespective of their delivery modality.

This knowledge can then be built on and applied to the necessary online modality, with the requirement to utilise the research into effective use of multimedia learning methods (Mayer, 2009). This will help to reduce the fallacies related to online learning and the use of digital tools that can support effective instruction. Professor Kirschner emphasised the need to focus on the key principles and the pedagogy of good instruction when he commented, 'So they don't have the feeling, I have to do it completely differently; no, you have to do the same thing but possibly with a different tool.'

The need for institutions to prioritise the development of teachers' online practices is of paramount importance if the use of online and digital tools is part of their strategy for curriculum planning. Although the education sector did really well during the pandemic to continue to offer some forms of learning, as we move beyond the pandemic the use of online practices must also develop. This is echoed by Laurillard & Masterman (2009) who state that the development of skills, confidence and the use of technology is vital in order for online delivery to move beyond simply replicating current practice in an online medium. Moreover, quality training and development is

required to ensure that computer self-efficacy (Compeau & Higgins, 1995) and perceived skill levels do not hinder the implementation of online and digital tools, as research suggests this is the case (Shea, 2007; Tabata & Johnsrud, 2008; Zhen, et al., 2008).

In many respects, the starting point for institutions who are wanting to improve their use of online learning and digital tools should be based on equipping their teaching workforce with a good knowledge of the underpinning principles of how we learn; the underpinning research into effective use of multimedia learning; and a training programme that enables teachers to then apply this through a range of digital tools. For example, knowing that distributed practice and retrieval practice are established as essential for learning (Carpenter, et al., 2012; Dunlosky, et al., 2013; Karpicke, 2017) and should be incorporated into learning design is the starting point. Developing the skills and aptitudes of teachers to then implement this through digital tools naturally follows and is a key requirement. In this way, the blend of effective instruction and the use of digital tools are interwoven successfully.

In order to achieve the above, it is clear that institutions must recognise the key principles that underpin effective staff and teacher development. For example, the appreciation that culture will develop overtime (Darling-Hammond, et al., 2017), and be supported by the development of trust to engender meaningful development (Schneider, 2003; Villeneuve-Smith, et al., 2009) and the learning of new habits (William, 2016). Institutions must look to invest in the development of digital aptitudes overtime, and link this to the strategic direction of their institution. Institutions should look to create digital development programmes to support the needs of all their staff. These programmes could be developed to support synchronous and asynchronous learning, and be a great way of modelling aspects of best practice when designing and implementing these with staff.

Conclusion

Building on previous research carried out in this thesis, this study aimed to triangulate key concepts that underpin effective online TLA, to support institutions and teachers to implement

online and digital learning effectively. The study was underpinned by the theory-generating expert interview method, carried out through semi-structured interview questions. Renowned and leading expert in the field of instruction Professor Paul A. Kirschner was interviewed online. The interview lasted approximately an hour and was recorded. During the interview and subsequent analysis, five important themes became evident following the process of sculpting through TA (Braun & Clarke, 2006). Within the first theme Professor Kirschner confirmed many of the points raised in the focus groups carried out in the previous study (study 2 of the thesis), discussing the importance of recognising what differing modalities offer, and if they are effective for delivery. In this case, simply replicating a face-to-face session online is unlikely to be effective in the majority of sessions. Within theme two Professor Kirschner confirms that the way individuals process information, their 'cognitive architecture', is the same in online environments as it is in face-to-face sessions. This is a salient point and must not be conflated with the first theme. What is key here is the need to understand the tools and what can be achieved through using them, which is vital when planning online aspects within delivery, as this will support students to process information in the most effective way. Within the third theme, approaches such as flipped learning were discussed and how online tools and approaches could give opportunities for students to practice more in simulated environments, for example, through VR. Theme four was based around the social aspects in learning, with two main aspects underpinning this. Firstly, the social aspects built through friendship and peer groups found in education, and secondly, the requirement for great thought to be given for the use of group, team and or collaboration within online environments. The final theme considered developing online practices, with the requirement for a good knowledge of instruction and learning principles a prerequisite to then developing the skills and knowledge of digital tools and modalities, in order to enable effective implementation of such principles and science.

The five lines of inquiry and subsequent themes give great indication and guidance for institutions and teachers who wish to continue to use online learning and tools as part of their curriculum design and delivery post Covid-19. These clear principles should permit clear strategies to

be formulated to ensure effective use. Institutions should have a clear CPD plan that not only focuses on technology, but incorporates key principles of how we learn before progressing on to how this applies in online environments. Institutions should devise a digital development programme that gives staff the confidence and skill level to deliver effective learning online, that is based on the principles of how we learn and how we process information. The rich evidence base available specifically for multimedia learning principles (Mayer, 2001; Mayer, 2009) should be incorporated into these developmental programmes.

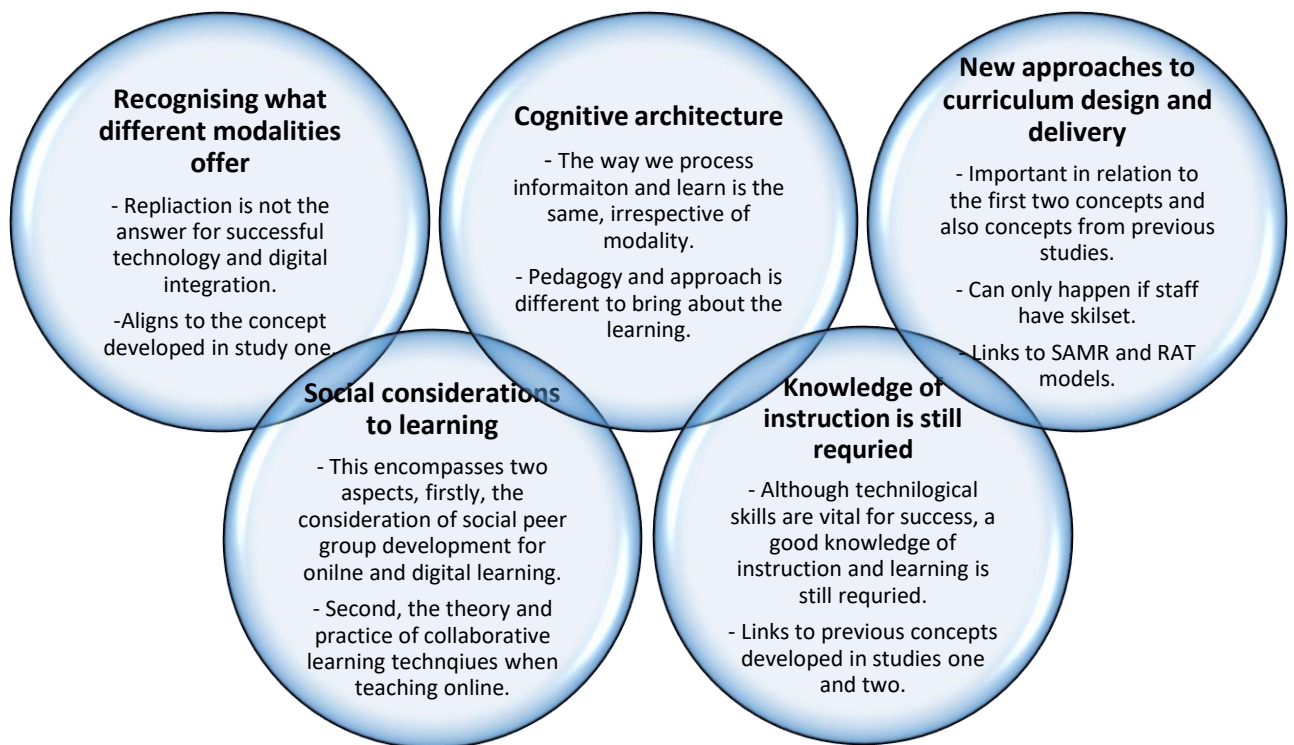
Conceptual Mapping

As with the previous two studies concept mapping was embedded to enable me the clarity of thought following the analysis and interpretation of data. Concept mapping from studies one and two were vital in shaping this current study, and as stated previously, the thematic analysis in this study was at the semantic level, with the themes of enquiry defined from the concepts developed in the previous two studies. Reflecting on this, my thought process was to continue to ensure the progression of knowledge and subsequent action following all three of the primary studies, and concept mapping supported with this. It was an explicit choice I made which also linked to the phases of action research, with this study aligned to the reflecting stage. This was important for this research, but also my development as a researcher, as I developed my awareness of the phases of action research, the alignment to the concepts for each study, and the actions developed in practice as a result of this. This was another key advancement in my development as a researcher throughout this Prof D.

As with the previous study, the concepts included are based on those developed through thematic analysis (process detailed above), but with a greater focus on the reflecting phase of the action research cycle in this study, there is greater emphasis on understanding the implications of the research. In addition, and although this study is the final primary research study in the Prof D, the need to learn and adapt from the findings is vital and underpins the proposed actions (see next section), but also the continuous improvement thereafter, some of which will be discussed in the

conclusion. Moreover, this learning and adapting also relates to myself as a researcher, as I reflect on what went well, what I have learnt about conducting research, and what I can still develop further in the future. This will also be covered in detail in the conclusion section of the thesis. Figure 27 below shows the concept map following this study.

Figure 29 - Concept map study 3



Links to Professional Practice – Impacts on Practice

The five themes discussed in this research have impacted positively on practice within the research setting. To start with, the requirement to review the previous iterations of the digital development programme continued and was redeveloped following the subsequent discussions with Professor Kirschner. Much of the detail within the five themes cumulatively supported the enhancements to the programme, for example, the understanding of what different modalities offer, and how the tools within the modalities can be utilised to implement practice based on

effective instruction. Moreover, the programme was re-designed to model best practice in online environments, utilising Mayer's principles (Fig 25 & 26), with for example, the segmenting principle influencing the short videos created within each learning content, and the personalization principle when narrating over the short clips. Additionally, a greater and continued onus was placed on ensuring that teaching staff have a good knowledge of how we process information, as this underpins effective delivery irrespective of the modalities used. This links to several of the themes, especially theme five, where understanding effective instruction and learning principles is a

prerequisite for then developing digital skills and knowledge. The figure below depicts the key concepts.

Figure 30 - New Digital Development Programme

THE SHEFFIELD COLLEGE

DIGITAL DEVELOPMENT PROGRAMME

INTRODUCTION TO THE PROGRAMME

Digital Development Welcome.
Angela Foulkes

Digital Development Overview.
Steve Spence

DIGITAL EXPLORER

DIGITAL ADOPTER

DIGITAL LEADER


Figure 31 - Example of how Mayer's Segmenting Principle has been incorporated into the programme

GOOGLE CLASSROOM


DIGITAL EXPLORER

INTRODUCTION TO GOOGLE CLASSROOM

Google Classroom is the Sheffield College's VLE (Virtual Learning Environment). Developed by Google for education, it aims to simplify creating, distributing, and grading assignments and materials in a paperless way. The primary purpose of Google Classroom is to streamline the process of sharing files between teachers and students.




GOOGLE CLASSROOM - CREATING A NEW CLASSROOM



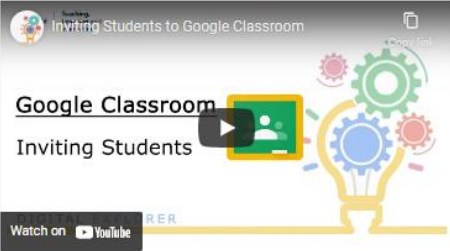
Google Classroom enables teachers to create an online classroom area in which they can manage all the documents that their students need. Teachers can make assignments from within the class, which their students complete and turn in to be graded. This video shows you how to create your first Classroom.

GOOGLE CLASSROOM - CHANGING NAME & THEME



This video shows you how to name your Classroom and to make your Google class more visually appealing to your students, how you can change the visual theme.

GOOGLE CLASSROOM - INVITING STUDENTS TO YOUR CLASSROOM



In this video, we're going to be looking at how to start inviting students to your Classroom.

Linked to the third theme is the integration of both flipped learning approaches and greater research into the use of VR at the college. In the early phases we have had several digital leader projects based on implementing a flipped learning approach, with these shared across the college. Ongoing training and support are offered to those staff wanting to know more on how best to integrate this approach into their teaching practices. Moreover, we currently have three large curriculum areas investigating the use of VR within their respective areas, linked to offering greater opportunities for students to practice their skills in high-fidelity situations. These advancements have been made possible through the outcomes of this research study. Pleasingly, and as a by-product of this research, the college were successful in a bid worth close to 100k to investigate VR, this is further supporting our implementation of VR within the curriculum¹⁷.

Theme four was concerned with the social aspects of learning and we have currently developed two processes initially to support with this. Where curriculum areas are planning to utilise more online programmes, they have been trained to use the stream in Google Classroom and Google Chat, to replicate the social spaces that are key for supporting learning. Moreover, and through the digital development programme, collaborative tools are now included to ensure that online collaborative learning is well designed and executed.

Digital Development Programme – Third Iteration

The action research process has been valuable throughout the entirety of this Prof D, and certainly in the development and re-development of the Digital Development Programme. Following the interview with Professor Kirschner, and the subsequent data analysis, improvements could be made to the programme once again.

Following the previous and current (chapter 5 & 6) studies, the refinement of the content has been completed, ensuring that it has full impact on supporting staff in the development of their

¹⁷ <https://www.ncfe.org.uk/all-articles/virtual-reality-in-education/>

digital practices. Following the research studies, and my own reflections, the need to improve the content in the programme was a key priority, and this has now been completed. This now ensures that all sections of content for the digital explorer and adopter levels have been updated, segmented into short and manageable learning chunks, accompanied with short visual explanations and personalised for staff in the college. All of these actions were deliberate, and implemented in correspondence with the evidence base of multimedia learning (Mayer, 2001; Mayer, 2009; Mayer & Moreno, 2003). In addition, the interface was further developed utilising the embedded inclusivity tools in Google Sites, ensuring that it was inclusive for all, was easy to navigate with information in a logical order, and reduced cognitive load for users (Henry, 2007; Morville & Rosenfeld, 2006; Sweller, et al., 2011). This work resulted in a finished product that was now professional in nature, and was close to my initial ideas and vision following the start of the primary research.

The third iteration also enhanced the way in which badges were used to offer acknowledgement of progress for users. Within the now enhanced portal, individual users have an option of 'Your Record' (see Fig 27). Within this portal, staff can access and view their progress through the various levels of the programme (see Fig 28). These ideas were first considered on completion of the previous chapter (chapter 5) but have now been made a reality in iteration three of the programme. As small an improvement as they may appear, it was key in my thought process and linked back to a principle I believed vital at the start of this process, one of establishing digital development as a long-term strategy, not stand alone sessions. Acknowledging the progress of all staff was a key aspect of this.

Figure 32 - Your Record



Figure 33 - Staff can now view their progress



Finally, at this stage of the research process, the work to develop a layered system so all staff could engage and develop their practices became a reality. As stated in the early iterations, the initial stages of the programme were based on multiple choice questions (MCQs), as those stages were concerned with assessing skill and confidence. The approach to the leader level was based on case study assessments, challenging staff to show a greater appreciation of the use of technology with pedagogical practices. This aligns with Race (2001) when discussing the need for assessment to capture a holistic and comprehensive view of learning.

As I reflect now on the early submissions for the leader level, I am taken aback by the quality of the submissions. It is also pleasing to know through introspection that the constant reflections and improvements had the desired impacts, staff were committed to long-term development, and engaged in this, which is vital for any successful CPD (Darling-Hammond, et al., 2017; Scales, 2011). Moreover, the leader level also impacted on the growing community of practice discussed in the previous study, with staff coming together to share best practice. Pleasingly, the level inspired staff from all across the college, delivering a range of programmes, to conduct research and small case

studies in their area of interest. When I consider the findings from all of the primary studies in this thesis, the iterative nature of the action research methodology has enabled the programme to exceed my initial plans and ideas (see Fig 29 below, for some examples of the projects carried out).

Figure 34 - Examples of Digital Leader Case Studies

Proposal : How Immersive Technology Can Support Learning in Inclusion.

Rationale: Researchers have been exploring the potential of immersive technologies as an educational tool since at least the 1990's. AR and VR technologies are a promising and exciting addition to the growing field of education technology, because of their immersive experiences, their ability to share information in new and engaging ways, and their potential to offer virtual experiences that expand access to educational opportunities that would otherwise be limited by cost or physical distance. Edtech will transform how we learn, work and communicate in the future. (Schwarz 2017)

Using 360 Cameras in Reflective Music Practice

Introduction

Sheffield College's Music Department has used video as a tool for reflective practice for many years. Following student performances, video is recorded as assessment evidence and students watch these videos back in order to analyse and evaluate their practice. There is a problem though - following the 'high' of being immersed in the energy and atmosphere of a performance, the watching of the video has always been an anti-climax. It is not uncommon for students to refuse to watch the video, for other, the anxiety is palpable.

Current challenges with using video recordings in reflective practice:

- People don't like the sound of their own voice ([Kleinberger, N.D.](#))
- Relationship between a live audience and a screen is very different, effecting engagement ([Bergeman, 2019](#))
- Video quality compromises engagement (atmosphere is not captured well on poor quality video camera, audio quality is often poor) ([Dobrian, F., Awan, A., Joseph, D., Ganjam, A., Zhan, J., Sekar, V., et al. 2011](#))

Aim and Rationale

Aim - to assess the use of the HoverCam in vocational science teaching to support practical aspects of teaching and learning.

Rationale - many students have lacked hands-on access to practical learning during COVID lockdowns and the use of the HoverCam combined with a flipped learning approach could help to promote confidence and competency in practical science. The HoverCam can also aid demonstration of techniques or practical methods during lessons, enabling clearer access to the visual for more students.

To finish, and linking back to the first research study (chapter 4), ensuring a whole-college vision and support from the executive team at the college was identified as a factor for future

success. With this in mind, and to acknowledge the progress of staff at the higher levels of the programme, a graduation was planned and implemented, and attended by the Principal and Chief Executive Officer, and the Deputy Chief Executive and Deputy Principal. Staff received a chance to share their projects with their cohort, and received a gift and signed letter (see Fig 30).

Figure 35 - Graduation Letter



**Office of the Chief Executive
& Principal**

The Sheffield College
Granville Road
Sheffield
S2 2RL

T +44(0)114 260 2664

angela.foulkes@sheffcol.ac.uk
www.sheffcol.ac.uk

Chief Executive & Principal
Angela Foulkes

August 2021

Dear Liam,

Re: Digital Leader Graduation

On behalf of the College, we would like to say a huge thank you and congratulations for graduating through the Digital Leader Programme. Our digital development as a College has been great to see, and with so many excellent projects completed through the digital leaders programme this is set to continue.

The dedication you have shown to complete your case study on top of everything you do is fantastic - well done! The College is fortunate to have dedicated staff who want to develop, innovate and give our students the best possible learning experience. We are delighted with our digital transformation and look forward to supporting this further in the future. It will also be great to see you influencing your peers as a digital leader, developing peer networks and communities of practice, and also utilising the Innovation Centres at our Hillsborough and City campuses.

