Supporting Teachers' capacity in the pedagogic use of ICT
An Action Research Case Study

By

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Abstract

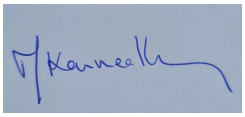
I undertook this Collaborative Action Research study, following the identification of a problem raised by students in a school survey regarding the lack of ICT use by teachers in their teaching. It was a focused, practitioner led study, rooted in the world of teacher practice. There were two main phases to this research. In the first phase two groups of teachers collaborated in creating OneNote classroom based assessments (CBA) templates through an adopted approach to teacher ICT professional development, the "collaborative apprenticeship model". Findings included positive claims regarding productivity due to the type of collaboration teachers engaged in becoming a community, with the possibility of becoming a Community of Practice. Positivity too regarding the innovative ability OneNote offered teachers to carry out student assessments. The second phase occurred when, in March 2019, COVID-19 forced schools to close with little time to prepare for the transfer of teaching online. There was an urgency to prepare teachers for online teaching. This resulted in an altering of my research question replacing "teaching" with "online teaching" and the delivery of a training intervention to address staff needs to teach online. Findings indicated that teachers felt more prepared and less anxious for the transfer online. Post closure a need was identified to conduct a staff survey to gather data on their online teaching. One key finding from this was the issue of lack of engagement by many students online. This led to conducting a student survey. Findings showed that students struggled with engagement as a result of poor Wi-Fi, lack of access to technology, responsibilities at home and the overload of homework which overwhelmed them.

Dedication

This paper is dedicated to a number of very special people in my life who inspired me and supported me throughout my career. Firstly, my mum, Tess McCarthy (RIP) and to my dad Gerard McCarthy M.A., who has always inspired me and supported me throughout this doctorate journey. My friend Mairead Murtagh, who was constant in her support and care for me. My darling daughters Kate and Louise and my amazing husband Charlie who was inspirational in his support and love for me during these research years.

Declaration

I have read and understood the Departmental policy on plagiarism.
I declare that this thesis is my own work and has not been submitted in any form for another degree or another institution of tertiary education.
Information derived from the published or unpublished work of others has been acknowledged in the text, and a list of references is given.

Signed: 

Date: 14th March 2022

Acknowledgements

I would really like to take this opportunity to thank my supervisor Dr. Anthony Malone for his unwavering support for me in this research study. His guidance and direction was invaluable to me throughout this study. This has been a challenging journey as it spanned the extraordinary events brought about by the arrival of COVID-19 which brought a number of challenges to my research.

I would like to pay tribute to the staff in my school who were generous in their collaborations with me throughout the duration of this research

To my wonderful Collaborative Action Research Committee (CARC), Louise, Daniel, Conor, Dominic, and Carol, I could not have undertaken this research without your commitment and support.

To the staff groups that volunteered at different stages of this research, I thank them for their eagerness and willingness to participate in the research process.

Finally, I would like to acknowledge and thank my Principal, Mr Fergus O'Brien for his support in enabling me to undertake this study.

Appendices

List of Figures

Abbreviations

CARC….....	*Collaborative Action Research Committee*
ICT….....	*Information Communication Technologies*
OECD….....	*The Organisation for Economic Co-operation and Development*
CATS….....	*Change in 3 steps*
CAR….....	*Collaborative Action Research*
AR….....	*Action Research*
APP……	*An App is computer software, or a program, most commonly a small, specific one used for mobile devices*

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Chapter 1: INTRODUCTION

1.1 Editorial Signpost

This is a single site action research study undertaken in a second level school in Ireland, by me as a senior school leader, working collaboratively with teachers, to address an issue raised by students, regarding the need for teachers to improve their use of Information Communication Technology (ICT) in their teaching, This chapter sets out by outlining the context in terms of my school, its profile and the relevant research issues are unpacked. Given that this study is undertaken by me as a senior school leader, the context of school leadership is provided followed by a reference to my positionality in undertaking this research explained. This is followed by an outline of the background and context of my research problem. The research question and the research aims are then provided followed by a brief overview of how I intended to progress these aims. Next, I set out to contextualise my study with regard to the national and international context of ICT in education. This is followed by a brief explanation of the purpose of my study and the theoretical frameworks I have chosen to support my study. I provide a summary of why this research is important to me as a researcher. As a practitioner undertaking academic research, I am attempting to address a research gap, that in the literature is highlighted by McGarr et al. (2019), between "the rhetoric of ICT in schools and the practice of ICT in schools" (Marcus-Quinn, Hourigan, and McCoy 2019, 767). In other words, through this research, an attempt to coalesce theory with practice is undertaken regarding ICT integration from a non-hierarchical, bottom up collaborative action research approach in my school.

1.2 My School Context

The following provides an outline of the school in which I carried out this research. I provide a brief overview of our school's commitment to ICT since the mid 90's and outline the opportunities and challenges our school encountered, over an almost thirty year period, in our attempts to integrate ICT into teacher practice and ultimately into teaching and learning in our school.

The study is set in an Irish island co-educational voluntary secondary school. When conducting this study we had a student population of 650 and a teaching staff of approx. 60. The senior school leadership team comprises of the Principal and myself the Deputy Principal. Generally, only students resident on the island are open to enrol in our school. This means as a school we are a community of practice within a landscape of communities. Our school is an established community within the landscape of communities, within our town, and as a community we are central to the lives of many residents on the island.

Our school comprises of students from a mix of cultural and socio economic backgrounds and abilities. We support and encourage students to achieve the highest academic results as possible through hard work and commitment. The ethos of our school centres on respect for each other. Students and teachers therefore are encouraged to promote the values of inclusion, collaboration and collegiality. We are a faith community who believe in the intrinsic value of a broad education. Our school recognises that each person is unique and has different gifts and needs. We therefore endeavour to ensure an atmosphere of caring and aim to foster a sense of belonging. Special concern is shown for pupils who are disadvantaged in any way and provision is made for non-academic students by adapting programmes of study to suit their needs.

1.3 School Leadership Context

As a senior management team, the principal and I, have adopted and developed a distributive approach to leadership. This has resulted in a very active and established management community of eight Assistant Principals. This management team is extremely important to us, as senior leaders, as they provide important support in the daily management of our school. We are very much informed by this team and the whole staff body in a "ground up" approach. We therefore do not approach decisions or impose decisions in a hierarchical way. This approach to leadership has resulted in a growing number of staff taking on the roles of change agents and opinion leaders as we endeavour to provide students with a positive, holistic experience of education in our school. A change agent is "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (Rogers 1995, 27) while "opinion leaders are informal leaders. They are members of the social system and earn the respect of others and serve as models" (Masullo 2016, 5).

1.4 My Leadership Context and Role as Lead Researcher

I undertook this research with the help of a collaborative action research committee (CARC). This committee was formed to assist me throughout the research process. I was lead researcher and a member of this committee. In terms of my role as both senior school leader and research leader, I am very aware of my positionality in regard to conducting this research. As a senior school leader and manager, the issue of power I realise needs to be highlighted and important for me, as researcher, to address. As a senior school leader there is potentially an issue that that my power within my role will have an impact on the outcomes of this research. I believe what Neumann (2018), claims from his research that instead of power flowing downhill from more powerful positions, power doesn't flow, instead it operates more like a web. As various people within a social, professional, or other kind of network exert power on each other they all help to spin the web. It is by working with teachers collaboratively, from a "ground up" approach that power will come from within these collaborations and not power directly from me. Neumann refers to Foucault (1978), who noted that power relations are "produced from one moment to the next, at every point, or rather in ever relation from one point to another" (93). My approach as a leader and the nature of this research will reflect Foucault's observation. Given the nature of my research methodology action research working collaboratively it is necessary for me in my dual role as school leader and research leader that I allow power to flow in this way. I therefore undertake my role in a form of collective leadership in which teachers develop expertise by working collaboratively" (Harris and Muijs 2002, 2). A note to the reader a more in-depth treatment of positionality is set out in the Methods Chapter 5.

1.5 Background and Context of the Problem

The following provides the reader with an outline of the background of ICT implementation and integration in the school prior to this study being undertaken. It explains the context which led to the identification of a problem that initiated this research.

The school has had a long journey regarding introducing ICT and ICT practices to teaching and learning. In the late 80's and early 90's, ICT use was limited to a class set of "Apple Macintosh" computers. These computers were limited in what they could do which limited

the ICT curriculum. In schools, at this early stage in the ICT roll out in schools, the ICT curriculum broadly attempted to introduce students to some very basics aspects of using computers. For our school the ICT curriculum was based on developing keyboard skills together with providing students with an introduction to word processing skills.

A small computer student society was operating but this was predominantly the domain of male students. In the mid 1990's, school management were keen to promote and increase the use of ICT in the curriculum and the school generally. They employed me as an ICT teacher, to expand ICT literacy to both the staff and student body. They invested in twelve new PowerMacs that allowed for the expansion of the ICT curriculum, to students. In this role, I worked with staff to develop their digital literacy skills, providing training in basic word processing and spreadsheet operation. At this stage, staff had a very low level of ICT competency, but were motivated to develop their technical ICT skill level, I was timetabled to provide training to students in similar applications as well as focusing on their keyboard skills. I offered evening courses to Parent groups. These courses were well attended and helped to create a stronger sense of community.

In 1997, I applied, on behalf of our school, to participate in the Department of Education's IT2000, Schools Integration Project (SIP) programme and was delighted to be selected to undertake a very prestigious and sizeable trial of the IBM "Wired for Learning" software. The result of our participation was that our school and the neighbouring primary school received a sizeable investment in our ICT infrastructure and the delivery of a comprehensive training program for teachers. This was a significant turning point for our school in terms of ICT integration and adoption. As a consequence staff gained considerable ICT competence which required them to adopt and incorporate the "Wired for Learning" framework into their everyday practice. We were engaged in this project for two years. Our trial of the software showed that it was not easily integrated into the Irish school context. Despite IBM's efforts to support our staff in the transition of Wired for Learning to our school practices it soon became clear that the software had been specifically designed for the American school system, and this led to difficulties to translate it fully to the Irish context. Differences in American and Irish educational language and practice, resulted in teachers encountering difficulties in applying its tools to their Irish classroom practice.

In the months following the end of the project, harnessing the investment we had received, I created a Learning Hub, an online website which enabled me to share resources with my students and therefore supported my own teaching and student learning. Student reaction was very positive to this as it enabled them to access resources, I had uploaded, online. A number of teachers learned about my use of the Hub and requested that I extend it to support other subjects. As a result, in 2000, I expanded the Hub, to become the School Learning Hub, and provided all teachers with access to it. The Learning Hub became a well-established ICT framework that was utilised by a number of staff and students in their teaching and learning. I continued to provide continual professional development supported by a number of teachers who were keen users of the Hub, to the staff body over the coming years until it appeared that the Hub had been well embedded in staff and student use. Following my promotion to Deputy Principal, in 2014, my focus changed to overall school management. The focus on ICT development lost momentum over these few years and in 2018, I began to get a sense that the use of ICT in the school had diminished greatly. Casual conversations held in the staffroom indicated that there was a possible issue relating to the use of ICT in teaching and learning. It was from these conversations that I made the decision, in collaboration with my Principal, to carry out a student survey (see Appendix A) to learn about student experience of teaching and learning in our school. It was from this survey that the issue of lack of use of ICT by teachers in their teaching was raised and this prompted the need for this research.

1.6 Research Approach

I selected a Collaborative Action research approach to undertake this study. My approach to leadership is collaborative and inclusive, listening to and valuing what teachers and students have to say. By selecting collaborative action approach, I was able to undertake a research process in which participants came together to systematically examine the use of ICT by teachers in their teaching, in our school and through using the techniques of this research, sought solutions to enhance the teaching and learning process for teachers and students (Messiou 2019). The qualities of Collaborative Action Research promote a community approach of co-researchers in addressing a concern or issue relating to educational improvement.

1.7 Research Question and Research Aims

The following details how I formulated the research question for this study. It also lists and provides details of the aims of this research.

The issue raised in the student survey led to a series of actions that led to the formation of a new teacher ICT committee, who took responsibility for the selection and integration of a new ICT framework – Office 365. Following a year rolling out this new framework to staff, providing training in a number of Office 365 tools, in September 2019, I was joined by five staff volunteers to form a collaborative action research committee (CARC). This committee would engage fully with me from this stage on, supporting and collaborating with me on all aspects of the research. Following this I undertook the decision to initiate the reconnaissance phase of this research to identify possible ways to address the research issue. By the end of the reconnaissance phase I had formed the research question for this study which was; "how can I as a senior school leader work with teachers to improve their use of ICT in their teaching"?

Based on this research question I identified two main aims of this research. These are;

A. To initiate a whole staff examination of ICT use in school practices.
B. To create a series of action research interventions, using a newly adopted ICT professional development approach, to enable teachers to adopt, implement and review an innovative ICT approach to their practice.

1.8 Irish and International Context to policy and ICT Implementation in Education

The following provides the reader with a review of ICT Policy and Integration in education today firstly in the Irish context then followed by the international context. The purpose of this section is it helps to situate my work within a broader context, both at national and international level.

1.8.1 Irish Context

An analysis of educational technology policy in Ireland from 1997 to 2017, McGarr and Johnston (2019), noted that there were three policy driven stages. These stages began with a drive to introduce technology into schools, followed by an exploration of how the use of technology could transform the lives of students outside of school and in the final stage a focus on the need to change the education system so that technologies could be capitalised effectively to facilitate more independent and student-centred learning (769).

In 2015, the Department of Education launched its "Digital Strategy for Schools (2015-2020)" with the primary focus of 'enhancing teaching, learning and assessment' (Department of Education and 2015, 771). This was a significant measure in terms of promoting the use of ICT in teaching and learning as at its core was a commitment to the inclusion of ICT skill development. "This is particularly important given that teacher skills and confidence in the effective pedagogical use of technology have been identified as key barriers in embedding technology in teaching and learning" (McCoy et al., 2016,772). In 2018, as part of Project Ireland 2040, €210m was committed, under the Digital Strategy, to support investment in ICT infrastructure for schools. In announcing this investment, the Minister for Education and Skills, Mr Joe McHugh stated; "Our Digital Strategy for Schools sets out a clear vision that is focused on realising the potential of digital technologies to transform the learning experiences of students." Over the past number of years, Ireland has witnessed a considerable period of educational reform. Among these reforms has been the provision of a Framework for the New Junior Cycle (Department of Education and 2015) requiring "the integration of innovative approaches to teaching and assessment in Ireland with the chief aim of enhancing students' overall experiences within the typical school environment" (Marcus-Quinn, Hourigan, and McCoy 2019, 773).

The rationale for the introduction of the new Junior Cycle Framework into schools arose from the need to link the Junior Cycle curriculum to primary education more cohesively with post primary; to incorporate and respond to the changes that are being experienced by Irish society; to focus more on pupil development and their identified needs and educational outcomes; to develop pupils' key skills; to reduce the emphasis on an exam focussed curriculum; to develop pupils capabilities in being able to take their place in a changing world; provide greater teacher autonomy.

There is an emerging expectation that teachers will not only incorporate more digital resources into their teaching practice but that they will also become producers of such digital content (Ganapathy et al. 2017; Ganapathy, Wei, and Jong 2015). However, many teachers do not have training in the design and development of digital resources (Akpinar and Simsek, 2007; Baytak and Hirca, 2013) and as a result, many design features can be overlooked, and classroom resources may not be as effective as anticipated. McCoy et al.'s (2016) research consistently highlights how effective leadership is crucial to the smooth and effective integration of digital technologies in schools.

> *"Now is the time for clear leadership by schools in terms of how they can provide an enriched learning experience, be that through exclusive or targeted use of technology across the whole school, tailored to suit the needs of their students and teachers" (p.777).*

As such this does not need to be a top-down process coming from the Department of Education and Skills but instead can develop in tandem with, and organically from, the bottom-up school-level, bringing together the various levels of expertise in an autonomous school community (Marcus-Quinn, Hourigan, and McCoy 2019). This approach would see schools harness the potential of digital technologies to support learning, to tailor teaching approaches and provide students with the skills they will need for the 21st century. In order for this to happen, the Department of Education and Skills needs to support schools in their decision-making, perhaps through providing a roadmap showing what successful technology use looks like. As a society we need to move away from the ongoing conversations around personal devices, which is missing the point. We need to facilitate schools learning from each other's experiences (the successes and the failures) and from their best practice. If the benefits of ICT are to be maximised, the potential of ICT and other developments will require a willingness and enthusiasm to share and learn expertise, insight and vision within and across school contexts, supporting leaders within schools. It is for this reason I have placed the emphasis on community action research approaches to my research.

1.8.2 International Context

According to McGarr et al. (2019), when examining the international technology policy landscape, there appears to be a uniformity of response to the perceived challenge of integrating technology in schools. They explain;

> *"This uniformity is a result of significant "policy borrowing" and the influence of powerful and very persuasive agents such as the Organisation for Economic Co-Operation and Development (OECD) and the World Bank, the World Trade Organization (WTO), International Finance Corporation (IFC), and the European Union (EU; Ball, 2013) and the increasing influence of the process of globalization on policy at national and local levels" (McGarr and Johnston 2019, 842).*

McGarr et al. (2019) suggest that this approach to policy formation is often as a result of pressure and therefore referred to as "symbolic policy" formation rather than policy formation that is focused specifically on changing practices from the ground up in schools (860). They are formulated and driven by fears related to international competitiveness, and many countries have seen the launch of largely similar initiatives in technology in education over the past two decades (McGarr and Johnston 2019). According to Rizvi et al. (2010), they usually carry little or no commitment to actual implementation in schools and "usually do not have substantial funding attached" (Rizvi and Lingard 2009, 9).