Keep being innovative, keep being curious and keep pushing the boundaries to give our students an excellent experience at The Sheffield College.

Best wishes,



Angela Foulkes
Chief Executive & Principal



Anita Straffon
Deputy Chief Executive & Deputy Principal

Research Reflections

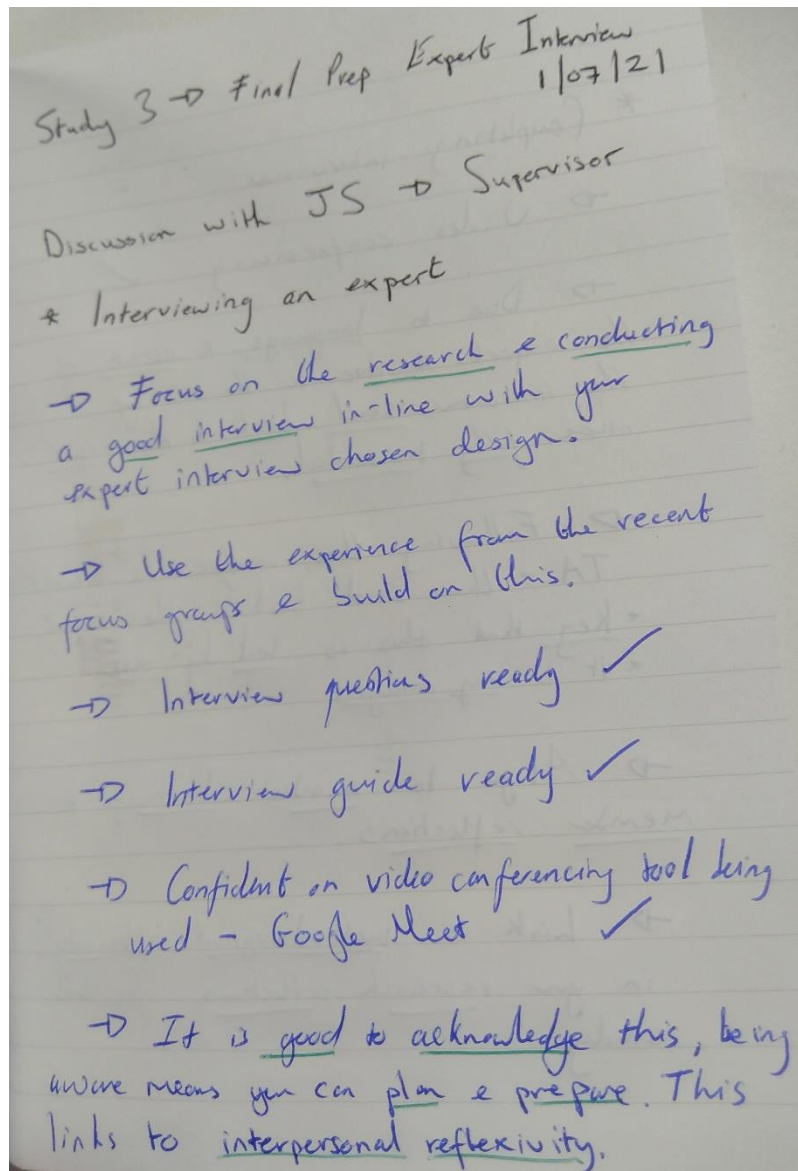
As with the previous two studies and to enhance the research and me as a researcher, reflexivity was employed throughout, with notes, memos, and reflections through collaboration with my research team underpinning this. The two approaches pertinent to this study were interpersonal reflexivity and methodological reflexivity.

In terms of interpersonal reflexivity (see figure 34), I was interviewing a renowned leader in the field whose work I have read for many years, and that was a little daunting in some respects. I was aware that I had to focus on the research, not the person I was interviewing, who I have great admiration for and who I was very surprised and thankful took part in the interview. However, I could not let this influence how I conducted the research and I had to ensure that I led the interview through the questions and probes that I required; I could not stop a line of probing that I wanted to follow due to my admiration for the professor. Being well aware of this meant I prepared well; I ensured the interview questions were developed in advance along with potential probes that I may use. It also meant that I could practice in advance the interview questions so I became confident with them. This preparation stopped me from focusing on the expert, and for want of a better phrase becoming 'star struck' during the interview. Certainly, this preparation was key, and once the interview commenced, I felt in full control as the researcher, which was vital. I will employ these strategies in the future if I am ever fortunate again to interview an expert, and someone who I admire for their work in the field.

Building on my previous reflexive actions from the first two studies, I once more distanced myself to view meanings from afar and develop my own criticality of research. I considered two points when choosing an expert. Firstly, and although I believe I followed the process for selecting and then implementing an expert interview well and in correspondence with the literature, the decision to use Professor Kirschner was one a deliberated on. This was mainly because the number of experts in the field is vast, but I was keen to get the balance of someone who did not reside in the

technology camp, or the education research camp, as I felt this would bias the results. Professor Kirchner has a considerable résumé in the fields of education, cognitive psychology and online learning. From this perspective he was the perfect choice to be the expert. However, and although the data is detailed, and the themes were devised from the previous studies to form part of the reflecting phase of the action research cycle, the option to interview another expert is something I would now consider through critical reflection. I think this would have proven a good opportunity to delve deeper into certain points, and potentially develop contrasting viewpoints. Still, the use of Professor Kirschner was effective for the reflective phase of action research. Aligning each study to the various phases was a strength of my methodology, as it gave a nuanced approach to each study, with an obvious example of this the data collection method in study one focused on surface level explorations with a large sample, to the confirmatory approach through interviewing an expert in study three.

Figure 36 - Notes from discussion with supervisor regarding interviewing an expert



In addition, methodological reflexivity was also implemented within this study (see figure 54). Having decided on the expert interview method I once again chose to utilise the same video conferencing tool to record the interview to support with the subsequent analysis. This was certainly a positive. Due to the nature of interviewing an expert, I had to ensure that they were happy with the data but at the same time that it was driven by me. To accomplish this, I sent the full transcription to the expert once this had been completed, but prior to analysis. Once the transcription had been agreed as accurate, I then completed the analysis and built the key themes, but it was important I drove this aspect of the study. On completion, I then shared with the expert

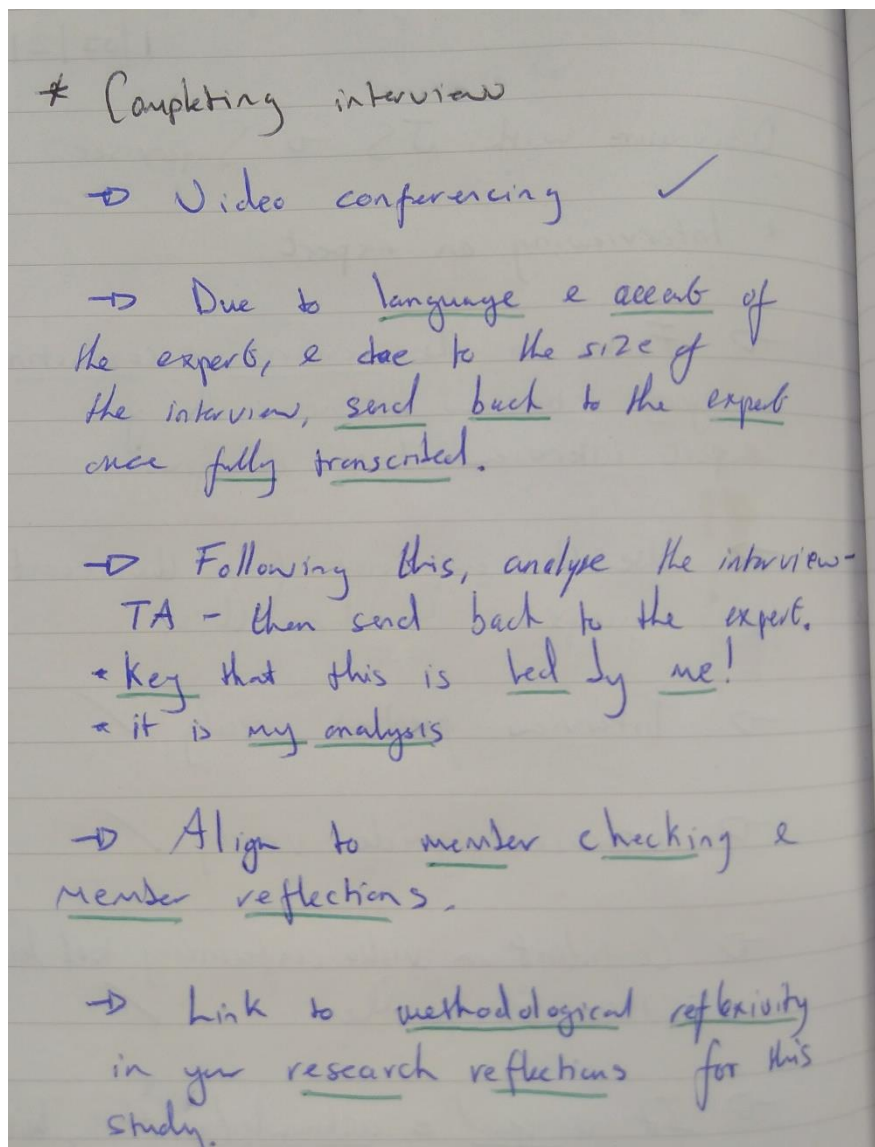
once more, but on the directive that the themes have been developed from the full transcription, and that changes would only be subtle, where confusion through language may have occurred. This worked really well and the expert was happy with the portrayal of data, and helped correct some small issues, mainly down to language, in terms of pronunciation and meaning (expert is Dutch). The preparation and clear and explicit communication with the expert prior, during and after the research guaranteed that the data was mine (as the researcher), and not simply a conversation with an expert. This was fundamental for the research, and was the final piece of the primary research for my doctoral thesis.

I did debate the process of member checking and member reflection. I found this particularly difficult in the context of this research, interviewing an expert. The strategies above were well considered and implemented, but it was one of the only periods during the Prof D that I felt vulnerable, for several reasons. Firstly, as much as I tried to mitigate against it there was no doubt I had a heightened appreciation toward the expert. I was aware of this, which I believe was a good thing, but also have to admit this admiration may have impacted on certain aspects of the study.

I was obviously delighted when Professor Kirchner agreed to take part in the study, if not somewhat surprised, and I was desperate for nothing to go wrong and have him withdraw. Although many strategies were implemented (see early paragraphs), my actions, including the data analysis could have been influenced by my admiration. Like bias, I have to accept the admiration may have influenced how I analysed the data, and the subsequent use of member checking. Although, having Professor Kirchner confirm the verbatim transcriptions and then the subsequent analysis was a good strategy. I am pleased that I implemented this, and this was due largely to my reflexive development as a researcher, constantly asking questions at all stages of the research process. I was aware of the threat of withdrawal of Professor Kirchner, and this did lead to the transcriptions and analysis happening quickly. In addition, my vulnerability at this point stopped greater considerations

of using an additional expert, as I was concerned this may impact on Professor Kirschner's involvement. However, to be critical throughout all aspects of the research highlights the developing strength of me as a researcher, and I am confident that the use of just Professor Kirschner was a good way to collect data through the reflective stage of action research, and influence the policies and procedures developed as a result of the research.

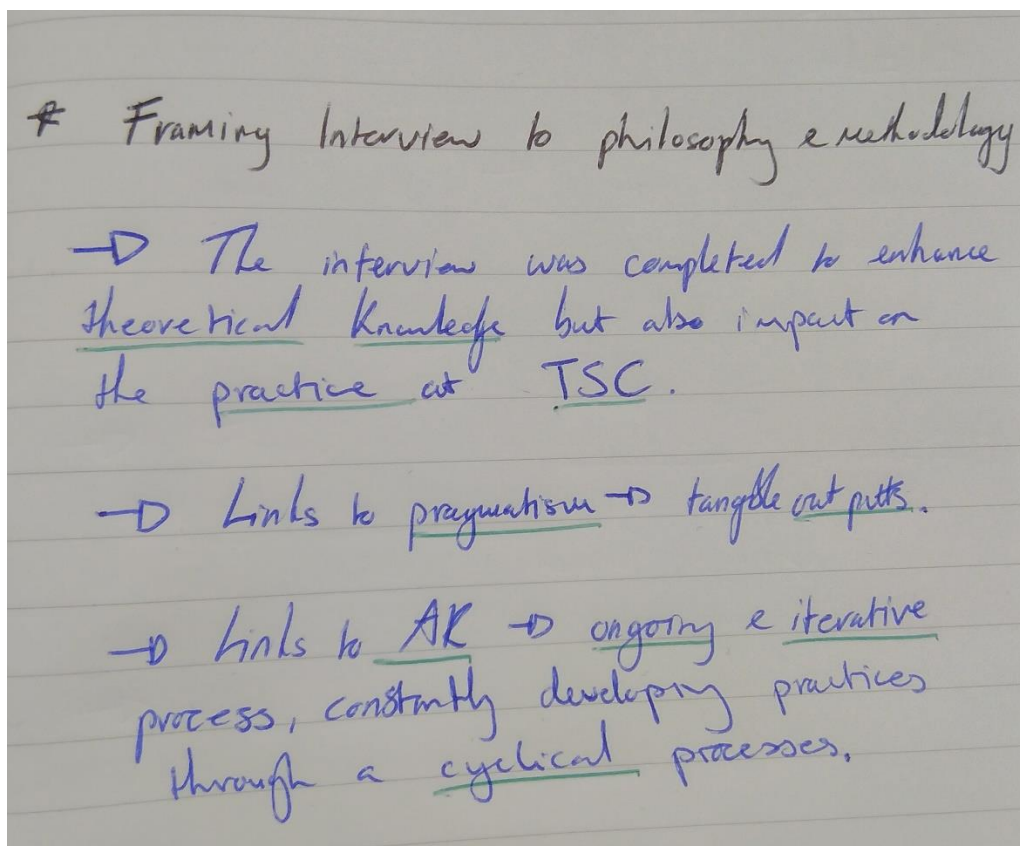
Figure 37 - Notes from discussion with supervisor regarding conducting the interview



A final thought in terms of methodological reflexivity was the importance of using the expert interview in correspondence with the overarching philosophical and methodological approach of the entire thesis, that of pragmatism and action research (see figure 36). This was something that I wanted to establish, as it was important to have commensurate expectations in terms of the

tangible outputs of this study to the preceding two studies. It was important not to see this as a standalone expert interview, or an expert interview that would only give theoretical knowledge. This would be the case but the new knowledge garnered needed to be positioned to develop practice in the research setting – The Sheffield College. What is explicit from this research study is the benefit of the action research approach continuing in an iterative process to continually hone and improve previously established initiatives and strategies, as detailed above through the vast improvements to the Digital Development Programme. This has been a vital takeaway for me as a researcher.

Figure 38 - Notes from discussion with supervisor regarding situating the expert interview with pragmatism and action research



Chapter 7 - Dissemination

Dissemination and Impact on Professional Practice

The decision to study a Prof D as opposed to a PhD was deliberate, and as I reflect now it was the right choice for me personally. My beliefs into what research should do have strengthened throughout this Prof D, and I have been able to develop my approach to research in correspondence with the correct philosophy and methodology. This has been useful in my transition as a researcher.

The requirement to influence professional practice was key in my decision to study a Prof D due to my beliefs and the sector I work in. The FE sector, and my role within it, very much require research to drive and inform future practices. Through studying this Prof D, I was able to accomplish this, underpinning everything with a detailed theoretical framework and research methodology.

This chapter highlights and emphasises the impact the research had on professional practice, something I am very proud of. I believe this section vital in showing the demonstrable impacts of the research in my context. Each of the sections below are of vital importance, for example, the need to improve outcome data is imperative within a college, as is gaining positive external recognition. Moreover, personal recognition is also important to acknowledge the impact of the research in the sector. Finally, and to end the chapter I include a range of testimonies from staff at all levels of the college, as I believe this gives a viewpoint of the impact of the research in the setting it was completed.

The Sheffield College – Impact on Data, Outcomes and Progression

The research for this Prof D was carried out entirely at my current place of work – The Sheffield College. Although there is an appreciation of the causation and correlation principle, and within the operation of any educational institution many variables impact on success, without question the outputs of this Prof D have been hugely beneficial to my employers, especially considering that much of the research and subsequent actions to develop the use of digital and online pedagogy occurred during the pandemic. The research was of paramount importance in enabling the college

to catch and over take many other colleges in the sector, as emphasised through the rapid improvements in outcomes, displayed below:

- In 2020/21, the second year of results impacted by Covid-19, the college achievement rate was 88%. This was an increase of 4pp on 2019/20, where achievement was 84%; an 8pp increase from 2018/19 where achievement was 80%; and an impressive 11pp increase from 2017/18, where achievement was 77%.
- In 2020/21, the college pass rate was 92%. This was an increase of 2pp on 2019/20, where pass rate was 90%; a 7pp increase from 2018/19, where pass rate was 85%; and an impressive 10pp increase from 2017/18, where pass rate was 82%.
- The above outcome data placed the college above national benchmarks.
- 94% of students and 99% of apprentices progressed into positive destinations following studying at the college in 2020/21, another excellent achievement for the college.
- Pleasingly in 2020/21, the achievement of students with high needs in the curriculum also increased by 9pp when compared with 2019/20.

The above emphasises the impressive improvements to outcome data that all FE colleges are measured against. More impressive is that this was achieved during a time when a high percentage of delivery was carried out online and through blended methods. I am certain that this would not have been possible without the research carried out in this Prof D that commenced prior to the pandemic, which enabled me to lead the college at pace through the transformation, something other colleges could not do. This improvement to data moved the college from significantly below the national benchmarks to above for the first time in several years. The impact of this is in some way immeasurable in terms of impact, especially as the college have operated below the national rate, and as a 'requires improvement' college as judged by Ofsted for so many years. Although education is more than data and numbers, this impact was imperative, and is a strong indicator of the impact the research had on professional practice.

The Sheffield College – External Recognition

Directly related to the research that underpinned this Prof D, the college have achieved some pleasing external recognition. This is detailed below:

- The college were recognised in the EdTech 50, a prestigious accolade that is awarded by an independent panel and spans the entire educational landscape, including school and university education. In 2020, the college were recognised in the 'ones to watch category', and in 2021, the college made it into the final 50 for the first time, an excellent achievement.
- The college were asked by the Skills Education Group (SEG) to lead training on the use of education technology to support the many providers in the sector during and post-pandemic. Training was carried out online in 2020 and a conference was hosted at The Sheffield College in March 2022, highlighting our standing as leaders in our use of technology to enhance learning.
- In 2021, the college won the Edufuturists Award for Employer Engagement for work related to the use of VR, developed through the Digital Development Programme.
- In 2021, the college achieved Google Reference College status, international recognition for the implementation of Google Enterprise for Education.
- In 2021, the college were one of only three successful bids to gain funding from the NCFE as part of the Assessment Innovation Fund project, gaining 100k to investigate the use of VR on assessment. A deciding factor in this success was the reputation the college had developed for its positive use of education technology.
- In April 2022, the college were commended in the innovation category at the Educate North Awards, for the work carried out on digital transformation and development.
- In October 2022, the college were successfully shortlisted in the 'Innovator – Best new product/service' category at the Sheffield Business Awards 2022, going on to win the award in December 2022. This was a huge accolade for the college.