Globally the changing workforce, rapid advancements in digital technology and increased competition mean that learning is more critical than ever. Education systems are being confronted with the need to change to meet the challenges of today's rapidly evolving digital society. This requires schools in particular to develop and implement a long term vision to ensure their students are fully equipped, in terms of knowledge and skills, to be successful in the 21st century (Butler et al. 2013). According to Ottestad et al (2018), in European countries, policies for economic, social, and political developments are increasingly being directed towards prioritising the impact and importance of a digitized society, including for the educational sector. For example, Gu et al's report (2015), provides examples of at least 20 countries initiating change in education through e-Textbook projects. For some governments, ICT has been placed at the core of their education system. The Netherlands for

example launched the “Wikiwijs project” in (2009), “an open, internet-based platform” (Marcus-Quinn, Hourigan, and McCoy 2019, 776), to demonstrate their commitment to creating a realistic approach to incorporating ICT into schools by enabling teachers to, create and share educational resources. According to Lawrence et al (2018), the UK government invested £2.5 billion in 2008–2009 on improving ICT infrastructures in teaching and learning in schools while in United States, the expenditure on K-12 schools was $6 billion.

> *“Despite all these investments on ICT infrastructure, equipment and professional development to improve education in many countries, Studies (Cuban, 1986; Cuban, Kirkpatrick, & Peck, 2001; Eteokleous, 2008; Hayes, 2007) have shown the results are not promising, and the intended educational outcomes have not been achieved. Gülbahar (2007) concurs with the findings that huge educational investments have produced little evidence of ICT adoption and use in teaching and learning” (Lawrence and Tar 2018a, 81).*

Given the diversity that exists within European member states, it is understandable that this diversity also exists in terms of policies relating to the integration of ICT in education. Policy for ICT use in teaching and learning requires a clear rationale, a set of goals and a vision for how and why ICT should be used in schools. Implementation of such policies are critical to motivating school change and co-ordinating a range of efforts so as to meet the challenges of preparing young people to live, work and learn in the 21st century. In an effort to modernise education and training to meet the challenges posed by the integration of digital technologies in education the EU have developed the Digital Education Action Plan (2021-2027), an EU policy initiative aimed at supporting “the sustainable and effective adaptation of the education and training systems of EU Member States to the digital age”(ec.europa.eu 2022). It aims to foster development of a “high-performing digital education system” and enhance digital skills and competences for digital transformation in schools (ec.europa.eu 2022). According to Ottestad et al. (2018), a general development of policies for ICT in primary and secondary education in Europe is the move toward a more

> *“fine-grained understanding of different strands of applications of digital technologies. Initiatives concerning supporting ICT to improve subject-specific learning processes and general learning outcomes are increasingly being separated from initiatives supporting the fostering of digital competence” (Ottestad and Gudmundsdottir 2018, 6).*

Schools and in particular teachers now face the challenge of providing opportunities to develop ICT skills to today's students. This requires teachers to have a level of ICT competence to enable this to happen. For this reason continuous professional development may ensure a dynamic and adaptable approach to providing learners with the competences necessary to effectively participate in society. However, according to Drossel et al. (2017), the lack of ICT competences;

> *"at both didactic and methodological level has been found to constitute a hindering factor to the integration of new technologies in class (cf. Drossel et al. 2015; Eickelmann 2011), the professional development of teachers has the potential for taking countermeasures (p.1).*

1.9 Theoretical Frameworks of this Study

Having explored the field of literature relevant to the broad themes in my research, such as change, innovative ICT integration, ICT teacher professional development, communities of practice, technological competence, I sought theoretical frameworks which would provide me with a lens through which I could view this study. I sought theories that related to building ICT knowledge in a contrasting way to the traditional forms of ICT professional development. This led me to the theory of Social Constructivism. In seeking to integrate an innovative approach to teacher practice, I was drawn to Roger's theory of Diffusion of Innovations which provided some key components that would encourage greater teacher adoption of a new innovative approach to an aspect of their practice. As I carried out my research I discovered not only that these theories independently supported my research but that together they provide the key elements which led me to create a new concept in terms of ICT professional development in our school. The basis of social constructivism in my research is teachers engaging with each other in a small group format sharing and building knowledge together. This knowledge is not only technical but also pedagogical, as they learn how to apply ICT as a department to the shared practice of CBAs. Within this group format, key individuals who provide a formal and informal form of leadership help to support the diffusion and adoption of the innovative practice.

Social Constructivism

The first theoretical framework I selected was social constructivism. Social constructivism developed by Lev Vygotsky emphasizes

> *"the impact of social and cultural influences on students, the ways their varied backgrounds and experiences shape students' learning, and the ways students understand and interpret concepts. Vygotsky believed that learning does not just take place within the individual. He argued that learning is a social and collaborative activity where people create meaning through their interactions with one another." (Schreiber and Valle 2013, 396)*

According to Nawaz and Kundi (2010), social constructivism emphasises "collective learning". Learning is active, contextual and social and for this reason the best method is "group learning" where there is a facilitator and guide (Nawaz and Kundi 2010, 32). As much of my research required a dialogic and collaborative approach, this theoretical approach provided a key lens for this study. The promotion of group learning supported by a facilitation type of instruction informed the format of how we, the CARC members, would approach developing a new approach to ICT professional development.

Diffusion of Innovations

The second theoretical framework, I chose relates to technology adoption. Roger's (1995), diffusion of innovation theory provides a theoretical view of how ICT innovations spread within and between communities. This theory "defines innovation as an idea, practice or object (ICT) that is perceived as new by the adopter" (Rogers 1995) . This suggests that perception is related to the individual however, in the case of this study, given the adoption of the lens of social constructivism, I was interested to explore how the innovation is perceived as new by a group of adopters. Given that ICT can create uncertainty in the minds of teachers (e.g., about its expected consequences or effect on their teaching), it can also create an opportunity for teachers to reduce uncertainty in another sense (its potential ability to improve teaching and learning). As teachers become more aware of the opportunities and less worried about the uncertainties posed by the innovation, there is greater potential for adoption of the innovation into practice and raised levels of teacher ICT efficacy (Lawrence and Tar 2018b). This efficacy is demonstrated in both teacher's capacity and capability in applying the innovation. This theory highlights the importance of leadership in supporting the processes of change. The roles of "change agency", "change agents" and "opinion leaders"

in the diffusion and adoption of innovations were critical to the success of diffusion and adoption in this study. The change agency, in this research related to me, as a senior school leader and lead researcher. I undertook the task of responding to requests by students to experience increased use of ICT in their teaching and learning by initiating a whole staff action that aimed to address this issue. In addition I was central to the management the process of change relating to ICT integration in our school. Once action was initiated, I also became a change agent, who was joined by my fellow members of CARC, also change agents, to influence teacher innovation-decisions in a direction deemed desirable by the change agency. Opinion leaders were the group leaders of the small professional development teacher groups, who had a role of informal leaders for the group. They were central to support diffusion and adoption of the innovative practice within their group. They were members of the teaching staff who had earned the respect of others and serve as models to staff members.

Blending of my two selected Theoretical Frameworks

Bondarouk, (2006), claims that social constructivists explain technology-adoption as a process of involving social groups into the innovation process where learning takes place on the learners' experiences, knowledge, habits and preferences. Roger's diffusion theory outlines how leadership roles in the technology-adoption process can help support and encourage technology diffusion and adoption. Fig. 1 illustrates how fusing aspects of these theories, in my study, led to an innovative application of the "Collaborative Apprenticeship Model" of ICT Professional Development in our school. Combining these two theories, provided me and my CARC colleagues with a framework that guided and informed us in selecting an alternative approach to ICT professional development in our school both in terms of social learning and supporting and diffusing this learning within small groups. It informed our creation of a series of action interventions which brought teachers from novice to expert learners in the understanding and pedagogical application of the new innovative approach to undertaking CBAs. Combining change agents and opinion leaders with social constructivist learning produced an extremely effective and welcome approach to ICT professional development. Change agents and opinion leader provided differing levels of leadership, formal and informal, to support teachers to share and build knowledge together in a joint social learning process.