- Finally, and in many respects one of the most important achievements for the college, was being recognised as ‘Good’, in all judgement areas by Ofsted following inspection in December 2022. The pressure for the college, the governing body and the senior leadership team was intense and had been for several years, due to the college being recognised as ‘Requires Improvement’ since 2016. Although accepting there were many contributing factors, this result would not have been possible without the outputs from this programme of research, that enabled the college to improve outcome data during the pandemic.

The above external recognitions are so important for a college in the FE sector, especially one on an improvement journey. To receive awards and recognitions for the work completed throughout this research is exemplary, especially as the college had never achieved these feats previously, for example, the EdTech50. In addition, leading sector training and offering support to other colleges in their transformation and development of their own digital practices emphasises further the importance of the research in this thesis. Finally, it cannot be underestimated how important the Ofsted visit was, and the research completed as part of this Prof D had direct impacts on the success of the visits, but also wider benefits acknowledge during the visits. In professional practice, this is a huge acknowledgement of the impact of this research on the several Ofsted visits over the duration of the research, with some evidenced below:

‘They have supported staff to develop their skills and confidence in delivering remote learning through an extensive programme of professional development. Leaders hope that, as a result, staff will become more innovative in their approach to remote learning as their practice develops.’ (Ofsted, 2020)

‘Leaders have put in place a supportive staff development programme to raise standards in teaching and learning. Over recent months and as a consequence of the COVID-19 pandemic, the programme has been adapted to help teachers improve their digital skills. Teachers now deliver an increased volume of the curriculum online. They use a wide range

of online resources and activities to help learners gain the knowledge and understanding that they need, to identify gaps in learning, and to assess learners' progress.' (Ofsted, 2021)

Personal Recognition, Conference Appearances and Publications

Although much of the above was driven by me and the research completed as part of the Prof D, I have chosen to list it as college recognition due to the sheer scale and impact that went far beyond just me and my direct reports. Within this section, I will focus on accolades directly related to me throughout the completion of the Prof D:

Conferences:

- I presented as part of the keynote panel at the annual Society for Education and Training (SET) conference in November 2019.
- I was part of an expert panel at the 'New, Next, or Never Normal' online conference in June 2020, an internationally attended event hosted by C-Learning and EduFuturists.
- I presented at the Festival of Education in June 2021, discussing digital transformation and how technology can be used effectively to enhance curriculum design and delivery.
- I was keynote speaker at Bedford College Group's Higher Education Conference in June 2021, again discussing how technology can be used effectively and the importance of developing staff.
- I was part of a keynote panel at a conference hosted by the Westminster Education Forum on Computing in England's schools in July 2022, discussing the importance of strategies for digital transformation.
- In March 2023, I was invited to speak at the House of Lords on Artificial Intelligence, joining an esteemed panel, with delegates spanning a range of international governments.

Publications:

- In June 2020, a section adapted from the literature review in my Prof D was published to an international audience through FE News, a channel that has close to 200k unique visitors over the period of a month. The article was titled 'How evidence-informed practice and EdTech can intersect to support learning'¹⁸.
- In April 2021, a follow-up article was published by FE News titled 'Opportunities on the horizon for the quality of education'¹⁹.
- In December 2021, an article was published in the Education Technology Insights online journal that has over 31k subscribers worldwide. The article was titled 'Staff Development Vital for a Successful Digital Transformation'²⁰.
- I have written a chapter in the book 'Great FE Teaching – Sharing Good Practice'²¹, edited by Samantha Jones and published by Corwin, a Sage publishing company. The chapter is concerned with digital transformation.
- In March 2023, I had an article published in FE Week²², giving a snapshot of how digital development can be accelerated at an institutional level.

Although I am delighted with the external recognition for the college the specific internal recognition detailed above is also important for emphasising the impact of the research. To speak at the number of conferences and achieve the number of publications detailing the research completed is a great achievement. I know that through doing this the impact of the research supported the sector and, in many cases, reached a wider audience. As I reflect now, the knowledge

¹⁸ Article available on the FE News site here <https://www.fenews.co.uk/exclusive/how-evidence-informed-practice-and-edtech-can-intersect-to-support-learning/>

¹⁹ Article available on the FE News site here <https://www.fenews.co.uk/exclusive/opportunities-on-the-horizon-for-the-quality-of-education/>

²⁰ Article available here <https://edtech-europe.educationtechnologyinsights.com/cxoinsights/staff-development-vital-for-a-successful-digital-transformation-nid-1653.html>

²¹ The book is available here <https://us.sagepub.com/en-us/nam/great-fe-teaching/book279504>

²² Article available here <Edition-418-digi.pdf> (feweek.co.uk)

and experiences gained throughout this Prof D were vital in supporting me to gain these acknowledgements. For example, my knowledge of research philosophy and methodologies was salient in gaining this success, as was developing theoretical knowledge and confidence in preparing extracts.

The external recognition gained by the college and myself personally, as a product of the research completed as part of this Prof D, emphasises the influence on practice within and beyond my own sector of FE. This coupled with excellent outcomes achieved at the college during and following the research, offer further evidence of the impact this research had on the institution where the research was completed. This is supported further in the testimony section below, which make explicit how the research impacted on a range of staff at various levels of the institution. This is included as a further mechanism for showing the impact of the research, from the viewpoints of others, something I feel is very important. I am confident that when this is added to the previous sections, the impact of the research is very explicit.

Testimonies

Angela Foulkes – Chief Executive and Principal of The Sheffield College

Our digital evolution over the recent years has been one of the most pleasing aspects in our development as a leading further education college. The pace of change commenced prior to the pandemic but was clearly key for our success during and now post pandemic. I have been as excited as anyone to trial new technologies, and it has been a real joy to witness our staff fully engaging in a thorough programme of development. From afar, we have had a clear vision and strategy that has supported everyone in the institution to feel confident in using technology effectively in their own practice, and this has been a huge positive. Steve, through this research has been integral in working cross-college and with various departments in curriculum and professional services to enact tangible changes that have had great impact. Additionally, Steve's enthusiasm towards research and continuing development has positively influenced others across the college to follow this lead, with

many staff now more engaged with research within college and across the sector. Finally, I remember recording a short video clip for the first iteration of our Digital Development Programme in the summer of 2020, and it was great fun, but the impact really has been felt across this college. As with all of Steve's research, it is carried out to influence and enhance practice, and that has certainly been the case for his research at The Sheffield College.

Anita Straffon – Deputy Chief Executive and Deputy Principal of The Sheffield College

The research completed as part of this professional doctorate could not have been timelier, with a focus on digital and educational technology just prior to a global pandemic. I often joked with Steve in the infancy of the pandemic that he knew something we all did not, as his research became more prominent with each passing day in 2020. As someone who is ultimately responsible and accountable for the curriculum at The Sheffield College, including curriculum design and delivery, I need to see the results of research, and in many respects, research needs to give tangible outputs. I appreciate that numbers and outcomes for students do not tell the whole story of an institution's educational offer and purpose, but ultimately, if initiatives and research are put in place, they should have a positive impact on the outcomes of our students. Steve with his programme of research for his doctorate, and for the entire time I have known him, has always been a keen advocate of research and how it will help in practice, and this is why he is unique to the sector – his research brings about tangible changes to the practice of an institution which makes a positive impact. Throughout this research, the college have significantly improved in the use of technology to support learning in a variety of ways. We now have a much better approach to our virtual learning environment and a set of digital tools that all staff engage with, as opposed to a select few. Due to this strong foundation, we are now seeing many staff push the boundaries with their students, through, for example, virtual reality and artificial intelligence. In addition, Steve's approach to research galvanises others to be a part of the community, supporting a culture of curiosity amongst staff. He also played a key role in developing the online review process to support with the rapid

improvement of online practice during the pandemic, which supported us to have confidence that our workforce were confident in teaching online, and where development was needed, staff could access it. During the pandemic, our year-end results improved to a college high that has never been achieved before, and by the end of the 2020/2021 academic year, our pass rate for students was 92%, which for the sector and The Sheffield College is a fantastic achievement. I am in no doubt that Steve's research played a key role in helping us achieve this.

Elise Temple – Vice Principal for Quality at The Sheffield College

I commenced employment at The Sheffield College in January 2019, at a time when the college was at the start of an improvement journey, and as part of a new leadership structure put in place to achieve this at pace. Although data does not tell the whole story of an educational institution's impact, for me in my role it is important, and something I rely on. The senior leadership team that I joined at The Sheffield College was new and we had a remit to improve the quality of education, and that for me would mean an improvement in the number of students who complete their programmes of study whilst at the college. Over the recent reportable year-end positions, our achievement data improved from 77% in 2017/2018, to 88% in 2020/2021, an 11pp increase. In the same time period pass rates improved from 82% to 92%, a 10pp increase. Having worked in senior quality positions at a range of institutions, and having a network of peers in similar quality roles, this improvement is quite simply excellent; especially in the timeframe it was achieved. The improvements emphasise the enhancement in the quality of education students now receive at The Sheffield College, and although there are many variables that will help with this, I can say with utter conviction and certainty that the impacts of Steve's research were a determining factor in the improvements, especially as the improvements occurred at a time when much of our delivery was online and blended. Steve was already one step ahead with his strategic ideas following some initial data collection, and his big achievements that took the entire college on a digital transition were the move to one virtual learning environment for teaching and learning; and then building and

implementing a training programme to support staff to feel comfortable in using digital tools in their practice. Additionally, his research into effective online practice was vital in ensuring we had a quality oversight during the period of lockdowns and that staff were supported at pace to develop their practice. I have always joked with Steve about educational research as I know this is something he is passionate about. I used to say 'why do professors spend years doing the research when the outcomes have little impact in practice in the sector', however, I will happily confess that Steve's approach to research has been brilliant for the sector and achieves what I believe research should, it positively influences and changes our practices for the better.

Simon Sharratt – Digital and E-Learning Team Coordinator at The Sheffield College

As a digital and e-learning technologist, and now as the coordinator of the cross-college team, I have never felt as transparent about our role with teachers across the institution as I presently do. Steve has worked closely with us and detailed a clear programme of development, ensuring that our digital and online training moves beyond one or two sessions that staff can opt to attend or not, to a fully-fledged strategic programme of development. This has made a huge impact on the engagement of staff, as we have moved away from 'sheep dip' approaches to systematically working with individuals and teams over a prolonged period of time. In addition, through the research that Steve has completed, we have really tried to understand the technology better from the perspective of the teachers, where they now define what they need to accomplish pedagogically (as Steve would say!), and we support in showing a range of tools and alternatives for this to be accomplished. For the team and I, we have genuinely felt a huge change in approach following Steve's research, and it has certainly been a real positive. As a team, we also now feel very valued at the college, and in many respects are front and centre, leading our state-of-the-art innovation centres at both our main campuses. Although quite a simple piece of research, the survey Steve carried out to triangulate student voice and observation data was crucial in the college's transformation, as we have now been able to move at pace with tools aligned to one product. This

has been a huge help as previously we had to support with Moodle, Google, Blackboard, Microsoft and more, and then on top of that all the tools and products that aligned to them. Steve's research gave a clear vision for all staff and was fundamental in allowing us to work at pace to train, develop and support the staff, which was absolutely key to our success throughout the pandemic.

[Jeanette Bell – Lecturer in Inclusion at The Sheffield College](#)

As a very experienced teacher of inclusion, the support and training I have benefitted from over the recent years at The Sheffield College has been wonderful. I never thought that I would be so comfortable in using digital tools to support my students and enhance their learning. I worked through the digital programme at the college, and completed my leader programme by investigating through a case study how virtual reality could enhance my delivery and the students' experience. I am now confident in using technology in person with my students as well as teaching online, and developing opportunities for students to learn through my virtual learning environment. The ongoing programme of support has made this possible, and the use of virtual reality has been brilliant for my students. The best example of this was to support one of my groups who have special educational needs and disabilities to attend a residential. Initially my students were not confident about the trip and were anxious. Through the support of the digital team, I created a virtual tour of the residential, which the students and their parents viewed through virtual reality. Following this, the anxiety levels of the students reduced and all students attended the residential, which was crucial to their development. My own digital development has been really rewarding, and I know I speak on behalf of many staff in saying our digital transformation has impacted really positively on our students.

[Abby Bruce – Lecturer Animal Care at The Sheffield College](#)

I have always been a confident user of digital tools, and I have really engaged and enjoyed the digital transformation at the college, led by Steven Spence. What I have enjoyed and benefitted from the most is the pedagogical focus applied to online delivery. This aspect I have found very

useful, and the focus has always been the pedagogy to support students to learn through the use of technology, not simply have fun or enjoy technology. In simple terms, the technology must have a clear purpose. This has influenced me to consider the key principles educational research has shown us over many years to support long-term learning. A good example of this has been the use of retrieval practice, that I have been able to develop in my teaching through a range of technology that permits methods for recapping learning. Additionally, the great thing with using technology for embedding retrieval practice is that recaps can be set overtime, repeated and released at optimum points to reduce the chances of students forgetting key content covered. I continue to use and develop my practice with technology in correspondence with the research and fully appreciate the insights I have gained through working closely with Steve. The college are fortunate, especially in light of the pandemic, to have someone who is an expert in the use of technology to enhance learning.

Chapter 8 – Thesis Conclusion

Chapter 8 – Thesis Conclusion

Introduction

The final chapter brings together the full body of work completed on this Prof D. The conclusion starts by covering the outcomes of the research and what they mean in my professional practice. This section of the conclusion is rounded off by suggesting ideas for future research. Importantly, the conclusion is completed with a reflective entry, in many ways an explorative critique of me as a researcher throughout the Prof D. The critique will naturally align to the overarching aims of the thesis, but take the reader through my thought processes during key aspects.

Research Outcomes and Impact on Professional Practice

This programme of research as part of a Prof D aimed to ensure that the primary research carried out impacted directly on professional practice. Aligned to this aim was the philosophy of pragmatism and the action research methodology, enabling the research to be contextualised and grounded in practice. Moreover, pragmatism enabled scope to utilise the most appropriate approaches to finding the answers to clearly defined research problems (Tashakkori & Teddlie, 1998), with action research supporting key stakeholders (Stringer, 2014) and practitioners to contribute and enhance practices through simultaneous research and action (McNiff, 2017).

The first research study focused on initial explorations into remote learning as a response to Covid-19. It is important to state that enhancing the use and implementation of digital and online tools was planned prior to the pandemic, but following the challenges proposed by the pandemic the need for the research accelerated at a rapid pace.

The first research study collected data through a survey, with 254 staff sampled through stratified random sampling. The survey was presented in a way that was inclusive to all participants and used a series of fixed, dual, and rating responses, enabling clear data to be gathered (Stringer,

2014). Within the research a detailed explanation of the use of Likert Scales is offered (see page 78), but an underpinning consideration was that the survey creation was largely dependent on the need to answer the specific research questions of the study (Chyung, et al., 2017). Descriptive statistics and graphical representation were then used as the methods of analysis to give an excellent foundation for discussion in-line with the research questions. Inferential statistics were not used due to the requirements of the study, and for the research the sample size and subsequent analysis would be confused by p-values, standard errors and confidence intervals (White & Gorard, 2017).

Within the results section each question was analysed and discussed, offering an excellent starting point for the entire Prof D programme of research, and ensuring that initiatives implemented following the study were based on evidence. This study was crucial and gave an excellent foundation with tangible outcomes that would impact practice immediately. The first two main findings of the research study were interlinked, with a clear requirement to enhance the digital skills and confidence of delivery staff within an institution important for success, subsequently meaning the necessity for institutions to prioritise developing a process that supports all staff to improve their use of educational and digital technologies. Following on from this, the next two main findings were again interlinked, with strong leadership imperative for a successful digital transformation, with digital skill development placed on the same pedestal as other qualifications. Thus, the development of digital capacities and practices becomes closely linked to pedagogical discourse and is not reactionary, helping to move beyond emergency remote teaching to effective online delivery. Aligned to this is the need for a clear vision and strategy for the use of education technology, online practices and the implementation of a virtual learning environment (VLE). These main findings were of course salient to the college where the research was carried out, but should also be recognised by the many educational institutions at all levels of education as key points to consider as part of any digital transformation or evolution they may be considering. Also significant, was the importance of my own critical reflections throughout the research process, ensuring the

cyclical nature of action research continued to refine the outputs from this study into the forthcoming studies.

As discussed above, the need to take the findings from the research and ensure they had impact on practice was a key aspect of both the research paradigm used, and the requirements of the Prof D, a programme that was undertaken due to the need to influence practice within a setting.

The outputs from study one were the initial design and implementation of a layered and tailored digital development programme, designed and created internally at the college. The programme was developed in such a way that it was accessible to staff at all levels of confidence and skill in terms of their digital starting points, ensuring that a key underlying principle was achieved in that technology is for everyone, not just a the few. Additionally, by recording a range of training sessions that met part of the differing levels of the programme, it supported staff to work asynchronously back through a range of materials, although it was acknowledged at this point this could be improved in future versions of the programme.

Following the design and subsequent implementation of the programme, the following two outputs were again based on the research findings and the involvement of the executive leadership team at the college. Firstly, they supported the launch and intent of the digital development programme, and then supported with a clear vision for our future use of digital tools and VLE. These two aspects may initially seem less substantial than the digital development programme, but were vital in reality in supporting the digital transformation at the college. Having the Principal and Chief Executive of the college engage with the programme helped raise the importance of it to all staff, ensuring that it was recognised as an institutional priority. Finally, the strategic move to one set of digital tools and VLE, gave all staff a clear direction of travel for the proceeding years, and helped align the pertinent intra-departments who are important in the implementation of a VLE.

The first research study gave great insights into the experiences of staff following the requirement to move to a process of online (remote) delivery for a prolonged period of time, and

supported with the initial development of a digital programme to support staff, and strong and clear leadership that gave a vision for the future. The second research study built on the findings and outputs from study one, and had a great focus on what effective practices looked like in an online setting. This study would prove vital and support the excellent success, defined by student outcomes that were achieved throughout the main years of the pandemic, where the majority of delivery was carried out online.

Research study two was focused on gaining a better understanding of what constitutes effective online practices, with data collected through two focus groups, totalling eleven participants. Due to the requirements of the study the participants were selected through purposive sampling, handpicked due to their specialised knowledge and characteristics (Cohen, et al., 2017) regarding online practices.

Following careful analysis and sculpting through Braun and Clarke's (2006) approach to thematic analysis, three clear themes were generated from the data. The first theme emphasised the requirement to appreciate online TLA as different from the standard face-to-face mode that many teachers had become accustomed to using over many years. Yes, the cognitive architecture of how we learn remains the same, but the journey to achieving this is different during online delivery. Subthemes did support the previous statement, with underpinning teaching practices vital for both online and face-to-face delivery, however, it is the methods of achieving this that must be reconceptualised for successful online delivery.

Theme two identified how crucial technical skills are when delivering learning online. If institutions are serious about implementing aspects of online provision into their curriculum offer, it has to be accepted that subject and pedagogical knowledge must be accompanied with an advanced skillset of digital and online tools, to ensure that approaches and delivery can be specialised for an online modality. Closely linked to this theme was theme three, which highlighted the need for a non-judgemental culture in the promotion and development of online practices. Correspondingly, a

subtheme indicated that insecurity is a detrimental barrier when developing staff, inhibiting how they develop their skills and confidence.

As with the previous study, the research findings from study two would directly change and impact on practice within the situated college, however, it is extremely likely that these findings extend beyond the current context, and would be a useful starting point for other institutions focused on developing their online practices.

In terms of the first finding, this influenced the continued drive to have all staff engage with the digital development programme, continuing to develop their skills and confidence in order to be able to deliver effectively online. In addition, bespoke training sessions were developed and delivered to all curriculum leaders across the college, to ensure that the planning of both online and blended study was carried out effectively.

Theme two resulted in new approaches to support teacher development, with regular and ongoing opportunities to share online practices placed into the college calendar, and an online community of practice set up to extend the professional learning network at the college. The community grew exponentially and resulted in close to one hundred staff regularly sharing and discussing practices, problems and future ideas. Moreover, and although the success of the digital development programme had been tangible, an outcome from this theme highlighted the need to complete an in-depth review of the programme, to ensure that it is fit for purpose with the speed in which the digital and technological landscape had progressed throughout Covid-19. In addition, at this point a website was built so the engagement of staff could be tracked at faculty, academy and staff levels, which in many respects added to the college's intelligence of digital engagement and development.

Following on from theme three, an initiative was developed and proposed to the executive team and governing board that was subsequently signed off, resulting in a process of non-graded observations, called online reviews. This was important and a huge step forward for the college, who

up until that point had always graded observations, but the policy was amended and the process of online reviews commenced to support the development of online practices at pace. Pleasingly, at the time of writing this conclusion, the continued positive improvements of pass and achievement data achieved throughout the years of the pandemic, where online delivery was prevalent, confirms the benefit of such a process for developing online practice at pace.

The third research study continued to enhance the knowledge and outputs from the previous studies, focusing on investigating what effective tools and online learning looks like in an FE environment. The study was underpinned by the theory-generating expert interview method with renowned figure Professor Paul, A. Kirschner. Professor Kirschner is one of the leading figures in instructional design, the use of online modalities and research into cognitive psychology. The decision to approach and subsequently use an expert for the final study was one I made explicitly. I wanted to take the findings from the previous two studies, and the extensive reading I had completed on the subject and utilise the expert as a confirmatory figure, whilst still leaving some space to uncover new knowledge. This new knowledge would then be used to refine the research outputs in order to have a 'stamp of approval' on both the theoretical underpinnings and tangible outputs as a result of the research, appreciating that stakeholders at the college would be the ultimate validation of impact. This was supported by the pragmatic philosophy and the action research process, and throughout the embedding of reflexivity continued to define my development as a researcher, with every decision being made with purpose and intent.

The interview was carried out online and recorded, and lasted approximately one hour. Following this, thematic analysis was carried out (Braun & Clarke, 2006; Braun & Clarke, 2013) and to ensure trustworthiness the interview transcription was returned to Professor Kirschner, and subsequently the data interpretation and analysis, to confirm they were fair representations (Birt, et al., 2016; Creswell, 2005).

The main findings from this research further emphasised the need for reconceptualising ideas when designing and delivering online. However, and importantly, the way individuals learn and process information, their 'cognitive architecture' is the same, and it is vital not to conflate these two premises. Theme three offered hope through the use of technology to innovate delivery in a different way, for example, through the flipped learning model, or supporting students to practice more in simulated environments through VR. Theme four highlighted the importance of the social aspects involved in studying and learning in online environments, with theme five indicating that a prerequisite of effective instruction online is a good knowledge of the principles of how we learn and process information.

The iterative nature of action research was evident once more following the interview with Professor Paul A. Kirschner. The ongoing cycle of action research constantly refining and improving methods of working (Lewin, 1946) were again evident following the findings of the research. This was best exemplified through an improved and modified version of the digital development programme that was re-developed to incorporate Mayer's principles, which are so important for any online programme of study, as outlined by Professor Kirschner. In addition, there has been an increase in training focused on enhancing the knowledge of teachers on the fundamentals of how we learn, which is essential for instruction on any modality, be that face-to-face, online or blended delivery. These sessions were incorporated into the CPD schedule for all staff at the college across the academic year 2020/21, with recorded sessions also available for staff to utilise asynchronously. Once again, this further enhanced practice across the college.

Related to theme three we have had several of our digital leader projects based on flipped learning and the use of VR in the curriculum. What is pleasing here is the way that these excellent projects are growing organically, from the originators who carried out the research as part of their digital leader programmes, to a wider college network through the sharing of practice, joint practice development projects (Fielding, et al., 2005) and communities of practice (Wenger, et al., 2002).

Most pleasing is the chance to lead the sector through the use of VR following a successful funded bid, that is permitting the college to enhance the future of assessment across the sector.

Finally, the theme related to the social aspects of online learning has led to the implementation of tools such as Google Classroom and Google Chat, to offer the social spaces which are so important to support the learning experience. Collaborative tools have also been included within the digital development programme to ensure that online collaborative learning is designed and executed well. Moreover, this also emphasises the importance of the college placing one set of tools and VLE at the core of our online delivery, following the research carried out in study one.

This programme of research has been crucial in firstly establishing methodologically sound research findings, and secondly ensuring these findings directly impact and enhance the practice within one educational institution. The three primary research studies have also highlighted the importance of a pragmatic philosophy and an action research methodology, whereby research is grounded in practice, is collaborative in nature, and improves practices through the cycles that permit constant review and evaluation.

In terms of the most notable research findings and outputs, they are summarised in the table below:

Table 3 - Research Findings and Outputs Overview

Study	Research Findings	Outputs
Study One	Enhance digital skills and confidence of staff	Initial research, development and early implementation of a digital development programme
	Leadership that places onus on digital development	Gaining full support and commitment from the executive leadership team, including the Principal and Chief Executive filming an introductory video
	Clear strategy and vision for digital tools and a VLE	Following the presentation of the data obtained within study one, a defined VLE and set of digital tools was articulated to all staff which were to be used now and, in the future

Study Two	Recognising and appreciating that delivering online requires a different skillset to standard face-to-face delivery	Improvements made to the first iteration of the digital development programme and additional training for curriculum leaders on the planning and implementation of online and blended approaches
	Developing the technical skills and confidence of the workforce is vital for the successful implementation of online and blended delivery	Regular and ongoing events to share practice, the launch of a community of practice and a sophisticated tracking programme showing engagement with the digital development programme
	A non-judgemental process is vital for developing the practice of online delivery at pace	Implementation of non-judgemental observations of online delivery, known as online reviews
Study Three	Confirmation of the need to reconceptualise practice when delivering online, with the caveat that the way people learn and process information remains the same irrespective of the modality	Further enhancements to the digital development programme to incorporate Mayer's principles, for example the principles of segmentation and personalisation
	Technology can support new approaches to learning that enhances the design and delivery of curricula	The flipped learning approach and the use of VR is organically growing cross-college, enhancing the approach to curriculum design and delivery
	The social aspects of learning must be considered when designing online and blended programmes	The use of Google Chat and the stream within Google Classroom, along with other collaborative tools have been embedded into the digital development programme
	A prerequisite for any instruction is a good base level of knowledge of the fundamentals of how we learn	A plethora of CPD based on the fundamentals of how we learn has been implemented into the college CPD schedule

A final consideration is given to the generalisability of the findings of this research, as although this was never a key focus of the research, in terms of outcome or methodology, it is clear many other educational institutions will be considering developing their use of technology in some way in the future. Evidently, all institutions will have their differences that define their situation, current processes and future strategies. However, and taking this into account, aspects of the

research carried out within this thesis could be used to help inform the thinking of other institutions as they head into a digital transformation.

Firstly, the initial study would be useful for any institution in gaining an evidence base to work from in terms of their future vision. For example, it is an excellent way of gathering staff insights, but it is also useful in identifying the key people and/or departments who can make the transition a reality. Such a process would be salient in a smaller institution such as a primary school, but also in a large institution such as a university. The premise of the research is the same.

The vision to create a clear strategy for the use of digital and education technology would also support a large majority of institutions. Many questions are critical to each step in the process for all institutions, but the process of identifying a clear pathway of travel following research would support any institution on their journey. In this thesis the use of Google tools became a dominant aspect of the strategy due to the research carried out. These may be different in other institutions but the premise of making informed decisions is the imperative aspect of this.

In terms of developing staff, institutions could certainly benefit from the processes undertaken within this research in developing a digital development programme. During the pandemic a greater reliance on delivering online was required, but the research completed within this thesis really did accelerate the practices within the college at pace, and supported the development of a sector leading programme that was iterative and continued to develop through the action research cycle. Many of these changes may go unnoticed, but the nuances and subtleties that enhanced the programme would not have been included without the research, and the impact of the programme in developing staff is evident in the outcomes achieved over the period of the pandemic.

Closely related to the above is how the existing policies for quality assurance and improvement that institutions have, can be refined. Within this research a change to the college's observation policy was adapted as a direct result of the research, which was used to persuade the

executive leadership team of a better way of developing staff through observations. This is powerful, and certainly all institutions would benefit from this internal research to enhance their current policies and procedures.

In conclusion, and although the intent of this programme of research was to utilise research to develop and enhance the practices at one large institution – a general further education college (GFEC) – aspects of the research would certainly be useful for any institution who wish to develop their use of digital and education technology to offer greater opportunities through online and blended learning. Moreover, the pragmatic research philosophy coupled with the action research methodology should be considered as a strategy to embed within an educational institution as an emancipatory way of bringing all stakeholders within an institution together, to take ownership and lead improvements through evidence-based research, which results in tangible outputs.

A final consideration is that although much of this reflection is from my own frame of reference, in the subsequent sections I explicitly demonstrate through internal data, external recognition, conference appearances, publications and testimonies, the impact of the research. Utilising various forms of evidence to complete this was important for me, as I wanted both the quantifiable data measures that are imperative to all educational institutions, balanced with genuine perceptions of key staff within my institution. Through this process and the following sections, I am confident that my frame of reference of the success of the research is accurate, and triangulated by these other sources.

Future Research

From a theoretical perspective, this thesis has delineated the gap between research in education and education technology. Too often, in the literature and in my own experiences, these two camps have been opposing. This thesis has shown that a clear bridge can be made in order for technology to be utilised in-line with the evidence from research in education. Some of the most established evidence in education (Dunlosky, et al., 2013; Kirschner, et al., 2018; Rosenshine, 2012)

can be embedded into the planning and delivery of online and blended approaches to learning, utilising synchronous and asynchronous approaches.

Continuing to close this theoretical gap as well as influencing practice, further research is required for the use of more advanced technologies, and how these can be utilised in education. A great example of this is virtual reality (VR). The history of VR can be traced back to the 1800s, with Sir Charles Wheatstone's research and subsequent production of the stereoscope. Fast forward a hundred years to the 1930s and VR was the basis of Stanley Weinbaum's short story *Pygmalion's Spectacles*. Although many key events have occurred in the development of VR, the term 'virtual reality' was only developed in the 1980s. It was also in the 1980s that VR simulations were created to support the training of pilots, something that has now become synonymous with VR. Although popular games devices like SEGA and Nintendo launched VR related content in the mid-1990s, the explosion of VR in everyday society has been accelerated following Facebook investing heavily in VR, after buying Oculus in 2014.

From an educational standpoint, most would associate VR in supporting the training of pilots. However, research indicates that VR can have positive benefits in education beyond the aviation industry. For example, Zhao, et al., (2020) conducted a meta-analysis of VR in anatomy education and concluded that it is efficient in improving anatomy knowledge. Furthermore, Coban, et al., (2022) indicated in their meta-analysis that educational level, for example, school/college/university, made a difference to the effectiveness of using VR in education. Importantly, and in accordance with bridging the gap discussed above, VR can be aligned to established research in education. For example, testing and recall (Dunlosky, et al., 2013; Karpicke, 2017; Roediger & Karpicke, 2006), assessment (Black & Wiliam, 1998; Black, et al., 2003; Kluger & DeNisi, 1996; Shute, 2007) and practice (Ericsson, et al., 1993; Rosenshine, 2012).

In light of this, at The Sheffield College, I have led and established a programme of research into the use of VR that is currently ongoing. This research was funded partly through a successful bid

with the NCFE²³ and will provide valuable insights for the college, and in turn support the wider implementation across the sector. The research at The Sheffield College is focused primarily on the use of VR to enhance assessment, with three curriculum teams involved in the research – catering, animal care and construction. The VR experiences were designed in collaboration with the curriculum teams, with examples given below:

Figure 39 - Virtual Reality Experience for Catering

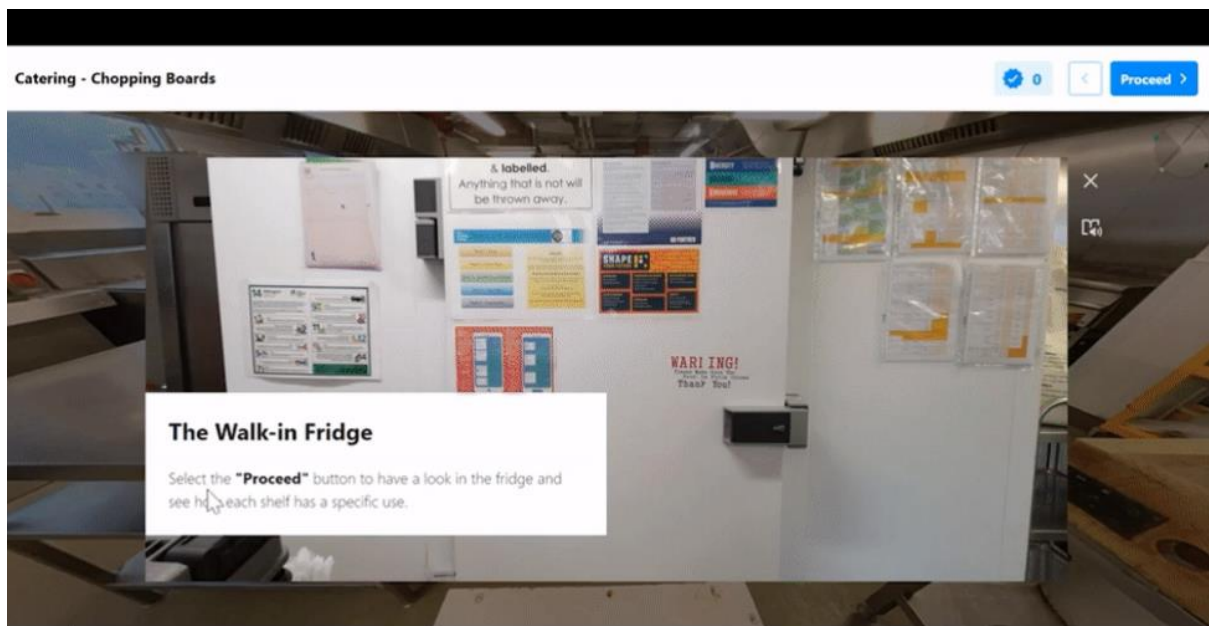


Figure 40 - Virtual Reality Experience for Animal Care

²³ Article can be accessed here <https://www.ncfe.org.uk/all-articles/virtual-reality-in-education/>

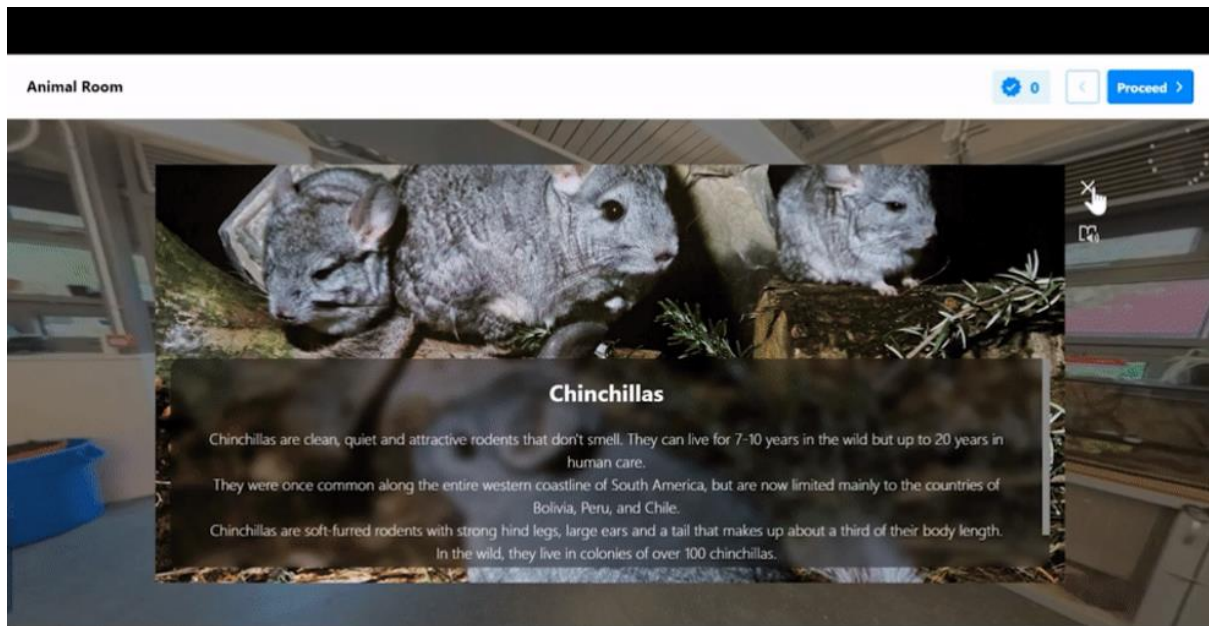
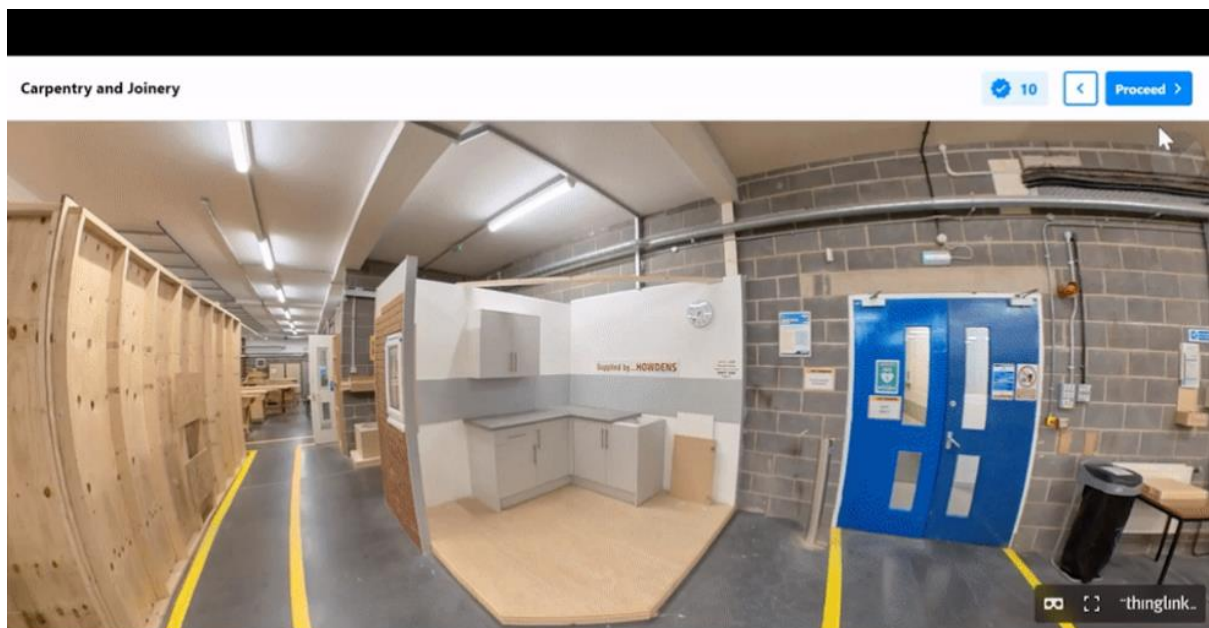


Figure 41 - Virtual Reality Experience for Construction



This research will prove pivotal for the future implementation of VR at The Sheffield College and wider sector. The research is currently still in process and continuing but will advance innovation in curriculum design and delivery in the subsequent years, if the research shows positive outcomes. It is also important to state that my development as a researcher throughout the Prof D has been

fundamental in the design and implementation of this research, along with the success in the bidding process, which was for one hundred thousand pounds worth of funding.