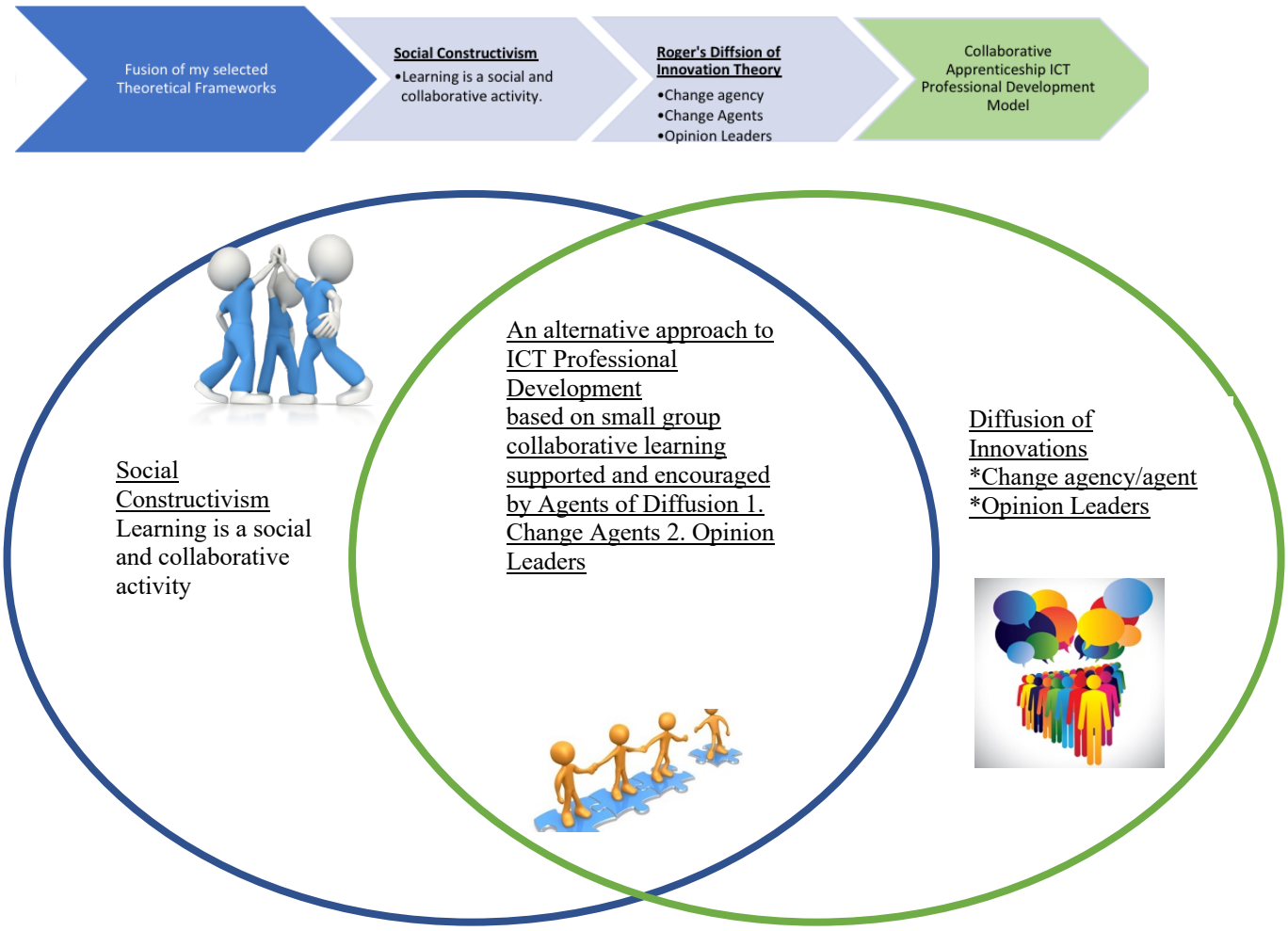


Figure 1. Fusion of my chosen theoretical frameworks

1.10 Structural Layout of Thesis

The remainder of this thesis was organised as follows;

Chapter 2 Literature review; An examination into existing research on the aspects of change required to increase the use of ICT in teaching and learning, focusing particularly on school leadership and teacher practice. It examines research carried out on ICT integration into teaching and learning and the importance of innovative approaches to Teacher professional development in the drive to encourage greater ICT adoption in teacher practice. The review establishes the connection between change, leadership and teacher practice in relation to ICT adoption and integration before identifying how through a move from the traditional approaches to ICT professional development teachers can achieve increased competency in ICT to enable them to integrate ICT into their teaching to enhance student learning.

Chapter 3: Current Context; This provides a short account of the action research question Where are we now? And how did we get to this point? An account of the context that brought this research to stage where we could undertake the reconnaissance stage of this study.

Chapter 4: Reconnaissance; This provides a comprehensive account of the process undertaken by me in collaboration with the teaching staff on how we set about addressing the research issue. It details the process of collaboration we undertook which finally enabled me to establish the research question of "how can I as a senior school leader work with teachers to improve their use of ICT in teaching?". Following clarity on the research question I was able to work with my volunteer teacher research committee (CARC) to produce a series of interventions that would aim to increase teacher use of ICT in teaching leading to enhanced student learning experiences.

Chapter 5: Methodology; This focuses on the methods, instruments, and approaches to collecting and analysing the qualitative data gathered from this collaborative action research study.

Chapter 6: Collaborative Action Research Interventions Phase 1; This provides a detailed account of how through my leadership, the CARC undertook Collaborative Action Research cycles, over a process of three interventions. As we undertook each intervention, the findings and results from that intervention provided direction and recommendations to the planning and action to the following intervention.

Chapter 7: A Global Pandemic – Collaborative Action Research Phase 2; This details the second phase of my research which took place following the arrival of the COVID-19 Pandemic. This unexpected event led to the closure of schools across Ireland with little or no time to prepare. As a result, this necessitated me to re-orientate my research focus and take action to support teachers to rapidly transfer teaching online. The unforeseen limit on time meant that only one key intervention could be implemented before school closure.

Chapter 8: COVID-19 Post Closure Staff Survey of Online Teaching; This resulted from the continued school closure due to COVID-19 and the need to identify how teachers might be further supported during this time. To do this I and my research committee (CARC)

undertook a teacher survey to gather a rich data set, during this "once in a lifetime" event to identify what actions we could take to enable teachers to provide the best level of online teaching they could. The results and analysis of data collected are outlined and the subsequent action proposed.

Chapter 9: COVID-19 Post Closure Student Survey of Online Teaching and Learning; Following the identification of an issue in the teacher's survey with student engagement, we undertook a student survey to examine why there appeared to be a problem with student online engagement during school lockdown. The results and analysis of data are outlined, and subsequent actions proposed.

Chapter 10: Key Findings, Contributions to Knowledge and Potential Issues for Further Research; This provides an account of the key findings of my research and how I believe these findings can contribute to the research literature and to improve practice. In addition it sets out recommendations for further research arising from the findings of this study.

Chapter 2: – LITERATURE REVIEW

2.1 Brief outline of this Chapter 2

This chapter sets out how I approached my review of literature for this study. I outline how I focused on three main themes central to my research and explore key literature I identified that relate to my research themes. As I undertook my action research there was a synergy between conducting my literature review and conducting my research. Each aspect of this research informed the other, that is my literature review informed my action cycles and my action cycles informed my literature review.

2.2 Overview

This research study focuses on how I can, as a senior school leader, work with teachers to improve their use of ICT into their teaching? According to Arnseth & Hatlevik (2012), Integration of ICT, Information, Communication, and Technology, in teaching and learning refers to the use of computer- based communication that incorporates ICT into daily classroom instructional processes. These processes are focused on "preparing students for the current digital era, teachers are seen as the key players due to the capability of ICT in providing dynamic and proactive teaching-learning environments" (Ghavifekr and Rosdy 2015, 175). This is significant as it emphasises that technology is not only transforming the way we live our lives but, also in how we teach in schools. This means that just as technology is shaping profound changes in society and economies, schools cannot and, must not, fall behind. In order to provide students with the skills and competencies they need to achieve their potential, schools must embrace technology fully and engage in change. Investment is critical, not only financially but in terms of time and commitment to achieve ICT integration in schools. A view by the OECD (2018), regarding the use of ICT in the classroom claims that using ICT "is likely to affect the instruction time and the curriculum to which students are exposed, as well as the teaching and learning processes they experience" (29). A similar view is that "modern technology offers many tools that can be used in classrooms to improve teaching and learning quality" (25). With such important claims, it is necessary to consider why there have not been greater advances in the use of ICT in the classroom given the many

positive reasons to do so. McGarr et al. (2019), suggest that there is a huge gap in the rhetoric of ICT in schools and the practice of ICT in schools. Indeed, despite the plaudits and promises of improved learning outcomes regarding ICT in the classroom, according to Ohlin, (2019), an increasing number of international research studies have indicated that teachers have not integrated ICT in the curriculum in a way that leads to significant changes in classroom practice. According to the IEA's *International Computer and Information Literacy Study,* (ICILS 2013; Fraillon et al., 2014), teachers in many countries use ICT on a less regular than expected basis, despite the increasing potential of using ICT within teaching and learning.

2.3 Identification of Literature Themes

My review of literature, explores three key themes. These themes were "Change", "ICT integration" and the "ICT teacher professional development". The rationale for examining these three themes not only stemmed from this review but also from analysis of my research question; "how can I as a senior school leader work with teachers to improve their use of ICT in teaching?". In the context of this research it is important to note that the term "improve", is understood in this research as bringing change by "advancing', "progressing" or "increasing" teachers use of ICT in their teaching." In considering change, I have examined change theories which inform decisions on change. As the lead researcher and senior school leader, the importance of the role of school leadership in bringing about change is explored. Given the focus of this research on improving teachers adoption and use of ICT in their teaching, an extensive examination of research relating to this theme was conducted. The term "their use of ICT in their teaching" refers to working and supporting teachers as they develop and apply ICT competencies to confidently use ICT in their teaching practices. This therefore required the examination of literature relating to "teacher ICT professional development".

2.4 Theme 1: Educational Change

According to Thompson (2014), "change occurs because individuals see a need to grow, learn, and change their behaviour" (p.28). Change is a process, not an event. "Understanding the dynamics and implications of change becomes a powerful means for the successful implementation of an educational innovation" (Speck 1996, 3). There have been a lot of change theories proposed by leading scholars, to explain these dynamics and implications

that have a “foundational influence on conceptualizing organizational change processes” (Beycioglu and Kondakci 2021, 792). Such models include Lewin’s (three-stage theory of change), Kotter’s (eight-step process of change) and Roger’s (diffusion theory).

2.4.3 Change Theories

Kurt Lewin, often referred to as the founding father of change management, created his theory “CATS”, “Changing as three Steps” (see Fig. 2) in 1947 (Sonenshein 2010). CATS is a theory that refers to how in managing change an organisation must progress through the phases illustrated in (Fig. 2) of unfreeze, to become motivated to change, change which requires individuals to cognitively restructure so that they can adapt to change and lastly to refreeze, achieving meaningful and permanent change.

John Kotter, developed the “Kotter’s 8 Step Change Model” to increase every individual’s ability to change and improve their chances of success (Perlyasamy 2022). For change to happen, it helps if the whole company really wants it. By developing a sense of urgency around the need for change, which may spark the initial motivation to get things moving. His 8 step model undertakes a process from creating a climate of change in an organisation, to engaging and enabling the organisation to action change to finally implementing and sustaining change.

The change model developed by Roger’s innovation-decision process describes as “an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation” (p. 172). This process of change involves five steps: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. In the first step “knowledge”, the individual learns about the existence of innovation and wants to know more about the innovation. ““What?,” “how?,” and “why?” are the critical questions in the knowledge phase” (Sahin 2006, 3). The second step the persuasion step, is where the “individual shapes his or her attitude after he or she knows about the innovation” (Sahin 2006, 3). The third step, the decision step, is where the individual chooses to adopt or reject the innovation. The fourth step, implementation, the innovation is put into practice, while the fifth step is, following the decision to implement innovation, the individual now looks for reassurance and support for the decision they have

made. I have adopted Roger's theory as a lens to view aspects of ICT adoption in my study. In particular I have chosen Roger's key aspects of "change agency", "change agents" and "opinion leaders" to integrate into my research. I have provided a further discussion on my chosen theoretical frameworks in the Methodology Chapter 5 of this study.

2.4.4 A Focus on Lewin's theory of Change - CATS

Kurt Lewin (1890-1947) was a social psychologist whose extensive work covered two key aspects of my research study, firstly the action research approach to research, my chosen methodology for this study, and secondly as this study will require our school to undertake a process of change, I am taking a closer examination of his unfreeze/change/refreeze change management model (bl.uk) (Fig. 2)

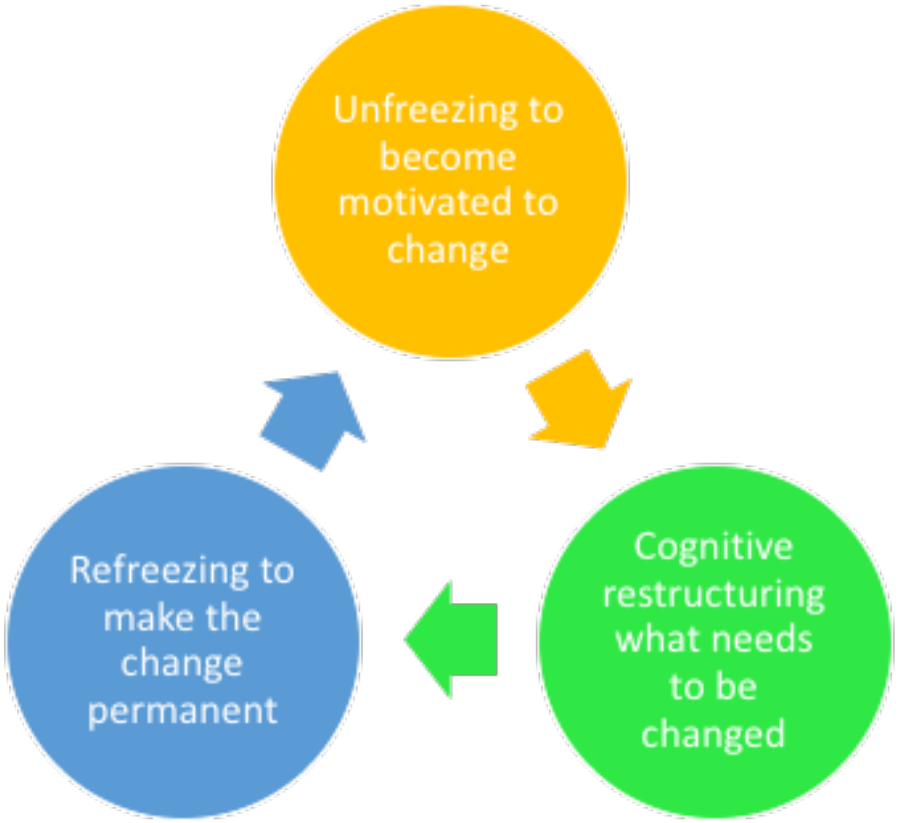


Figure 2. Kurt Lewin's Change Theory CATS

2.4.5 Stage 1 – Unfreezing

The unfreezing stage is probably one of the more important stages to understand the world of change we live in today (Connelly 2020). This stage is about getting ready for change. It is the stage where change is deemed necessary, where an organisation prepares itself for change, ideally creating a situation where they want change. The greater the sense of urgency for change the greater the motivation will be for change. In order to understand the process of change Kurt Lewin used his "Force Field Analysis" (Fig. 3) to explain how change will happen whenever driving forces are stronger than restraining forces (Cummings, Bridgman, and Brown 2015). In terms of an organisation, such as a school, there will always be driving forces that make change attractive to staff members and restraining forces that work to keep things as they are (Connelly 2020). "To bring about any change, the balance between the forces which maintains the social self-regulation at a given level has to be upset" (Lewin 1948, 47). According to Raza (2019), "we must agitate the equilibrium state in order to instigate a behaviour that is open to change. Lewin suggests that an emotional stir-up may disturb the group dynamics and forces associated with self-righteousness among the individual group members". Once individuals become open to change due to an increase in the positive forces for change or reduction in the obstacles to change, the process proceeds to stage 2.