In addition, research on the use of artificial intelligence (AI) in education should be developed and further explored in a range of settings in the coming years. The use of AI in education has exploded in recent months with the release of Chat GPT3 (Chat GPT4 released March 2023), which has broken into the mainstream media. AI is the sophisticated process of using data to problem solve through computer science (Clark, 2020), with more interactions effectively training the machines to become more efficient. The term was first used to describe the science of making intelligent machines in 1956 (McCarthy, et al., 2006) with estimates that AI in education is expected to be worth \$6 billion by 2024 (UNESCO, 2021). AI is already in society, with personal assistants prevalent such as Alexa, and through platforms such as Netflix, that utilise AI to tailor choices to individuals (Clark, 2020).

There is clearly optimism for what AI could offer the educational landscape. From my findings and subsequent reflections throughout this thesis, and from the developing evidence base on AI, it is an area that should and will be heavily researched in education in the upcoming years. In terms of the direction of the research, the below are a good starting point:

- How can AI be leveraged to enhance education?
- How can we ensure the ethical, inclusive and equitable use of AI in education?
- How can education prepare humans to live and work with AI?

(UNESCO, 2021, p. 13)

The above are generic and give a good starting point, but from my perspective the research should be developed and implemented in the FE sector to have greatest impact. Specific to FE, examples of learning systems based on AI are already in use in the sector, for example, Century²⁴.

²⁴ <https://www.century.tech/>

There is certainly scope for research into how AI can support students to learn and help teachers in the delivery of learning. In addition, with the increasing workload and demands placed on the education sector (Department for Education, 2020; Department for Education, 2022), AI could be an excellent option to enhance systems and the management and administration within institutions (Baker, et al., 2019). As with the research in this thesis, I will underpin any future research in the same way, with the ultimate aim to enhance practices, relying on a pragmatic research philosophy and action research cycles.

The final direction for future research is more concerned with staff development than it is with the use of technology. One of the key outputs of the research in this thesis was the digital development programme. The programme was a fundamental aspect of the success of the college in offering high quality education during the pandemic. The need to continue to develop the skills and confidence of staff when using technology is still a priority; however, there is a need for this to form part of a larger programme of development. The research proposed here is specific to my institution once more, and through self-assessment and reflection, a process to build a successful teacher development programme will commence soon. Evidently, teacher development is vital and research continues to show it supports teachers at all levels of experience, and instructional development is just as important, if not more important than content knowledge advancements for enhancing student learning (Hill, et al., 2022). I am very much looking forward to enacting this research, underpinned by pragmatism and action research.

Critical Reflection – My Development as a Researcher in the Field of Education

Studying for this Prof D has been challenging, but nonetheless rewarding at the same time. When critically reflecting on myself as a developing researcher, it has proven valuable in completing my journey as a doctoral level researcher.

The first key aspect to reflect on, and something I would shape differently if I was to conduct the research again, was spending more time from the outset of the research analysing theoretical

frameworks. In some way this was impacted by the changing nature of the thesis at certain points, for example, changing institutional sponsors impacted on the focus on the research, and external factors such as the pandemic also influenced the direction of the thesis. However, this is something I will do differently in the future.

Although I am happy with the literature review chapter (chapter 2), where I focus on many key debates in education, as well as salient debates concerned solely with online provision, I believe that I could have been more critical of the established frameworks in current existence. For example, I do discuss in chapter 2 the Technological Pedagogical Content Knowledge – TPACK framework (Mishra & Koehler, 2006); the Replacement, Amplification and Transformation framework, or RAT (Hughes, 2000; Hughes, et al., 2006); and the Substitution, Augmentation, Modification and Redefinition model, known as SAMR (Puentedura, 2006), and offer some critical analysis of the frameworks in research study one (chapter 4), but as I reflect now, I could have developed this further, and certainly applied the critique in my thought processes for data collection earlier. If I am being truly honest, much of these frameworks were revisited post research study one (chapter 4), and reflecting now I believe there would have been a greater merit in critically analysing these earlier. That said, I believe the holistic theoretical analysis in the literature review was a strength, and bringing in wider debates into the use of technology and online provision benefitted the research questions.

In hindsight, and related to the above is the use of the terms online learning and online delivery throughout. Although I do include a section in the literature review (chapter 2) explaining pertinent terms, and make reference to a new term developed during the pandemic (Hodges, et al., 2020), there was scope for me to internalise those terms in greater detail from my perspective. I believe this may have given greater clarity of thought, and although I don't believe these terms impact at all on data collection, I would have liked to go through the process of critically analysing them from my perspective. However, the reflexive and reflective processes I have now engendered

into my approach to research has been a positive of the Prof D and my development as a doctoral researcher. I believe being able to look back and reflect on aspects that could have been improved is a positive, and below I have incorporated more reflective thought on the terminology used.

My current role, as defined by The Sheffield College identifies me as senior leadership. I am currently the Assistant Principal for Teaching, Learning, Assessment and Innovation. I am a staunch advocate of teachers, their role and what they do, and much of my leadership is to support the teachers in my institution through strong professional development. As I reflect now, and in whatever role I progress to in the future, I will always see myself first and foremost as a teacher, something I am very proud of. In my role now I still teach on the teacher education programmes when I can, I am still active in educational research, and I work very closely in devising and implementing strategies to support teacher professional development. Stepping back to consider the terminology (van Manen, 1991), the use of delivery throughout the thesis is more concerned with the method of modality, i.e., online delivery (Siemens, 2005), as opposed to the role of the teacher. For example, I believe teaching to be an active process even when carried out and completed asynchronously or through flipped methods. Teaching in this context, in an online medium still requires the skills, knowledge and experience of teachers in the planning and implementation of a session or group of sessions. The teacher still has to plan and implement the pedagogy, and a key aspect of this thesis was to enable that to happen more effectively. Reflecting now, I don't consider teaching and delivery the same thing, for example, teachers don't deliver learning in the same way amazon deliver commodities. In my experience, there are times where external bodies and commentators can make education feel like this, but from my perspective, someone who has lived and breathed teaching for 17 years, it is very different.

To conclude on this reflective point, large aspects of the work completed in this thesis was to develop teachers, their planning and application and use of pedagogy applied to online mediums. A great example of this was the design and implementation of the Digital Development Programme.

In achieving this, it permitted the college to subsequently design and implement strategies for online delivery at cross-college levels. The subsequent result was students' learning. Through the research completed that resulted in developing teachers' practice, especially related to online environments, students' learning was not impacted by the pandemic, and the future design of the curriculum post pandemic offered greater flexibility.

Further introspection has highlighted to me I could have been more explicit on the outcomes of the research in terms of the impact of the Digital Development Programme. If I was to complete the research again this is something I would consider in greater depth, both in terms of the mechanism and underpinning rationale.

In setting out to develop successful frameworks for online learning, the literature review (chapter 2) would have benefited from a concluding paragraph explaining what the terminologies mean related to this research. It has been beneficial to go through this process in the above paragraphs. However, further reflection has also highlighted to me that I could have defined, and been more explicit in what the success of the research outputs were, especially the Digital Development Programme. Internally at the college, and discussed in the second iteration of the programme in chapter 5, the reporting sites that were developed were a useful measure of staff engagement in the programme. This was created as an indicator of the success of the developed programme, which was focused on staff. However, the related impacts of students were measured through the outcome data at the college, which was of paramount importance especially with an upcoming Ofsted visit. As highlighted in the section 'The Sheffield College – Impact on Data, Outcomes and Progression' in Chapter 7 – Dissemination, the outcome data continued to improve following the inception of the work completed in this Prof D, a testament to the impact of the research completed. I accept the notion of correlation vs causation but as the most important measure for any FE institution, the improvements to student outcomes emphasise the

improvements to teaching, learning and assessment as a result of the Digital Development Programme.

Thinking aloud (Pinnock, et al., 2015) I did consider other methods for collecting impact but following the inception of the reporting site (see chapter 5) and the use of student outcome data I chose not to do this. Reflecting now, and as a main premise of the research was to develop staff and judge the impact on students, it may have been beneficial to include more student data to supplement the outcome data. Internal data does exist, referred to as 'student voice', and I could have developed this to garner further evidence on the impact of the programme. At the time, my thought process was to keep this to the externally verified published data quoted in the aforementioned dissemination chapter, as this data is the greatest indicator of success for a college. However, and although I am pleased with the amount of data collected in the research studies and the outputs following each study (see table 3), direct student feedback is something I would consider if I was to complete the research again, or, in any future research completed in the sector.

Reflecting on my philosophical and methodological choices, my overarching approach to research, now and in the future will be aligned to pragmatism. As a researcher, what has always been important to my approach, is the knowledge gained from the research and the impact this then has on professional practice. Too often, especially in my field, I have witnessed colleagues and peers distance themselves from research, thinking of it as 'something others do'. I have worked with staff to demystify what constitutes research and the values of being involved in some form of research, but all too often the requirements to balance a perfect methodology with ontology and epistemology (Morgan, 2007) inhibits practitioner research. During my own experiences of research, I have often found myself deliberating more on ontology and epistemology than I have the actual research, something that I now see as counterintuitive. Reflecting now, I have studied many research paradigms and philosophies prior to, and during this Prof D, but I can say with certainty

that it was worth it, as my approach to research now and in the future will be underpinned by pragmatism, and that development is one of the positives of completing this Prof D.

As alluded to above, and due to the nature of being a practitioner researcher in the field, I have always placed the emphasis on the aims of the research, and what this would mean to professional practice. Following this, I have always been thorough on the need for a strong methodology, but the notable point is the aims and outcomes of the research are the driver, not the alignment to a paradigm or methodology. This for me is the beauty of pragmatism, due to allowing more fluidity and fewer boundaries, pragmatism aligns to all well-constructed paradigms to ensure research obtains useful results (Kalolo, 2015). Moreover, one of the key pillars of the philosophy of pragmatism is to find solutions to real world problems (Badley, 2003; Biesta, 2010; Rorty, 1999), which is vital in my field and for my values as a researcher. In summary, pragmatism was imperative to ensure the research carried out within this Prof D had the desired impact, but more than this, it has developed and shaped my approach to future research, and something that I will incorporate personally, but also across the institutions I work at.

However, it is imperative to also acknowledge that although throughout this Prof D I have affirmed my beliefs concerned with research paradigms and philosophies, inevitably these pre-existing beliefs existed in me and influenced how I conducted the research. As I reflect now the ability to stay objective with my beliefs and values established in me from my own previous experiences was challenging. The fact I may have already made assumptions about the research topic and what this means to practice without consciously examining these (Maxwell, 2012) is a limitation, and this applies to all research and researchers. What emphasises my development as a doctoral researcher is firstly knowing this, and secondly acting on it. This enabled me to mitigate where I could throughout all three of the primary research studies, and by incorporating reflexivity into all aspects of the research, I was able to look through a critical lens and remove myself from the process whilst doing this (van Manen, 1991). A good example of this was recognising my

subconscious view of technology and its role in education. I found I had to challenge myself at times, and almost play two roles, one the researcher and two an additional meta-researcher asking questions such as, 'is my belief about EdTech influencing this?' 'how can I be sure that is the case, and it is not simply my bias leading the interpretation?'. This was a valuable learning experience for me as a researcher, and throughout the decisions on research methodologies and methods, data collection and analysis, I developed a process for firstly recognising how my potential values and beliefs could bias my work, and then implemented a process of reflexivity in each of the three research studies to mitigate against this, where I considered personal reflexivity, interpersonal reflexivity, methodological reflexivity and contextual reflexivity (Olmos-Vega, et al., 2022).

Although I am confident that implementing this approach was successful, if I am truly honest in my reflections now, I believe that my alignment to pragmatism was heavily influenced by the sector I work in, and my institutional sponsorship of this Prof D. This may have led to a greater focus on the production of 'something tangible' in the early stages of the Prof D, as opposed to the theoretical underpinnings discussed earlier. I think what is valuable for me now, is that I have recognised that and learnt from it during this Prof D, and developed a greater knowledge of the philosophy of pragmatism, but also through reflexive purposes, how to understand my own positionality in the research process. I did develop that throughout through the reflexivity detailed above, but it is something I am now more aware of as I review the entire thesis.

Like pragmatism, action research was also of paramount importance within the thesis and will be an approach that will shape my future research. Consistent with pragmatism, action research is concerned with understanding and changing practice (Kemmis, 2009), and it helps close the gap between research and practice, which aligns to my values. Throughout this Prof D, action research proved to be an excellent approach for giving a structure and vision from within the methodology to see research as iterative and cyclical, studying real world problems systematically overtime (Mills, 2000). Appreciating that action research is more than a process or spiral (McTaggart, 1994), using

the framework as a heuristic certainly helped focus and consolidate the aims of this thesis, which was a positive and something I will incorporate in my research in the future. A great example of this within the thesis was the initial implementation of the Digital Development Programme following the first primary study, and then subsequent iterations and developments to the programme that happened following further research in the thesis. This simple premise that research to real world problems is ongoing and not finite is significant.

Finally, and something that I developed throughout this Prof D is the need to consider my role within the research itself, and this is prominent within action research due to the collaborative nature of the methodology (Kemmis & McTaggart, 1988; Lingard, et al., 2008). This final point is a positive of action research when compared with other methodologies, and something I liked about it when reviewing a range of methodologies, however, it was something I had to explicitly consider throughout the research, especially in consideration of the relationships that existed in the research setting and the influence of this. This aligns to interpersonal reflexivity (Olmos-Vega, et al., 2022). Within research study two (chapter 5) this was prominent in my reflections (van Manen, 1991), and I had to review my ideas, use my meta-researcher to reflect on the power dynamics of conducting focus groups with participants I had a relationship with. It was important for me to give the space for the participants in the focus groups to feel free and give their genuine thoughts and viewpoints. I utilised some strategies to help, for example, making this explicit when explaining the research and information sheet. As I reflect now, I am confident that this power dynamic did not impact on the data obtained during the focus groups, but from my perspective it was another valuable episode in my development, and once again my ability to view the research from a different perspective was pivotal. It also reaffirms to me that I chose the correct methodology, as I critically assessed a range prior to selecting action research, and I found focusing on the limitations as important as the strengths when making my final choices.

Reflexivity was also imperative within this thesis and I will continue to utilise this along with pragmatism and action research in my research endeavours in the future. Unlike the aforementioned, I had not encountered reflexivity in great detail prior to this Prof D, but as I reflect now, it was such an important component of the research that I completed. The impact was twofold; firstly, to improve the trustworthiness of the research, and secondly through the process of constant critique, appraisal and evaluation required when embedding reflexivity into the process (Olmos-Vega, et al., 2022), it helped with my own reflections and subsequent developments as a researcher. It is also valuable in making the underpinning decisions and choices throughout the thesis explicit to the reader. Working closely with my research team the embedding of reflexivity was of paramount importance, for example, in study one from a personal reflexivity perspective, when acknowledging that I was carrying out the research from an intrinsic position of being positive about technology. Fundamental to study two was interpersonal reflexivity, in recognising in advance the relationships I had with the participants had the potential to influence the data obtained if not considered. Finally, within study three, methodological reflexivity was important when planning the process of member checking (Creswell, 2005; Lincoln & Guba, 1986) and member reflections (Braun & Clarke, 2013), firstly following transcription and secondly thematic analysis. Ensuring that my admiration for the expert I had interviewed did not influence the data collected.

The embedding of reflexivity was important within this thesis as it is acknowledged that subjectivity plays a part in qualitative research (Rees, 2020). The use of reflective writing and collaborative reflection (Olmos-Vega, et al., 2022) proved crucial, and I will employ these methods in future research when embedding reflexivity. As it is an approach that supports the acknowledgement and control of potential biases that could influence the findings from any research. As discussed earlier, a good example of the use of reflexivity was in the identification of the potential bias from my hidden and somewhat subconscious views (Maxwell, 2012) regarding the use of technology in education. By being reflexive, and making this explicit to myself as the researcher, I put in place strategies to mitigate any bias influencing the research. As can be seen

throughout the thesis, I kept a diary of research notes, so I could then question myself in almost a third person manner, to be confident no bias was evident. In research study two for example, I would utilise this approach to firstly check the questions for the focus group were exploratory but not leading, and during analysis I would constantly check and re-check how I had interpreted the data.

The theory generating expert interview method employed in study three was also a great learning curve for me as a researcher, as it was the first time I had implemented such an approach. I have previously gained experience with a range of interview approaches, for example, during my M Ed and other published research²⁵, but I had to complete much reading, study and research on the best way to interview an expert, quickly establishing that this was indeed a completely different method to other interview variations. Knowing that I wanted to interview an expert for one of my primary studies, it focused me to complete the aforementioned learning on expert interviews, finally settling on the systematising expert interview typology (Bogner & Menz, 2009). To ensure that I implemented the method correctly, I practiced many of the nuances in advance, and in combination with reflexivity, I was prepared very well to not only implement the interview process professionally and effectively, but also ensure that my own admiration and potential bias for the expert did not impact on the data collection. This method was certainly very useful, and within the programme of research, had the purpose I had hoped and planned for, and it has certainly added another string to my research bow, broadening my data collection methods further. Certainly, in my field, especially related to the innovation and technological aspects of my role, the need to interview experts in the future may be a requirement, and I now have the knowledge and experience of being confident and competent in completing such interviews.