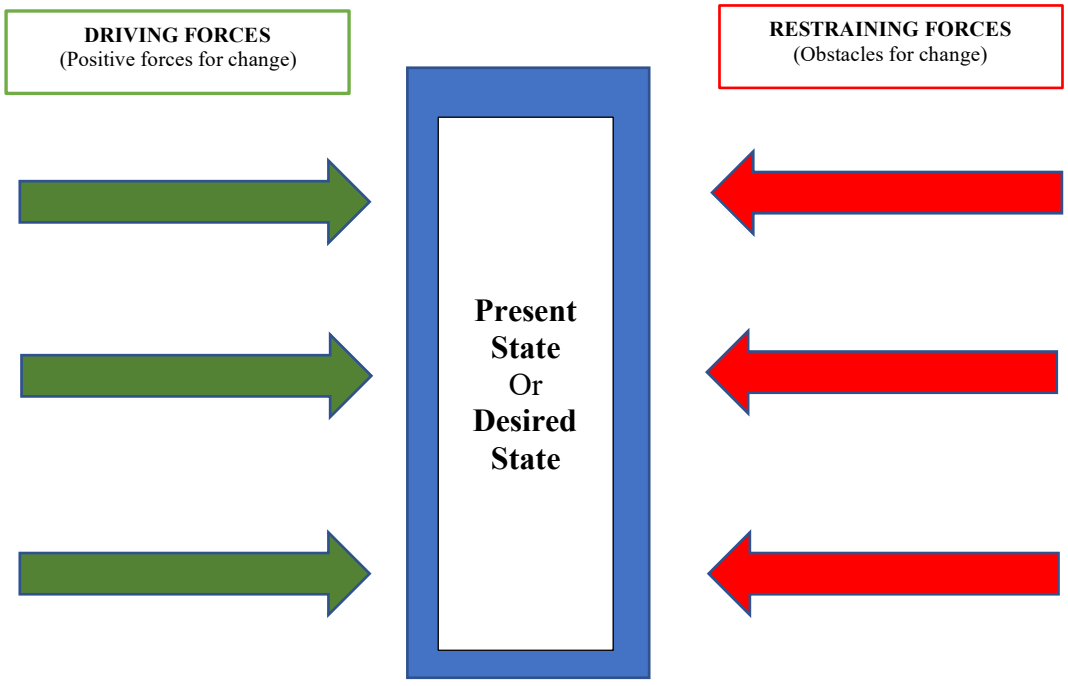


Figure 3. Kurt Lewin's Force Field Analysis

2.4.6 Stage 2: Change or Transition - Unfrozen

This stage in the process of change, Lewin refers to as the transition stage. This phase is can be the hardest for people as it can disturb the established practices and create anxiety and fear as they can feel unsure of the impact of this change on their lives. The process of change takes time. It is essential that the individual is given support through training or mentoring to transition and adapt or adopt change. Role models such as change agents and adopters help the process of change.

2.4.7 Stage 3 Freezing or Refreezing

The final stage referred to as refreezing. This is about establishing stability once the changes are accepted. The goal of this stage is to "refreeze" in this new state "so they no longer resist forces that are trying to implement the change. The group norms, activities, strategies, and processes are transformed per the new state"(Raza 2019). However, it is important to take the appropriate steps to sustain and reinforce this new status quo. These steps include identifying change supports and change barriers, providing opportunities for staff feedback and other forms of communication and the provision, both formal and informal, of training and support. A key step is ensuring leadership throughout the organisation supports and adapts to change.

2.4.8 The role of Leadership in promoting educational change

"A traditional view of school leadership is occasionally criticized as focusing entirely on the explanation and prediction of school productivity outcomes than on school change itself" (Park and Jeong 2013, 36). Research carried by Tulowitzki et al. (2022), suggests that school leaders play a key role in this context as drivers of innovation including those related to ICT. School leaders are influential as change agents in the adoption of ICT in their schools. Efforts relating to school reform often demand a new leadership style for effectively guiding school change. Every teacher is an instructional leader with a leadership role. Middle school leaders play also important role as change agents, supporting senior school leadership and the teaching body. They spend time mentoring staff and developing educational programming in

an effort to improve student learning. This is significant for me as the senior school leader and lead researcher in my study. Effective school leaders;

> *"are consistently mindful of best practice while instructing and encouraging the teaching staff to adopt these learning techniques in the classroom. Taking risks and trying something new is common for the instructional leader. With student learning at the centre of any school, all effective leaders think that more can be done to improve outcomes. Spending time on best practice and keeping current with research translate into improved student learning" (Barkman 2015, 14).*

Responding to school reforms, principals are requested to become "the gatekeeper, change agent, and facilitator of change, not simply the manager of the status quo." (Park and Jeong 2013, 36) According to Copland (2001), principals are required and expected to provide leadership that is visionary, instructional, transformational and managerial in driving school reforms. The consequence of this is that the expectations on principals today have risen greatly in the past decade. The skill set now required to provide the leadership that is expected is beyond what many principals who took up the role ever envisaged. Gilley et al. (2009), claim that predictors of successful implementation of organisational change require principal leadership to display specific leader behaviours such as the ability to motivate, communicate, and build teams. In relation to school change, the principals' role in facilitating and supporting school change is crucial. Vilakazi (2008), examining the role of the principals as agents of change, holds the view that there is a need for greater sharing of the responsibilities principals carry. The implementation and delivery of change in schools should be undertaken by educators with the principal at the helm. Sharing the focus and responsibility for change in schools is essential and a move away from a "highly authoritarian hierarchical structure to one that requires a sharing of control with educators, learners and parents" (Vilakazi 2008, 14).

Moreira et al. (2019), refer to several studies that identify leadership as a key factor in promoting innovative processes in the use and integration of ICT in classrooms. The successful implementation of ICT integration, requires educational change, and is directly influenced by the role of school head teachers (Jogezai, Ismail, and Baloch 2020). However, if school head teachers fail in "providing a roadmap for future school ICT development, staff may not feel encouraged to adopt more ICT-based teaching A lack of whole-school vision

regarding ICT typically leads to a divide across classrooms, where only the teachers who wish to adopt ICT-based methods will do so"(McCoy et al. 2016, 24).

2.4.9 Change, Leadership and ICT implementation

"Research consistently highlights how effective leadership is crucial to the smooth and effective integration of digital technologies in schools" (Marcus-Quinn, Hourigan, and McCoy 2019, 778). As leaders of learning organisations, principals are expected to provide leadership for learning. "Leaders need to learn and leaders learn as they lead" (Swaffield and MacBeath 2008, 1). Approaching their leadership in this way requires actions that are based on team dynamics, a collaborative approach, and puts an end to the idea that principals can provide the basis for change themselves. This is important as it forms the basis for a new collaborative, community approach to change in schools. Similarly, as Moral et al. (2018) claim, principals are seen as professionals whose purpose is to look further at matters related to the curriculum and teaching, and who are unafraid of working directly with teachers to improve the teaching-learning processes, with a mixture of expertise and charisma. Bolivar et al. (2013), developed a leadership model, where principals do not directly guide the professional practice of teachers, but instead promote a shared, process-oriented leadership, aimed at creating collaborative projects based on professional learning communities. I would like to transfer to and adopt this type of approach in my leadership of this research as I believe it can provide highly valued outcomes for me as research leader and the wider staff community.

Research from McCoy et al. (2016) examined "Teaching and Learning in Irish Second Level Schools in the advent of High-Speed Broadband". They claim that the "attitude of school leadership towards the use of ICT in school is very influential in fostering the culture of ICT at the local school level" (McCoy et al. 2016, 24). A number of studies have been undertaken investigating leadership styles and characteristics of school head teachers/principals regarding ICT implementation (e.g. Chen et al., 2013; Hadjithoma-Garstka, 2011; Vermeulen et al., 2017). One study undertaken by Jogezai et al's investigated the influence of head teachers 'leadership styles on teachers concern about ICT integration in schools in Pakistan. Their findings are significant for my research, as they reveal that "it is essential to consider how teachers 'as primary implementers' perceive ICT integration facilitated by head teachers

when it comes to integrating ICT into teaching and learning"(Jogezai, Ismail, and Baloch 2020, 2).

Teachers' concerns on technology adoption or educational innovations represent their attitude or reactions to technology usage, which influence their willingness to implement technology in their classrooms (Liu and Huang, 2005). Otherwise, as Hall and Hord (2011), as well as Cheung and Yip (2004), argue, many innovations failed because teachers' concerns about these innovations did not get proper attention (Jogezai, Ismail, and Baloch 2020). Teachers require ongoing training and support if innovations are to be properly adopted and implemented by teachers. This is important in planning this study as it highlights the need to address staff concerns in a meaningful and comprehensive way.

2.4.10 Change - The role of Opinion Leaders

Masullo referred to the importance of the inclusion of "opinion leaders", who provide leadership, within a teaching staff, in the promotion of ICT integration. "Opinion leaders are informal leaders. They are members of the social system and earn the respect of others and serve as models" (Masullo 2016, 5). He stressed that the inclusion of opinion leaders in this type of research prevents the researcher from overlooking or misidentify potential technology leaders (Masullo 2017). Anderson and Dexter (2005), claim that although technology infrastructure is important, in order for educational technology to become an integral part of a school, technology leadership is even more so. They highlight the importance of the presence of some form a technology committee to promote "leadership and vision" in research. Such technology leaders can develop a school wide shared vision for technology, in collaboration with senior school leadership and ensure that the resources, coordination, and climate are in place to realise it. "Having a technology committee generally is an organizational mechanism for developing consensus on technology visions and for distributing the leadership function across different administrative and instructional staff" (Anderson and Dexter 2005, 58). Given the change process required by the adoption of ICT into teacher practice, as outlined by Anderson and Dexter, it will be essential to encourage and promote leadership within the staff. It will be critical to establish an "organisation mechanism" such as an ICT committee, from members of the teaching staff to support and promote the vision of integration of ICT into teaching and learning practices.

We live in a world that is characterised by abundant information, advanced technology, a rapidly changing society, greater convenience in daily lives and keener international competition. Therefore, it is important that all stakeholders are proactive and take a leadership role in identifying how ICT can enhance our education system, particularly in the areas of teaching, learning and assessment (Hallissy et al. 2013).

2.4.11 Change, Teachers Agency and ICT Integration

According to Fullan (2007), educational change is dependent on "what teachers do and think – it's as simple and as complex as that" (129). This is not to dismiss the role of other educational stakeholders but to highlight that changes in the student learning experience ultimately reside with teachers. According to Donnelly et al. (2011), when faced with educational change teachers are less likely to engage with policy instead, the most effective source of help for teachers tends to be other teachers. According to Tyack and Cuban (1995), teachers look towards resources, practical designs for change and collegial support in bringing about change. This collegial support provides opportunities for learning in a social constructivist way where social and collaborative activity enables teacher to create meaning to adopt change through their interactions with one another. "Ultimately, successful change processes require a bias for action i.e. conditions under which people become motivated to change" (Donnelly, McGarr, and O'Reilly 2011, 1469) Given this challenge, it can be concluded that there is a need for school leadership to work with teachers to discover a possible "bias of action" to enable their motivation to change. It is important to be realistic, however, and acknowledge that change can be slow and the adoption of ICT by teachers into their practice may take time. Zinger et al. (2017), note that "changing teacher beliefs and practices to integrate technology in student-centered ways takes an extended period of time" (586). Studies have shown technological pedagogy change is the resistance to change and inertia that frequently exists in the field of education (Cuban, Kirkpatrick, & Peck, 2001; Kinchin, 2012). "Additionally, the process of teacher change in integrating technology in the classroom in a meaningful way is complex and multi-staged" (Zinger, Tate, and Warschauer 2017, 586). Ertmer et al. (2010) state that

> *"it is time to shift our mindsets away from the notion that technology provides a supplemental teaching tool and assume, as with other*

professions, that technology is essential to successful performance outcomes (i.e., student learning" (Ertmer and Ottenbreit-Leftwich 2010, 256).

The reality is that, given the often independent role teachers have, their teaching style and practices have often developed within their classroom walls. Teachers level of ICT literacy and use will often dictate the degree to which ICT is used in their teaching. "Teachers' instructional practices prior to ICT integration into teaching are likely to affect how ICT is used in the classroom" (OECD 2018). This suggests that the more teachers use ICT in their practice the better chances there are that greater adoption and integration will occur. Greater adoption of ICT by teachers "can change teachers' pedagogical approaches and the learning experience of students in school"(OECD 2018). Integrating ICT not only changes the traditional ways of teaching, but also requires teachers to be more creative in adapting and customising their own teaching materials and strategies (Reid 2002). Castro Sánchez and Alemán (2011), concur with Reid that ICT assists in transforming a teaching environment from a teacher centred into a learner-centred one, since learners are actively involved in the learning processes (Lawrence and Tar 2018a).

Fullan (2007), refers to three dimensions of educational change. Burner (2018), in his research refers to all three dimensions which he claims must be present and interlinked to achieve real educational change. Firstly, when "new or revised materials are introduced such as curriculum materials or technologies" teachers are challenged with change. This can happen regularly for teachers and therefore they accept these changes even if they do not favour them. The next dimension of change encounters more resistance from teachers and that is the introduction of new teaching strategies or activities. According to Burner (2018), the third dimension is that of

"changing people's beliefs, for example assumptions and theories underlying particular policies and programmes"…."there can be little change if new materials are introduced without being followed by new teaching approaches, or if changes are articulated in terms of beliefs and values without actually understanding their implications for practice" (Burner 2016, 124, 2018).

What can be learnt from Burner's research for me in my study is that in introducing new and innovative approaches to teaching, it is important to do so through an ICT professional

development approach that demonstrates and provides teachers with a practical understanding of how to incorporate ICT into their practice and delivery. In the effort to encourage all members of staff to adopt change, research provides an important opportunity in seeking and encouraging the identification of opinion leaders. It also provides the opportunity to encourage staff to adopt the role of change agents. Change agents can help to encourage teachers to move out of their comfort zone and consider changing practice to include ICT. A change agent is "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (Rogers 1995, 27). According to Rogers 1995, change agents generally encourage adoption of a new idea. The role of change agents is to enhance the survival chances of initiatives for change, by supporting them, through various strategies, so that they become more effectively adapted and/or linked to their dynamic selection than other competing initiatives. Given that my research aims to work with teachers to improve their use of ICT in teaching and draws on the theoretical framework of diffusion of innovation, change agents could be crucial to making the process more successful. A change agent is someone who encourages an opinion leader to adopt or reject an innovation. The short-term goal of most change agents is to facilitate the adoption of an innovation (ou.edu 2022).

The change process in this research centres around teachers and their practice. I believe and understand that undertaking this research will be complex and dynamic. It is important to be realistic in approaching this research and realise that "change can succeed or fail, it can be good or a disaster" (Burner 2018, 123). However, according to research (Fullan 2007, Hall and Hord 2011; Rogers 2003), if change is approached in a procedural manner, the process of change can be understood. By adopting a change model, schools can be supported and guided in their efforts to implement change with a greater understanding the process involved.

2.5 Theme 2: Integration of ICT into Teaching and Learning

The term "ICT integration in education" generally refers to technology-based teaching and learning processes that closely relates to the use of learning technologies in schools. Given the digital world students today inhabit, students are familiar with technology and they, according to Ghavifekr et al. (2015), will learn better within technology-based environments, and so the issue of ICT integration in schools, specifically in the classroom is vital. Eady and

Lockyer (2013), suggest "the idea of integrating technology into the curriculum came about through a concern that we may have been teaching about and teaching how to use technology but not addressing how students can apply technology related knowledge and skills"(73). The growth of ICT has opened up a vast arena providing opportunities for the improvement of education, particularly in teaching, where teaching and learning can take place anytime and anywhere (Cradler & Bridgforth, 2002). Lawrence and Tar (2018), share this view as they claim that there is immense potential for teachers and students to harness the power of ICT to improve and enhance the quality of teaching and learning in the classroom. "With technology now being part of our everyday lives, it is time to rethink the concept of integrating technology into the curriculum and instead aim to *embed* technology into pedagogy, to support the learning process" (Eady and Lockyer 2013, 73). Studies undertaken to measure the impact of ICT integration on learning include (Castro Sánchez & Alemán, 2011; Chai, Koh, & Tsai, 2010; Lowther et al., 2008; Watts- Taffe, Gwinn, & Horn, 2003). Such studies have highlighted potential opportunities that can be gained from the integration of ICT in education in general, and particularly in enhancing teaching and learning activities. Findings from such studies include that;

> *"there is tremendous potential for teachers and students to harness the power of ICT to improve and enhance the quality of teaching and learning in the classroom. ICT offers a new paradigm shift in how education is delivered globally, and it is changing the face of education" (Lawrence and Tar 2018a, 79).*

The integration of ICT into teaching and learning provides students with a creative, collaborative learning environment and supports student-centred and self-directed learning. This is critical to why, through my research, I am addressing the student need to improve the use of ICT into teaching. If through the adoption of ICT into teaching, we can generate a learning environment that delivers such key skills, we will have greatly enhanced our student's experience of learning, which we will see will impact student achievement. However, despite the major benefits of ICT integration in teaching and learning, a number of studies have found that there are barriers to teachers adopting and integrating ICT into their teaching.

Researchers who have undertaken research as to why some teachers integrate ICT in their teaching while others do not, with the need to draw a fundamental distinction between the external and internal factors that can affect teachers' use of ICT in classrooms. Over the last

two decades of research, studies alike have shown that both external and internal factors can serve as barriers. External barriers to ICT integration are those that are external to the teacher and include lack of or outdated hardware, time pressures, lack of technical or pedagogical support. "Internal factors are intrinsic to teachers and include their beliefs about teaching and ICT, and classroom practices, as well as their unwillingness to change educational practices" (Eickelmann and Vennemann 2017, 734). According to researchers (Badia et al., 2013; Erdogan, 2011; Ertmer, 2005; Kubiatko, 2013; Kusano et al., 2013; Oye et al., 2014; Petko, 2012), these factors have shown to be prerequisites for the successful integration and adoption of ICT in schools. According to Eicklemann et al. (2016) teachers' attitudes and beliefs appear crucial with regard to innovations in schools, especially those that combine pedagogics and technology. This is important as before I can, through this research, progress with action research interventions, the focus must centre on working with teachers to understand their attitudes and beliefs and provide a collaborative environment where we as a staff can find solutions and create opportunities for combining pedagogy with technology.