²⁵ A published article from 2016 is available here:
<https://www.tandfonline.com/doi/abs/10.1080/13596748.2018.1444391>

Accompanying the macro impacts detailed above, micro impacts will also shape my future endeavours with research. Firstly, the use of online videoing conferencing brings a new dimension when collecting data through interviews or focus groups. The speed of improvement to a range of these tools such as Google Meet, Zoom and Microsoft Teams has been rapid, and at the time of writing not only do all the aforementioned products enable quick and easy recordings that save automatically, they now offer transcription. These developments offer great improvements to the research process, firstly making it much easier to conduct interviews or focus groups with participants not restricted by their location. Secondly, the qualitative approaches to analysis are time consuming, and the transcription option would be of great use in the initial coding. Utilising these tools will certainly be something I consider in future research. In addition, the use of pilots, consent and information forms, and interview guides have also proven useful and will be incorporated into future research.

Throughout the Prof D I have also developed a much deeper knowledge and understanding of the qualitative approach, advancing beyond my starting point where I thought I had a good knowledge of qualitative research following the completion of my M Ed. I now appreciate the benefits of qualitative research and am less concerned with the generalisability (Bryman, 2016; Cohen, et al., 2017; Yin, 2011) of it. Moreover, through the reading I have completed and experience gained throughout the Prof D, I am now much more confident and adept in acknowledging limitations in research, and utilising strategies to mitigate against these to enhance the trustworthiness of qualitative research. This includes the use of member checking (Creswell, 2005; Lincoln & Guba, 1986) and member reflections (Braun & Clarke, 2013); within data analysis, specifically in the operationalisation of focus groups and subsequent thematic analysis; and the use of reflexivity throughout all stages of the research process, utilising reflective writing and collaborative reflection (Olmos-Vega, et al., 2022) as detailed throughout.

To conclude, my journey through this Prof D has resulted in me developing as a researcher, and this growth will underpin institutional initiatives and strategies in my future endeavours and working practices. During this Prof D, I was promoted to a Principal position, with greater strategic autonomy. I now know that my foundational pillars defined and shaped through this Prof D will influence the policies and processes I put in place in the future regarding research at an institutional level.

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Appendices

Appendices

Appendix 1 – Change to questionnaire following pilot

The most difficult aspect of moving to remote delivery has been? (tick all that apply) *

- Not all students have access to a device or WiFi
- My own digital skills and experience
- The digital skills and experience of the students
- Student engagement
- Getting students logged onto the virtual learning environment (VLE)
- Other...

Appendix 2 – Focus Group Guide

Introduction

The purpose of this study is to explore what constitutes effective online instruction.

Prior to the focus group:

- Can I check that you have signed the consent form, please?
- Do you agree to being recorded?
- Participation in this focus group is voluntary, you can choose not to answer any question you wish and you can end it at any time.
- All information gathered will be kept anonymous and any quotations used will not contain any identifying information.

Interview for Staff (online experts):

Reason	Questions (staff)	Probe	Prompt
Ascertain and explore what makes up effective (quality) online TLA.	What does effective online teaching, learning and assessment look like?	<ul style="list-style-type: none"> • Commonalties in strong progress sessions • Commonalties in slower progress sessions 	<p>What has been the biggest common denominator in the strong sessions (if that is possible)?</p> <p>What is the main issue(s) where progress is not as good?</p>
	Comparing online delivery against face-to-face what are your thoughts?	<ul style="list-style-type: none"> • Is there anything that online is actually better at • Is there anything that online can't replicate (does it need to?) • Can the evidence gathered from effective instruction be applied in an online environment? 	Tell me about the best/worst things about it from you experience?

		<ul style="list-style-type: none"> • Rosenshine's Principles? • Assessment? (all forms) 	
	How do we develop online TLA in the future through developing staff?	<ul style="list-style-type: none"> • What has supported staff development • The role of coaching • What hinders • Are there any particular barriers to developing the skills of staff? 	<p>Share any ideas/stories where staff have/haven't develop?</p> <p>Reluctant staff?</p>
	What are the greatest opportunities for online learning/delivery?	<ul style="list-style-type: none"> • Why • How 	Do you think these will happen now, or take time? Why?
	What are the greatest barriers for online learning/delivery?	<ul style="list-style-type: none"> • Why • How 	Do you think these will happen now, or take time? Why?
Wrap Up			

Appendix 3 – Change to the Teaching, Learning and Assessment Improvement Policy

(Please note, only the pertinent elements have been included here due to the length of the full policy. In addition, the policy has been left in its original font.)



**The
Sheffield
College**

Teaching, Learning and Assessment Improvement Policy and Documents

Owning Strategy:

Teaching and Learning Improvement Strategy

Linked Strategies:

Curriculum Design Strategy
Higher Level Skills Strategy

Relevant to:

All delivery staff, Assistant Principals, Vice Principal; Heads of Academy, Head of Apprenticeships, Teaching, Learning Innovator, Teaching and Learning Coaches, Head of Cross College Quality Learning, Teaching and Assessment and HR Business Partners.

Office Use only:

Policy/Procedure No.	Approval Board/Committee/Group:	Approval/Re-approval Date:	Implementation Date:	Next Review Date:
CQPO11	Teaching, Learning, Quality and Student Experience Committee (TLQ&SE)	August 2018	August 2018	July 2020

New Policy or Substantive Policy Review

Version	Date	Policy Development Agreed by	Policy Development Author	Draft Policy Verified by	Policy Approval	Impact Assessment (if applicable)
V2	August 2018	Executive Board	Deputy Chief Executive – Curriculum, Quality & Assessment	T&L Strategy Group	Executive Board	

Rationale for new or substantive policy review

TLA remains an area for improvement and this revised policy reflects the College's new structure and implementation of supportive developmental observations and learning visits. The policy introduces the concept of the 'Teacher on a Page' scorecard to support a holistic view of teacher performance rather than the reliance on one observed session.

Please make explicit if change/review relates to procedures, guidelines and associated documents only

Periodic Policy Review / Change History

Version	Date of Review / Revision	Description of Change	Reviewed By	Approved By
	August 2019	Flow chart updated, amendment to feedback timing and links to HR business partner	LW	AS
	September 2020	On page 3 the definition of Learning Walks has now been changed to Learning Visits to encompass online learning visits as well onsite learning visits.	SS	AS
	September 2020	On page 3 Online reviews has been added as a new process to support staff in their online delivery in light of COVID – 19 & explained on page 7.	SS	AS
	September 2020	On page 4, section 3 – Principles, Learning Walks has been changed to Learning Visits as above.	SS	AS
	September 2020	On page 5, within the Responsibilities section under Teaching and Learning Innovator, Heads of QTLA and Learning and Development Coaches a small addition 'and other organised developmental opportunities' has been added to represent wider developmental opportunities that are new to the sector and the College.	SS	AS
	September 2020	On page 6, section 6 – Learning Observation the term Formal Observation has been used throughout to	SS	AS

		denote any observation that will result in feedback and a BRAG rating and distinguish from Learning Visit.		
	September 2020	On page 7, within section 7 – Learning Visits, clarification is given on the process and procedure for learning visits with links to the appendix for themes.	SS	AS
	September 2020	On page 8, within section 8 – Procedure for Learning Observations a link to the Google VLE is now made in bullet point two, and clarity on observers visiting a session for smaller pockets of time to see different aspects to a lesson in bullet point three.	SS	AS
	September 2020	On page 10, within the Feedback to Faculties section a small addition is made regarding the content of the health check received following the observation process.	SS	AS

Definitions

Lesson observation is a process of critically evaluating the quality of delivery of a student’s learning experience. An observation is of a given duration and will result in a report and evaluative discussion between the observer and the teacher.

Delivery staff means individuals delivering or supporting any form of learning activity.

Learning visits are short unannounced visits, usually of a thematic nature and usually 10-15 minutes in duration. They will be carried out on all forms of delivery.

Online reviews are extended visits to online sessions to support and develop practice. These reviews will result in a developmental report to support staff but are not rated on a BRAG scale.

Support Plan is a plan used when performance concerns have been identified.

Improvement Action Plan is used with an individual where previous performance concerns have been raised and addressed through a Support Plan but an improvement has not been made or the improvement has been insufficient.

‘Teacher on a Page’ Scorecard is a scorecard that details key performance indicators using a wide range of evidence to make a judgement on the overall performance of a teacher.

Online Reviews Amplification:

- Online reviews will be implemented outside of the formal observation process during face-to-face online delivery (see Appendix 2 for the delivery models for the academic year 2020-21) and support and develop online pedagogy. These reviews will not be rated on the BRAG scale and are supportive and developmental in nature. Where there is a need to improve online delivery quickly a supportive coaching plan will be implemented and carried out by an LDC.

Appendix 4 – Interview Transcription

Professor Paul A Kirschner Transcript

The first part of the discussion focused on face-to-face delivery in comparison to online delivery, further exploring the findings from the focus groups in the previous study.

Interviewer: Can we simply take a session that was a really effective face-to-face lesson and delivery it online and expect to get the same results.

Professor Kirschner: Short answer, no.

Interviewer: Why would that be in your expert opinion?

Professor Kirschner: You said that it was really effective in face-to-face so I assume that the person making the lesson made use of the tools and techniques in modalities that surely she or he had at his or her disposal in an effective and efficient and enjoyable way. Once one moves from one mode of teaching to another or one modality of teaching to another, one must first evaluate whether or not the tools and techniques that were used in the first modality are also effective and efficient for the new modality, and if you don't do that, if you just transpose the one to the other then you're not making effective use of the modalities that you have. It's just that simple, I mean I can get into things like when you're in a classroom you can see the five, ten, fifteen or even 30 or 600 students in front of you and you can see whether or not they understand what you're saying or what you mean. In an online environment that is often not possible, not the case. You can't in one view see all your students, often they have their cameras out so you don't see them at all. So that just makes a difference in how you react, the interaction between you and your students. I can go on and on about it but all of the different aspects and when you're busy for 40-45 minutes you can keep people in a face-to-face environment fairly engaged in what you are doing. In an online environment 40 or 45 minutes watching or listening to a talking head is just completely different. You might want to change that into two or three 15 or 20-minute sessions instead of one long session. Now you can do it for all the different aspects of good pedagogically set up lesson. You could look at what you did and what you were trying to achieve in your face-to-face lesson and then analyse it and come to a conclusion of how that could be done in the new online or I'd more call it making use of other media or modalities to try to achieve what you want to do.

Interviewer: So, the online teaching then, just on that final point, requires a different thought process?

Professor Kirschner: As a teacher you have to think through from what do I want to achieve. What do I want the students to be able to achieve? What do the different modalities that I have allow? How can I best implement them? And you do the same thing as I would conceive of a good teacher doing in a face-to-face environment and saying I'm with my students in the class in the classroom, how can I best achieve my goals knowing that I'm standing there, and do the same thing for the online environment. I prefer to call it making use of other media and modalities.

Interviewer: Is it fair to say Paul on that, obviously you're thinking about what you want your students to learn etc., but when you are using these different modalities, for example online, that it is very much a different pedagogical approach?

Professor Kirschner: It's hard to say. You're pedagogy might be the same but the way you implement it in the online environment is different. You could say with your pedagogy you want to

begin your lesson with referring to the prior knowledge that was necessary. That's your pedagogy. If I'm in the classroom I can ask everyone to try to do something with the equation that we had yesterday, I don't know if we're talking about university-level or high school level or elementary level, it doesn't matter, with that thing they did yesterday and ask them to just hold up a whiteboard and show it to me and I can see in the whole class whether or not the students have done it. Now, I want to use that same pedagogy in the online environment but I can't ask them to hold up the whiteboard because in those little boxes and I see on my screen of my 25 students I won't be able to read what's on that so I might want to use something else. I might want them to use their telephone and make use of some type of quiz or quizlet and do it on that. Now, the pedagogy is basically the same, making use of a retrieval quiz at the beginning of the lesson to see whether or not the relevant prior knowledge is available and if not then to go into it myself and review it for them. I'm just being very simple, very banal about that, but the way I do it is completely different, but I'm using the same pedagogical techniques. So it's kind of hard, certain pedagogical techniques can either be achieved more easily through different modalities, and some possibly not at all.

At this point, the interviewer explained to Professor Kirschner that the subsequent questions would be moving to a different theme, linking to concepts Professor Kirschner had discussed in recent papers and podcast interviews regarding evidence based practice and the science of how we learn in relation to online delivery.

Interviewer: Are there still guiding principles, that are key when teaching or delivering online that must be included for long term learning to occur, for example, assessment, retrieval practice etc?

Professor Kirschner: Everything. The cognitive architecture of the learning and of the learner hasn't changed because we've changed modalities. So they have a sensory memory, a working memory and long-term memory. All of the aspects that relate to that, cognitive load, dual coding, elaboration theory, desirable difficulties, all of those things pertain to learning in whatever modality you're talking about. So that kind of makes it different, I mean it leaves it the same, we process the information and learn in the same way, it just means that if I want to achieve that in my teaching I might have to do other things. If I want my students to take notes by hand and not with a keyboard in a class situation I can just say close your laptops. This is kind of hard in online environments, so you have to figure out how am I now going to make sure that they process the information while they're hearing it, because I want them to process it. I want them to summarise what I'm saying as opposed to just typing it verbatim what they hear because students nowadays can type as quickly as I can talk. If I require them to take notes with a with pen and paper then I'm requiring them also to process the information while they're hearing me speak about it; most students can't write with pen or pencil as fast as they can type requiring paraphrasing, summarizing, etc. I would be hard pressed to do that in an online environment because they have their computers open and I can't tell them to close it otherwise they can't hear my lecture. So I have to think about how am I going to stimulate processing information processing when I can't control that part of the information processing process.

The interviewer, following a short overview then progresses to the following related questions.

Interviewer: How does online teaching fit into the debate about direct vs constructivist or discovery learning?

Professor Kirschner: From my experience and also from experience of students and some research projects the students in online environments, as we had this last year and half with Covid-19, actually need more structure instead of less structure because as a teacher you don't have the

intensive personal contact that you normally have with the student where you can see whether or not a student is understanding what's going on. So while some people have said well now they were online let's make use of this crisis and do more discovery learning they are actually doing the exact opposite of what they should be doing because they should be actually providing the students with more structure because the student isn't in the classroom, the student isn't going to school. The student has a problem with directing her or his own learning process, with making the time that's necessary to do what she or he has to do. With concentrating on that which is necessary which you can control very, very easily within the contact situation, but which you can't do in the online situation. So even going back to what we did in The Open University of the Netherlands in any event, but also in the British university 30 years ago, the materials were very, very guided. They provided the pedagogy that was necessary for someone who was not in a classroom or in a face-to-face environment knowing that person was studying at all different times of the day and night that you weren't there to see and help them when it was necessary. We chose for very, very structured learning and that's still the case. The less physically available you are the more the necessity of structuring it well to help the students because most of them aren't capable of self-directing and self-regulating their own learning and they've said that. Research here in the Netherlands, students were just dying, I'm talking about high school students but also university students, to be back in the classroom so that there was a teacher there to structure and regulate, help them regulate their learning because they couldn't do it. So it's self evident.

Interviewer: Is there also a link to where students are on the expertise continuum, about what we might do with them in an online environment (novice vs expert)?

Professor Kirschner: You do the same thing in the online environment as in the face-to-face environment. First of all most students although they may be a little bit farther along, some of them, if we are talking in the normal way then they might have a little bit more knowledge but they are still very far from being an expert. If they were experts they probably wouldn't be students. They might be good students, expert students, which means they have learnt how to study properly, so they themselves space their practice, and they themselves interleave, they make use of Cornell notes. Of all of those types of things but it doesn't give them more expertise in the area that you're teaching. Often they might be one or two lessons ahead of the other students but that really doesn't make them experts. So that's just number one that's more caveat here in the whole discussion. The second, normally in a face-to-face environment what you'll do is you'll see whether or not you have to begin with the basics or you can conceive that they already have it and give a little bit more freedom to learn if you know they already have the prior knowledge you don't have to go into it in the same way. If you see that they can already can solve a problem and go through the proper steps you no longer might have to use worked examples in that you might want to choose for process worksheets or something which is also in a normal face-to-face environment. The whole idea of the, the whole world changes once we go over from face-to-face and online and now we need to teach differently and we can go to the difference between the pedagogy the use of the media. Yes the use of the media changes but the pedagogy and the principles you use based upon good educational psychological research and psychological research are still the same basic principles. The cognitive theory of multimedia learning, I use that in the classroom, means that I don't I don't read my slides and in an online environment that means I shouldn't annotate my lecture so they have to listen and at the same time - in closed caption - read what I'm saying because they've also asking them to semantically decode the exact same information in two different modalities which is a strain on their working memory, and which means that they will learn less well because of the redundancy principal. The redundancy principle exists in both my face to face and my online environment, but it means the redundancy can occur in a different way because I don't put closed captioning under

what I'm doing in a classroom but I do read my slides which is similar to closed captioning. It might be even worse in an online environment because you close caption it, they hear you and they are also seeing the slides so they are getting it in three different ways, three different parts. You have to be even more aware of the modality principle or the redundancy principle, or spatial contiguity in that way. I mean, if I'm giving a presentation, you have something called temporal contiguity, that's the things are close to each other in time, and the worst thing you can do is present a slide six and by slide 22 refer to that slide because you are 15-minutes further. So what you need to do is you need to refer to it if you have to repeat that slide as slide 22 and the slide that needs that slide as slide 23 so that it's temporally close to what you are doing. Now you have to do that online or face-to-face, it doesn't make that much of a difference, in principle. It's not a whole new ball game. All of the aspects of what you want to achieve, what you want the students to achieve, the cognitive theories, the models are all the same. The only thing is you're using a different modality to do it and that means you have to understand your modality and how that interacts with the model or the theory that's behind your pedagogy but that doesn't change the ball game. It doesn't make football into rugby.

Interviewer: How does self-regulation fit into the way we are trying to delivery online, and how can we get it right and wrong?

Professor Kirschner: You can get it wrong by assuming it exists. That's the major mistake and teachers at all levels have this assumption that students can self-regulate their own learning which they usually can't. So it exists in both situations. The problem with online learning is that you're not there often in real time to help regulate that learning. In the classroom, if they are then busy carrying out a task, you can walk around the room as a professor or teaching assistant or whatever and see what the students are doing, and can help regulate the process. But in the online situation that's almost impossible because you can't see what 15 or 20 students are doing, you can't see what's happening, you only can see that they're busy but not what they're doing. So that means the chance that you might not be able to regulate those students properly is much larger in the online environment than it is in the face-to-face because you're physically there to help with the regulation. But you can't assume that everybody is as bad at self-regulating as the other. You can also see that much better in real time in the face-to-face environment whereas you realise that afterwards in the online environment when you see that the person hasn't been able to get the thing (work) done on time or handed in on time or choose the proper approach or whatever. So it's much more important in the online environment to assume until proven otherwise that students can't self-regulate and try to teach them how to do it because self-regulation is not something that comes easily or comes magically. While students are often very much capable of self-regulating all that they have to do in order to go to a party on Saturday night, when put in a learning situation they aren't that good in that and also in portioning their time. Let's say you go over to an online environment and as I said you shouldn't spend 45 minutes lecturing or something you might choose 15-minutes of lecturing and then 30-minutes of, ok working on their own and we'll see you tomorrow what happened. But then you're assuming that those students are capable of at that point in time stopping with your lecture or whatever it is you're doing and will then begin on the work that you expected them to do, which you've set up in a certain way because you've chosen for certain pedagogy and they do it the next morning 15 minutes before the next lecture starts, for example. So you don't have that control over the situation in which you can help them regulate their learning, and at a certain point in time give them more freedom. In the online environment it's just harder to do that, not impossible, just harder.

The interviewer then informs Professor Kirschner that the next few questions are more based around the potential opportunities that aspects of online learning could offer institutions.

Interviewer: Should we be thinking about utilising online delivery in a different way?

Paul Kirschner: If I'm working in a kitchen and depending on what I want to do, I can use a vegetable knife or a knife to fillet or to debone something and of course I can use each knife for the other purpose but that's not very good. It's the idea of what do I want to achieve and that's always the guiding principle. It might be the case although I haven't studied, it might be the case that certain, the freedom of online teaching and learning allows you to supplement what you're doing in a meaningful way. The availability of online open educational resources and things like that. You might, the teacher might tend to use that more in the online environment than she or he does in the normal face-to-face environment because they're dealing with a book and you're making use of the book and you might go online if you're teaching physics to find a good simulation of lenses concave, convex, the combination of those and things like that, but in online environment you might more easily choose to not give that lecture about concave and convex lenses and make use of something that was made in the open courseware initiative for MIT, where I assume the professor in physics at MIT is better than most physics professors at whatever college you can think of. You can then assign that and then make use of that, in you could say a flipped way in your own classroom. When you're with the students online to discuss it, you might more easily choose to do that is what I'm saying because you can just as easily do it in your normal face-to-face and assign them the tasks of looking at this video of a professor, or finding for themselves a good video explaining convex and concave lenses and then in the classroom work on a number of tasks with them alone on that. The chance is possibly greater if you did that in your normal environment that it might not work (face-to-face). You might be more prone to do it in this online because you think we're already online then I won't give that lecture I will devote my time to something else, whereas in the face-to-face you might begin with explaining concave and convex and I'll put up a demonstration and show it and have everybody gather around me. So it has its nice things as you interact in a different way with them. Everything has its positive and negative sides to it but you might be more apt in the online environment to do those types of things but it's not necessary. It doesn't necessarily lead to better teaching or you could possibly say maybe in your face-to-face environment you should make more use of open educational resources, open courseware than that you normally do. You're a teacher and part of your job is information transmission but a library can also transmit information. Maybe your job should be to, more to work with the students with that which has been transmitted. But it is also dependent on what level, if you're talking about a first year university student you wouldn't do that. With a fourth year senior you would be more prone to doing that, and that's why even at the Dutch Open University we had a different model for first level than second level than third level. You got the first level called learning units where everything was built in, including the information. At the second level we called it textbook-workbook, in which we choose a textbook instead of writing our own good didactic material, pedagogical material, and gave them a workbook which would take the place of the teacher. The third level we called workbook-source materials in which the basis was no longer in the textbook with the information but the workbook and they themselves had to find the proper source materials to do the things that were in the workbook. So we changed it around. So you could say at the first level it was completely directed externally and we made use of a transmission model with all of the structure built into it. The second we made use of specific learning materials, the textbook, but we incorporated the pedagogy into something else as we assumed they could integrate the two with each other after having done the first level courses, and the third one we said we are not even going to give you the source materials, the textbook, you have to find them yourself because you are far enough. You should be good enough to deal with this task in the

workbook, to find the proper source materials to be able to carry out the task or solve a problem or whatever because you have the basic knowledge and you know how to carry out tasks, now we're not going to spoon feed to you in anyway at all, find it yourself. Now, it's the same thing if we are talking about what was face-to-face and now possibly increasingly online, is that depending on your student population you choose the proper level of structure, amount of structure and for your teaching. And it doesn't mean at the third level we're leaving it to them to just self-direct their own learning, no, we're giving them the tasks that we know, going back to *The Ten Steps* (Ten Steps is a book by Kirschner and van Merriënboer), the tasks that we know will show whether or not if they can carry out or whether they've learnt what they should learn. So we still give them the tasks, and we do that in the task classes in *The Ten Steps*. The only thing is that as the students become more advanced we remove a certain amount of the scaffolding, and some of the scaffolding here is giving them the information materials instead of having them find it themselves, but we still give them the tasks they have to carry out and the criteria that we'll be using to see whether or not they have carried out the task correctly.

Interviewer: Can the use of online approaches offer opportunities to develop long-term knowledge through deliberate practice?

Paul Kirschner: People really don't understand what deliberate practice is. Deliberate, it sounds so simple, you practise with a reason, deliberately you do it. People think that you can create the deliberate practice but this is something that comes from the person her or himself. If you go to your football training and you deliberately, in the familiar sense of the word, the non-specific sense of the word, deliberately practice your free kicks, so now we go over to this part and they put up that row of defenders in front, or maybe they are real defenders and you practice, and you say I'm doing expressly, so I'm doing it deliberately. That's not deliberate practice. Deliberate practice is when the football training is finished, you then take out that row of defenders, and after the coach has gone and whatever. Or while the coaches or trainers do something else, you spend an extra 15 to 30 minutes everyday practicing those free kicks, because you want to become an expert in it. You want to be able to 'bend it like Beckham'. That's deliberate practice. Deliberate practice is something that the pianist hasn't been told to practice but does it her or himself, and if you look at that in terms of goal orientation theory, you would say deliberate practice is primarily carried out by those students that are mastery oriented or mastery approach oriented. They are doing something because they want to be good in it, and so they walk that extra mile to become good in it. Do things above and beyond, choose the more difficult task to challenge her or himself. Whereas most students in most subjects in my opinion, I haven't studied that, are more achievement orientated. Their goal is to get a good mark, and that's it. Now if you're goal is only to get a good mark you'll do that which is necessary. You'll practice, you'll study as much as you think you need to get that mark or grade you want to get. Whereas a student with a mastery approach and especially when we're talking about not an avoidance but an approach; so as a mastery goal orientation approach, mastery approach as opposed to mastery avoidance, they will be that person who makes use of deliberate practice. But in Barak Rosenshine's terminology, it's not deliberate practice, it's just in the first it's very guided because you need things like worked out examples and partially worked out examples, that's the guidance, and at a certain point in time you have to be let free just to do it without that. Whereas the teacher is still standing there and seeing where the students are having problems, but you're giving them practise assuming or knowing, because another thing is try to achieve mastery, another is constantly asking questions. So you've done all of that and you have this idea that a student is capable of carrying out the task un-guided by you, and then you let them do it there and let them show that they can and try it for themselves but you're there watching to see whether or not they end up going in the completely wrong direction.

The interviewer asks a further question related to practise.

Interviewer: Do developed approaches and ability to use online aspects allow that aspect, that principle of allowing the student to practice independently?

Paul Kirschner: Yes it does but it doesn't very easily allow you to look over their shoulders. In *The Ten Steps* which you've read we have the assistant looking over your shoulder - Aloys, and in a face-to-face situation you have that. You know if they are making use of a simulation what their screen should look like if they're doing it well, and you let them do it alone, but you walk around the class and you all of a sudden that Steve's screen is somewhere it shouldn't be, and at that point in time you can intervene. In an online situation that's really hard as with 25 students. I don't know how I can look at 25 screens at the same time on my monitor. There you need an intelligent system and a dashboard that will let me know that 18 of the 22 are doing it OK and only badly 3 or 4, but then you're asking the system to monitor what the student is doing - a 'privacy' problem, and also be able to interpret the way the screen looks and give you a clue that 'Hey, I think you need to go to Steve because he's now in the yellow zone and the needle might be going towards the red'. But the other 18 you don't need to do anything because it's going well and I can see that when I'm walking around the classroom and I just look around and I can see what they are doing on paper, on their screens or whatever. I can see that and can see who those four students (who are struggling) are but in online environment I can't do that. It's the same with online collaborative learning. If you have five groups of students sitting in different places in the classroom I can immediately see which group needs my help and which one doesn't. In an online environment I don't know how I would monitor the chats of five different groups to see whether or not there was an emotional disturbance in it where all of a sudden the students weren't working effectively with each other. That's why we're trying to build dashboards for collaborative learning situations which will give us the information. If I look at it and I say OK that's going well and I see the needle pointing to the yellow going towards the red in that group because my system can analyse their chats or they're talking or whatever, then I know that I have to go there. I don't know how I would do that in five or six collaborative learning teams in an online environment. I would have to constantly jump from one to the other and try to see what's going on, and they are also online with each other and communicating with each other in a different way than if they were in face-to-face and that makes it really, really hard.

The interviewer then refers to two pieces of research by Professor Kirschner on the subject of collaborative learning in online environments prior to asking the next set of questions.

Interviewer: How important is collaboration, and does more attention need to be paid to the social aspects during online delivery?

Paul Kirschner: It needs to be done in all situations, it's just that simple. I mean the last piece of research that I did with Jimmy Zambrano, John Sweller and my daughter Femke Kirschner, that was in a face-to-face situation and we found that familiarity was very important and also having worked with each other on an analogous problem, so that they know each other, not only socially but each other's work habits, and when you have to help or intervene, is this a person who works hard, whatever, those types of things. We found even in the face-to-face environment it's really important and we've known that for years because we don't put a group of firefighters together and say OK you're a functioning firefighting team. We first put them in a number of simulated environments in which they can work with each other and see how and when they have to cover each other's back, and how, what the little idiosyncrasies of the different people are. They have to socially interact with each other, so it's the same if I'm talking about collaborative learning in a in a face-to-face as in online environment. In both of them you need to have the team, the idea from Tuckman and Jenson

from going through different stages of forming, storming, norming, performing and then adjourning. That's the same in both of the environments, it doesn't change and those aspects have a very important social aspect because the norming is completely social.

Following some dialogue between the interviewer and Professor Kirschner, he added:

The problem with collaborative learning, computer supported or not, well there are a lot of problems but the two major problems that I'd name are assuming a group can work as a team; and two, most teachers aren't capable, or don't think about, or both; the necessity of creating a task that's complex enough to require working in a team. Where the transaction costs of collaboration, of communicating and coordinating behaviours with each other, is not higher than the benefits of working together. If the costs exceed the benefits people will not work together with each other, it's that simple. You know it yourself. If you think it's going to cost me more time and more work to do this with someone else then I'd prefer to do it alone and you only want to work with others when working with others makes the load less, makes the end product better, those types of things. Most teachers don't think about that. They give a task that they'd normally give to an individual student and they give them to a team, but if it was already fit for an individual student then it's definitely not the complexity that you need for the team. It's just that simple, otherwise you would never have given it to the individual student because it would have been too frustrating and they would have never been able to carry out the tasks. So you have to re-think the tasks you are given if you're working in a collaborative setting, independent of whether it's online or not, that doesn't matter.

To conclude the discussions on this theme, the following salient points were raised in one long piece of dialogue:

Certain environments are more conducive to that social aspect...

...those are the things (social discourse) you do in a normal classroom but you don't find that at the beginning of most online lessons. Which means although you can do it, that means as a teacher or as an instructor you have to build that into the schedule to have that happen, and you have to do that explicitly whereas it happens implicitly in a normal face-to-face environment, and that's really important if you want people to work with each other.

...that social aspect is really important and you can't take it for granted that in the online environment it will develop in the same way as it does in the face-to-face environment.

The final question progressed to the development of teachers' online practices.

Interviewer: Do you have any views on how best we can develop the skills of teachers, so they are confident of using technology when and if needed, to support and enhance the programmes they offer?

Paul Kirschner: Yeah that's really, really hard because they'd have to know both, at a conceptual level and at the skills level what different technologies can do, and I'm not talking about physically making an animation or something you can let someone else do that; just designing what type of animation or whatever. You have to have a deep conceptual knowledge and understanding of the tools of the trade, and you hope - although it's not always the case - that in the face-to-face setting at the teacher training colleges that they've gone to they've gotten that training in the basic pedagogy, which often isn't case. I mean our studies of textbooks and syllabi used a teacher training colleges in the Netherlands and Flanders (Belgium) shows us that spaced practice and retrieval practice is not a part of most curricula for teachers at teacher training colleges. While learning pyramids and learning styles are. So if we take the optimal situation, and that's the teachers are

really three-star top-chef teachers in their normal way of doing it, then in any event understand the different cognitive psychological models, theories, with how you achieve good instruction. Then the only thing you need to do is acquaint them with how that can be achieved, that which they normally do well in a non-face-to-face environment. So if I was going to give a course in it for teachers, the first thing I would do is acquaint them with Dick (Richard) Clark's work on it's the message, the pedagogy not the medium. The (Richard) Clark (Robert) Kozma debate. I'd acquaint them with the first, the second and now the third handbook of multimedia learning from Rich Mayer; it's coming out soon. In the first one he had five mistakes, in the second one ten, and now the newest one fifteen, with Dave Feldon and someone else. I'd acquaint them with that. With kind of like the fallacies relating to making use of media. Then I'd follow that up with what media can achieve but based upon their already good teaching practices. So, if their normal way is to start every lesson with a short retrieval practice session; as Barak Rosenshine would say step one. If they normally do that then I would concentrate on a community of practice or group CPD or whatever you want to call it, a teacher learning group. I would then acquaint them with, ok, what are the different tools that you have to do it. So you're leaving them in their comfort zone, this is what I normally do and do well but I don't know how I should do that in my online environment. So they don't have the feeling, I have to do it completely differently; no, you have to do the same thing but possibly with a different tool. This is how you do it with the tool. These are the five or six different quiz programs you can use and with this one you can get open answers, and in this one you can use that, and in another one you can do this. Oh, and have you ever thought about sending them a WhatsApp 15 minutes before the lesson begins and requiring them to fill that in otherwise they can't access the online environment so that you know they have done it. Then you can see immediately what you've done. These are the different tools that you have to implement the techniques that you already use. So always talk about tools, but also pedagogical techniques.

Following a brief conversation between the interviewer and Professor Kirschner, the latter finished the interview with the following:

Paul Kirschner: It's kind of like a more stage rocket. The first is, what's the content, what do you need them to learn and what you want them to learn. The second is and what is the pedagogy that I used to do it, and the third is which tools do I use seeing the situation, to achieve that pedagogy. I don't know if could always assume that stage one and stage two have already fired and just go into stage three

Appendix 5 – Expert Interview Guide

Introduction

The purpose of this study is to explore what constitutes effective online instruction.

Prior to the interview:

- Can I check that you have signed the consent form, please?
- Do you agree to being recorded?
- Participation in this interview is voluntary, you can choose not to answer any question you wish and you can end it at any time.
- Do you consent to your name being used in the study and referenced as Professor Paul A. Kirschner?

Interview with Professor Paul A Kirschner (leading expert):

Reason	Questions (staff)	Probe	Prompt
Ascertain and explore what makes up effective (quality) online TLA.			
Explore theme one from the focus group: Theme 1: Online TLA is different from face-to-face delivery	Can we simply take a session that was a really effective face-to-face lesson and deliver it online and expect to get the same results? Does online teaching require a different thought process, is it a different pedagogy in many respects/or should it be a different pedagogy?	Some of this you allude to in your video on tips for emergency remote teaching. Is online teaching different? Should online teaching be considered a different pedagogy?	What are the key differences?
How does evidence based practice align and relate to online teaching	Are there still guiding principles that are key when teaching online that must be included for long-term learning (AfL, retrieval practice)? There is/has always been a great debate within effective instruction of more	This is in reference to a paper you did in Computers in Human Behaviour (September, 2020) and comments at the World Education Summit (March 2021).	Is the underlying factor the way we process information to learn?

	<p>direct instruction vs discovery/constructivist learning (I have referenced much of your work on this).</p> <p>-How does online teaching fit into this debate?</p> <p>-Does this link to where students are on the expertise continuum?</p> <p>-What is the role of self-regulation and does online delivery help or hinder with this?</p>		
<p>Opportunities that online options offer to enhance the planning and implementation of instruction</p>	<p>You state in the Ten Steps to Complex Learning book that the arrangement of the steps may be 'reflective of a moderate – constructivist view of learning...' although the Ten Steps do place a greater emphasis on the guidance provided (p.315). You also mention how flipped learning is in line with the principles of the ten steps. What does this mean for online teaching? Is there more that online can offer and should be used for to support the development of long-term knowledge as we move away from Emergency Remote Teaching (Hodges et al, 2020) (i.e. not just teaching online – online is used for something else to support face-to-face delivery)?</p>	<p>Could the flipped approach be confused with constructivist and discovery learning?</p> <p>Principles of Instruction (2012) Principle 5 – guide student practice: Successful teachers spend more time guiding students' practice of new material</p> <p>Principle 9 – Require and monitor</p>	<p>The use of technology and online delivery is used for something else to support face-to-face delivery)?</p> <p>What are the key opportunities that teachers and institutions can utilise?</p>

	<p>The idea of deliberate practice has been around for many years (Anders Ericsson) and Rosenshine's principles state the importance of practice. Can the use of online approaches support with this and offer more opportunities to develop long-term knowledge through deliberate practice?</p> <p>Beginner vs Expert (when to use online resources)?</p>	<p>independent practice: Students need extensive, successful and independent practice in order for skills and knowledge to become automatic</p>	
<p>The interactional, social aspects of online teaching.</p>	<p>Clearly, some of the anecdotal issues that teachers have reported with online learning is the interaction and humanistic element that teaching in a classroom offers. You have previously focused on this (Influence of group member familiarity on online collaborative learning, 2009 & Use of web-based collaborative concept mapping to support group learning and interaction, 2017). How important is this for successful online teaching and does more attention need to be paid to this when designing programmes of learning that incorporate online elements?</p>	<p>Is it possible to recreate community online?</p>	<p>Does this link back to the first point that you can't simply replicate planned face-to-face delivery in an online environment?</p>

<p>Opportunities for online teaching and learning</p> <p>Now covered in opportunities section above</p>	<p>As we move from Emergency Remote Teaching (Hodges et al, 2020) required due to the pandemic, what are the real opportunities to utilise aspects of online teaching and learning that can genuinely support learning in mainstream educational settings (for example, a further education college like the one I work in)?</p>	<p>More opportunities?</p> <p>Link back to practice and assessment points.</p>	<p>What are the opportunities to really utilise online delivery in education?</p>
<p>Developing teachers to deliver quality online teaching and learning</p>	<p>Finally, clearly the development of the skill level of teachers is paramount if they are to make use of education technology. In 2007 you were involved in some research looking at how online communities of practice could be used for teacher professional development (not specific to developing technological skills). Do you have any views on how best we can develop the skills of teachers so they are confident in utilising technology (when and if needed) to support and enhance learning?</p>	<p>Limited technical skills were shown in a previous study to impact greatly on the effective use of online teaching...</p>	<p>Is it too much to say that all teachers should have a certain skill level in the profession?</p> <p>Incorporated into teacher educator programmes?</p> <p>For example, to be able to implement quick testing (Dunlosky et al 2013; Szpunar et al 2013; Pastotter & Bauml, 2014 & Healy et al, 2017) all showing how interpolate testing enhances learning during lectures – attention, note taking, reducing test anxiety, more information remembered, improvements in motivation...</p> <p>Hattie 2003, expert teachers are different from experienced teachers – most critically in the depth of processing that</p>

			their students attain. Could there perceivably be in the teacher effectiveness debates in the upcoming years how technology is used to support, stretch and develop long term knowledge?
Wrap Up			

University of Central Lancashire

Responding to Covid-19: Initial Exploration into Remote Learning

Phase 1: Participant Information Sheet – Driver

Please read the information below thoroughly before deciding whether or not to participate in this study.

Introduction

You are being invited to take part in a research study being conducted as part of the Professional Doctorate in Elite Performance at the University of Central Lancashire. Before you decide it is important for you to 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. Ask us if there is anything that is not clear or if you would like more information – our contact details are at the end. Take time to decide whether or not you wish to take part.

Thank you for reading this information sheet, which you should keep if you decide to take part in the study.

Purpose of this Study

The research study aims to explore remote learning and the use of technology following Covid-19. We are particularly interested in gathering your views on remote teaching, your future development and usage of technology, and wider aspects that play a role in delivery, such as virtual learning environments (VLEs).

Why have I been chosen?

You have been chosen to participate in this study because you have been impacted following Covid-19, and are currently delivering learning through remote practices.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will read this information sheet and complete the online survey.

The data from the survey will be analysed at a later date.

What is involved in participation?

Participation in the study will require you to complete a survey, which will take approximately 15 minutes to complete. The survey is a mix of questions on pertinent aspects regarding remote learning.

Benefits & Risks

The information you provide will help us understand more about remote learning, and the use of technology at the current time.

Confidentiality

Your responses will be anonymised during the data collection and analysis stages of the research. If the study was later published externally, your participation would be fully confidential.

The data collected will be stored on password protected/encrypted UCLan computer files and systems and will be appropriately deleted and all paper-copy files will be cross-shredded after 5 years.

Withdrawing from the study

Participation in this study is completely voluntary. You have the right to withdraw from the study up to two weeks post survey completion without any penalty. If you withdraw from the study, your comments will be deleted and all information about your involvement will be discarded. After this point, it will not be possible to remove you from the thesis.

Research Ethics

The University of Central Lancashire's BuSH research ethics committee has reviewed and approved this study.

If you have any complaints or issues about the study please contact Dr. David Grecic, Director of Studies, School, Sport, Tourism, and the Outdoors, UCLan. DGrecic1@uclan.ac.uk

If you agree to take part in this study, please contact the research team on the contact details provided below within two weeks of receiving this information sheet, and a convenient interview will be organised:

Steven Spence: steven.spence@sheffcol.ac.uk; 07737783506

David Grecic: DGrecic1@uclan.ac.uk

Effective teaching, learning and assessment practices in online environments

Phase 1: Participant Information Sheet – Driver

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Introduction

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Thank you for reading this information sheet, which you should keep if you decide to take part in the study.

Purpose of this Study

The research study aims to investigate effective teaching, learning and assessment practices in online environments. We are particularly interested in gathering themes of effective practice to inform future training programmes to enhance the curriculum design and delivery in post-16 education.

Why have I been chosen?

You have been chosen to participate in this study because you have a vast degree of experience and knowledge about online delivery.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form prior to the focus group. If you decide to take part you are still free to withdraw up to two weeks post focus group and without giving a reason.

The focus group will be recorded and later analysed. If you wish to participate in this study, please contact the researchers within two weeks of receiving this information sheet.

What is involved in participation?

Participation in the study will require you to take part in a focus group for approximately one hour. The focus group will consist of a number of questions to enable fact finding regarding online delivery practices. The focus group will be carried out and recorded through an online video conferencing tool, and transcribed at a later date. As part of the debriefing process you will see a copy of the focus group transcription if you so wish. If you would like to receive data from the analysis that will follow the focus groups, this will be available within six months.

Please note that your name and the college name will not be disclosed if the study is published externally.

Benefits & Risks

The information you provide will help us understand more about effective online delivery. You will also have the opportunity to reflect on issues relevant to you. As detailed above, steps have been taken to anonymise the data and therefore there is no risk that the results can be linked to any individual.

Confidentiality

Please rest assured that all information gathered in this study will remain completely anonymous and strictly confidential. Participants in the focus groups will be identified using a code number that will be assigned to each person.

The data collected will be stored on password protected/encrypted UCLan computer files and systems and will be appropriately deleted and all paper-copy files will be cross-shredded after 5 years.

Withdrawing from the study

Participation in this study is completely voluntary. You have the right to withdraw from the study up to two weeks post focus group without any penalty. If you withdraw from the study, your comments will be deleted and all information about your involvement will be discarded. If your data has already been anonymised and aggregated with other data it will not be possible to identify and remove it. However please be assured it will also not be possible to identify anyone from this aggregated data set.

Research Ethics

The University of Central Lancashire's BuSH research ethics committee has reviewed and approved this study.

If you have any complaints or issues about the study please contact Dr. David Grecic, Director of Studies, School, Sport, Tourism, and the Outdoors, UCLan. DGrecic1@uclan.ac.uk

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University of Central Lancashire

Effective teaching, learning and assessment practices in online environments

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Thank you for reading this information sheet, which you should keep if you decide to take part in the study.

Purpose of this Study

The research study aims to investigate effective teaching, learning and assessment practices in online environments. We are particularly interested in gathering themes of effective practice to inform future training programmes to enhance the curriculum design and delivery in post-16 education.

Why have I been chosen?

You have been chosen to participate in this study because you have a vast degree of experience and knowledge about online delivery.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form prior to the interview. If you decide to take part you are still free to withdraw up to two weeks post interview and without giving a reason.

The interview will be recorded and later analysed. If you wish to participate in this study, please contact the researchers within two weeks of receiving this information sheet.

What is involved in participation?

Participation in the study will require you to take part in an interview for approximately one hour. The interview will consist of a number of questions to enable fact finding regarding online delivery practices. The interview will be carried out and recorded through an online video conferencing tool, and transcribed at a later date. As part of the debriefing process you will see a copy of the interview transcription if you so wish. If you would like to receive data from the analysis that will follow the interviews, this will be available within six months.

Benefits & Risks

The information you provide will help us understand more about effective online delivery. You will also have the opportunity to reflect on issues relevant to you.

Confidentiality

Due to you being an international figure your name will be mentioned throughout the thesis. In taking part in this research, you accept that your name, and subsequent involvement in the research will not be confidential.

The data collected will be stored on password protected/encrypted UCLan computer files and systems and will be appropriately deleted and all paper-copy files will be cross-shredded after 5 years.

Withdrawing from the study

Participation in this study is completely voluntary. You have the right to withdraw from the study up to two weeks post interview without any penalty. If you withdraw from the study, your comments will be deleted and all information about your involvement will be discarded. After this point, it will not be possible to remove you from the thesis.

Research Ethics

The University of Central Lancashire's BuSH research ethics committee has reviewed and approved this study.

If you have any complaints or issues about the study please contact Dr. David Grecic, Director of Studies, School, Sport, Tourism, and the Outdoors, UCLan. DGrecic1@uclan.ac.uk

If you agree to take part in this study, please contact the research team on the contact details provided below within two weeks of receiving this information sheet, and a convenient interview will be organised:

Steven Spence: steven.spence@sheffcol.ac.uk; 07737783506

David Grecic: DGrecic1@uclan.ac.uk

INFORMED CONSENT FORM

Project Title: *Responding to Covid-19: Initial Exploration into Remote Learning*

Participant Name: _____

Please read and initial each statement:

I have read and understand the subject information sheet. I have had an opportunity to ask questions and these have been answered to my satisfaction.

I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason.

I understand that completing the survey is voluntary and my decision.

I understand that if I withdraw within the two-week period post-completion, all associated data will not be used and will be destroyed. If I wish to withdraw after the two-week period, it will not be possible to remove and destroy the data, but it will be anonymised.

I understand that I will be offered an opportunity to review and amend the data collected to ensure its accurate interpretation, to return it within the agreed timeframe, and that failure to return the data will result in it being used as read, within the study.

I understand that the data will be stored for a period of five years from the end of the project and then destroyed.

I agree to anonymised quotes being used within any publications or presentations resulting from this work.

I agree to take part in this study.

I would like a copy of the results.

Signature of Participant:

I certify that I have explained to the above individual the nature, purpose and possible risks associated with participation in this research study, have answered any questions that have been raised, and explained the signature will be collected through the completion of the survey online.

Signature of Investigator:

Date:

INFORMED CONSENT FORM

Project Title: *Effective teaching, learning and assessment practices in online environments*

Participant Name: _____

Please read and initial each statement:

I have read and understand the subject information sheet. I have had an opportunity to ask questions and these have been answered to my satisfaction.

I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason.

I agree to the focus groups being recorded.

I understand that if I withdraw within the two-week period post-completion, all associated data will not be used and will be destroyed. If I wish to withdraw after the two-week period, it will not be possible to remove and destroy the data, but it will be anonymised.

I understand that I will be offered an opportunity to review and amend the data collected to ensure its accurate interpretation, to return it within the agreed timeframe, and that failure to return the data will result in it being used as read, within the study.

I understand that the data will be stored for a period of five years from the end of the project and then destroyed.

I agree to anonymised quotes being used within any publications or presentations resulting from this work.

I agree to take part in this study.

I would like a copy of the results.

Signature of Participant:

I certify that I have explained to the above individual the nature, purpose and possible risks associated with participation in this research study, have answered any questions that have been raised, and have witnessed the above signature.

Signature of Investigator:

Date:

INFORMED CONSENT FORM

Project Title: *Effective teaching, learning and assessment practices in online environments*

Participant Name: _____

Please read and initial each statement:

I have read and understand the subject information sheet. I have had an opportunity to ask questions and these have been answered to my satisfaction.

I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason.

I agree to the interview being recorded and detailed notes being taken during the interview.

I understand that if I withdraw within the two-week period post-completion, all associated data will not be used and will be destroyed. If I wish to withdraw after the two-week period, it will not be possible to remove and destroy the data.

I understand that I will be offered an opportunity to review and amend the data collected to ensure its accurate interpretation, to return it within the agreed timeframe, and that failure to return the data will result in it being used as read, within the study.

I understand that the data will be stored for a period of five years from the end of the project and then destroyed.

I agree to my name being used in the research as an expert in the field.

I agree to take part in this study.

I would like a copy of the results.

Signature of Participant:

I certify that I have explained to the above individual the nature, purpose and possible risks associated with participation in this research study, have answered any questions that have been raised, and have witnessed the above signature

Signature of Investigator:

Date:

Appendix 8 – Consent Form (focus group)

Consent Form Focus Group

Please complete this consent form prior to taking part in the research.

This interview forms part of a Professional Doctorate in Education through the University of Central Lancashire (UCLAN). All ethical procedures have been followed and approval has been granted by the ethical approval board at the university. The key aim of the research is to synthesise commonalities in what constitutes effective online teaching and delivery.

This form is automatically collecting emails from all respondents. [Change settings](#)

I understand the nature of the research and have had the opportunity to ask questions about the focus group. *

Yes

No

I agree to take part in this focus group and agree for my data to be used for the purpose of this research. *

Yes

No

I understand my participation is voluntary and I may withdraw up to the point the data has been analysed and anonymised. *

Yes

No

I understand that the focus group will be video recorded online and transcribed as part of the data analysis. *

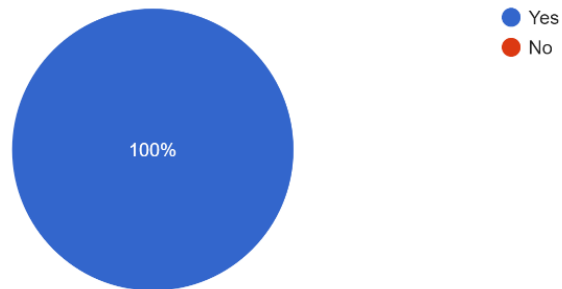
Yes

No

Appendix 9 – Evidence of Consent Form Responses (focus groups)

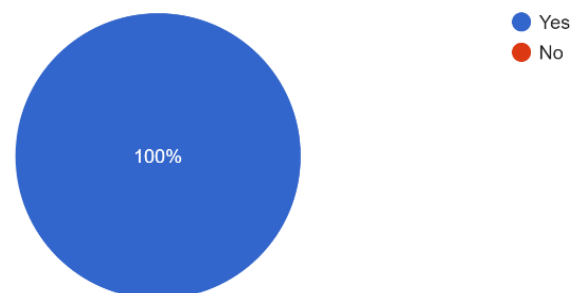
I understand the nature of the research and have had the opportunity to ask questions about the focus group.

11 responses



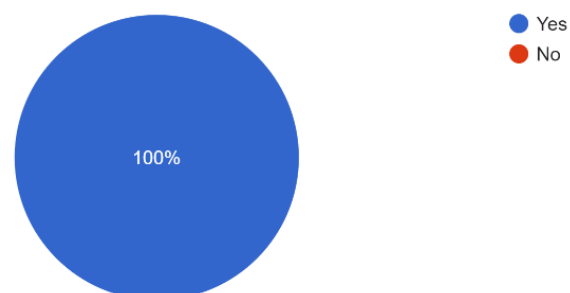
I agree to take part in this focus group and agree for my data to be used for the purpose of this research.

11 responses



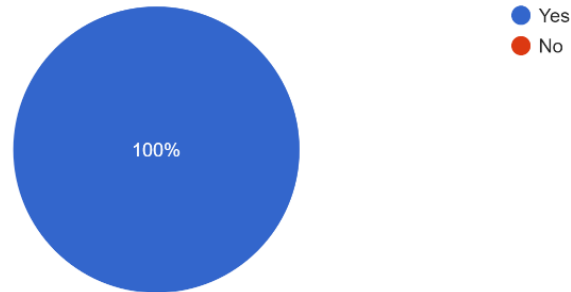
I understand my participation is voluntary and I may withdraw up to the point the data has been analysed and anonymised.

11 responses



I understand that the focus group will be video recorded online and transcribed as part of the data analysis.

11 responses



I understand the nature of the research and have had the opportunity to ask questions about the interview. *

Yes

No

I agree to take part in this interview and agree for my data to be used for the purpose of this research. *

Yes

No

I understand my participation is voluntary and I may withdraw up to the point the data has been analysed and anonymised. *

Yes

No

I understand that the interview will be video recorded online and transcribed as part of the data analysis. *

Yes

No

Appendix 10 – Consent Form (expert interview)

Consent Form Interview

Please complete this consent form prior to taking part in the research.

This interview forms part of a Professional Doctorate in Education through the University of Central Lancashire (UCLAN). All ethical procedures have been followed and approval has been granted by the ethical approval board at the university. The key aim of the research is to synthesise commonalities in what constitutes effective online teaching and delivery.

Email *

Valid email address

This form is collecting email addresses. [Change settings](#)

I understand the nature of the research and have had the opportunity to ask questions about the interview. *

Yes

No

I agree to take part in this interview and agree for my data to be used for the purpose of this research. *

Yes

No

I understand my participation is voluntary and I may withdraw up to the point the data has been analysed and anonymised. *

Yes

No

I understand that the interview will be video recorded online and transcribed as part of the data analysis. *

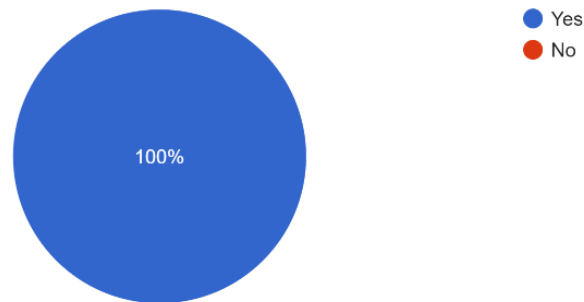
Yes

No

Appendix 11 – Evidence of Consent Form Response (interview)

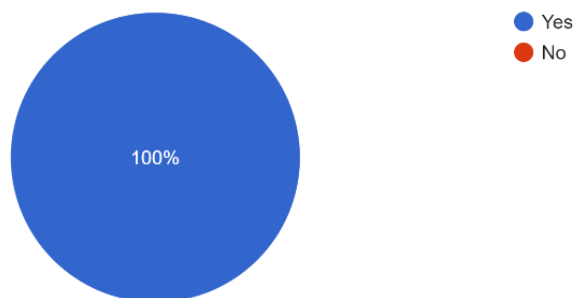
I understand the nature of the research and have had the opportunity to ask questions about the interview.

1 response



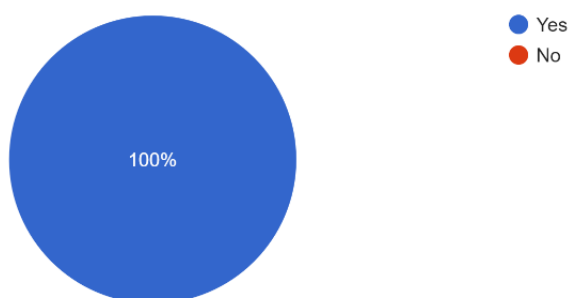
I agree to take part in this interview and agree for my data to be used for the purpose of this research.

1 response



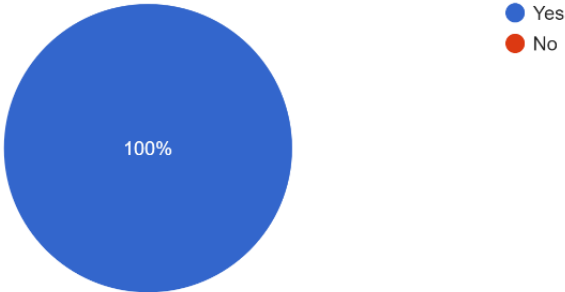
I understand my participation is voluntary and I may withdraw up to the point the data has been analysed and anonymised.

1 response




I understand that the interview will be video recorded online and transcribed as part of the data analysis.


1 response




Appendix 12 – Evidence of Focus Group One Recording

 Research (2021-03-22 at 09:13 GMT-7) ✕

[Details](#) [Activity](#) [Approvals](#)



Who has access



Private to you

[Manage access](#)

File details


Type
Video

Size
369.9 MB

Storage used
369.9 MB

Location
[Doctorate research](#)


Owner
me

Modified
22 Mar 2021 by me 


Appendix 13 – Evidence of Focus Group Two Recording

Research Focus Group 2 ✕

Details Activity Approvals



Who has access



Private to you

[Manage access](#)

File details

Type
Video

Size
292 MB


Storage used
292 MB

Location
[Doctorate research](#)


Owner
me

Modified
28 May 2021 by me ↻


Appendix 14 – Evidence of Interview Recording

 Interview with Professor Paul Kirschner (2021-07-21 at 23:56 GMT-7) ✕

[Details](#) [Activity](#)



Who has access



Private to you

[Manage access](#)

File details

Type
Video

Size
557.1 MB

Storage used
557.1 MB

Location
[Doctorate research](#)

Owner
me

Modified
22 Jul 2021 by me 