ICT integration and Student Achievement

Integration of ICT in teaching enhances students' knowledge, investigation and inquiry skills and creates a curiosity and interest as information is available at multiple levels (CEO Forum on Education and Technology, 2001; (Mbugua, Kiboss, and Tanui 2015). "infoDev" was founded as an ICT-for-development research leader in 1995 by the World Bank to promote innovation and entrepreneurship in technology. The program outlines the claims from a range of researchers who believe that ICTs in schools can transform teaching and learning processes and improve strategies for academic achievement. According to Cener et al. (2015), the positive impact of ICT on pupils' achievement should be the reason why teachers must adopt ICT themselves and into their practice. However, given the barriers that exist for teachers regarding ICT integration Sang et al. (2011) and Blackwell, et al. (2013), claim it is not a straightforward process to help pupils achieve higher grades through increased use of ICT (Fairlie & Robinson, 2013; Acun, 2014). "Some studies suggest that if barriers to ICT integration are identified and properly addressed ICT could be a useful asset in every level of education" (Çener, Acun, and Demirhan 2015, 192). International research highlights that to improve student achievement, "it is not enough for schools to provide access to ICTs; they must also provide real opportunities to use the technologies as well as adequate quality of access" (Alderete and Formichella 2016, 87). According to the findings by infoDev.org and

despite the claims by researchers regarding the positive impact of ICT use in education, this positive impact has not yet been proven as the 'impact of student achievement remains difficult to measure and open to much reasonable debate." Cener et al. (2016) suggest that intensive use of ICT may not automatically bring about the success in pupils' attainment level in schools. The positive impact of ICT use on student achievement is more likely when linked to pedagogy, that is used appropriately to complement a teacher's existing pedagogical philosophies." (infoDev.org undated; infoDev.org) Findings that dispute infoDev.org claim regarding the lack of evidence relating to the positive impact of teacher integration of ICT were identified in research carried out in secondary schools in Kenya. Findings of the study d that integration of ICT in teaching did indeed influence students' academic performance (7). "The study found out that the teachers who did not integrate ICT in teaching at all had the lowest (4.16) KCSE mean mark…those who integrated ICT at moderate level had a better (5.61) KCSE mean mark and those who highly integrated ICT had the best (6.14) "mean mark" (Mbugua, Kiboss, and Tanui 2015, 12).

In a study carried out by Comi et al. (2017), evidence too is provided on whether ICT related teaching practices affect student achievement. Their findings suggest that the effectiveness of ICT at school depend upon the actual practice that teachers make of it and on their ability to integrate ICT into their teaching process. "It is important not to use technology for its sake, but rather to embed technology appropriately" (Eady and Lockyer 2013, 74). The significance of this for my research is that in order to increase the use of ICT in teaching it is necessary to focus on a teacher practice that can be changed or altered to adopt and embed technology. This then should lead to enhanced student learning experience. The analysis of results from Comi et al's study (2017) found that ICT per se is not necessarily beneficial for student learning however "computer based teaching practices" increase student performance. It is these practices that are aimed at and are highly valuable in increasing students' awareness of ICT use and at improving their navigation critical skills, developing students ability to distinguish between relevant and irrelevant material and to access, locate, extract, evaluate and organise digital information.

Many schools have approached ICT integration by investing in student devices ranging from iPads to tablets. However devices on their own will not increase student learning if they are not accompanied by developing teachers' technological and pedagogical skills. Real

investment is necessary in providing ICT professional development teacher training which will encourage increased use of ICT in teaching so that students will benefit in their learning.

> *"A prerequisite to effective school technology integration programs is teacher professional development at the outset and continuing through the implementation of the innovation. Such organizational learning is influenced by leaders, and is facilitated by leaders who encourage creative ideas, nurture promising practices in their initial stages, provide resources needed to develop new ideas, encourage experimentation with new approaches, and use reflection to analyse new processes (Yukl, 2009)" (Liu, Ritzhaupt, and Cavanaugh 2013, 577).*

2.6 Theme 3 - Teacher ICT Professional Development

"With the emergence of rapidly changing technologies, it must be borne in mind that it is not only learners who need to learn new skills and new knowledge practices (Karchmer *et al.*, 2005) but also educators" (Mirzajani et al. 2016, 27). The research question, for this study, originated from students' needs to experience increased integration of ICT into teaching and learning in our school. To achieve this it is critical that, through this research, teachers are given the opportunity to develop current and new ICT skills through ICT continual professional development (CPD). Ohlin (2019), highlights the types of CPD required in education today. He states that it should be "dynamic, ongoing, continuous, and set in teachers' daily lives, embedded in the classroom context, directly related to the work of teaching" (Ohlin 2019, 45). He proposes that there are differing formats CPD can take from "co-teaching, reflecting on actual lessons or group discussions, and constructed through experience and practice. In addition, a further kind of CPD, one advocated by Guskey, (2000) is involvement in a development or improvement process. In terms of this research and because the focus is on improvement, it is important that the selection of a professional development approach will incorporate what Guskey advocates.

Findings from previous researchers referred to by Bendtsen et al. (2021) such as Porche, Pallante, and Snow (2012), claim that CPD with sustainable results tends to be built on collegial learning, where teachers engage in efforts intended to show measurable changes in students' results. "Timperley et al.(2007), identified successful CPD as collaborative, systematic and long term, building on school-based activities, observations of each other's

teaching, mutual reflections of observed teaching and containing input by external expertise" (Bendtsen, Forsman, and Björklund 2021, 1) This form of CPD will require active engagement by teachers in their learning in a social context, to construct and apply new knowledge together, a contrast to the traditional approach to professional development

Matherson and Windle (2017), suggest that even though great strides have been made in enhancing the professional development opportunities for teachers, a discrepancy still exists between what is offered and what they really want from their professional development. They refer to the "sit and get" professional development of the past that they believe, should be a thing of the past. In 2009, Darling-Hammond et al. undertook a study in the U.S., which produced results that 90% of the teachers who participated in "sit and get" professional development sessions, found that it had no impact on teacher pedagogical practice or student learning. According to Malone and Smith (2010), research is advocating a move away from the traditional approach to professional development "towards a professional development model that is ongoing and gives teachers opportunities to: collaborate with their peers sharing practices and knowledge; reflect on their pedagogic practices; and focus on student learning and influence decision-making" (Malone and Smith 2010, 107).

If teachers are a key implementers for integrating ICT into the education system they need to be fully trained to feel confident about using ICT. In addition teachers need to be trained in both the technological and pedagogical components because both are essential for using ICT in classrooms (Ertmer and Ottenbreit-Leftwich 2013). "Consequently, this means acquiring technological and pedagogical knowledge and skills in ICT, which will allow teachers to integrate these technological resources into their teaching practice" (Suárez-Rodríguez et al. 2018, 1167).

Dlamini and Mbatha 2018, produced a study on

> *"ICT Teacher Professional Development needs: The case of a South African teachers' union" state that "the prevalence and adoption of Information and Communication Technology (ICT) tools in education has often been guided by utopian perspectives without proper research to understand the schooling context and teachers' development needs" (1).*

Their research produced data from a survey undertaken with South African teachers. It used an analytic framework that examined a number of internal and external school factors in an attempt to understand teacher union members' preparedness to integrate ICT tools into their

teaching practice. The results of Dlamini and Mbatha's study are informative, they highlight the important need for teacher ICT professional development to integrate ICT into their teaching and learning and stress the importance of the role of school management and administration, as reviewed earlier, in the adoption and integration of ICT into teaching and learning. Their study "provided clear evidence that despite the huge investments into ICT infrastructure by government, inequalities in ICT competencies among teachers remain"(Dlamini and Mbatha 2018, 17). Education in Ireland has faced similar issues and challenges with ICT adoption and integration in education. Despite substantial investments made by the Irish government, such as the €210 million provided for under the Digital Strategy for Irish Schools, there is still largely a "sit and get" approach to teacher ICT professional development in Irish secondary schools today. Mulcahy - O Mahony (2013), in her study on the "The Development of a Model of Continuing Professional Development for Teachers of Primary Science "found that teacher respondents from the Irish secondary school system did "not validate the use of CPD time for research or subject" specific training "and preferred to go straight to the workable ideas for classroom practice. This she claims is evidence that they have come to associate CPD with the "one shot sit and get" programme" (Mulcahy-O'Mahony 2013).

"A shift in professional culture is needed to bring about a more balanced approach between professional development that supports needs of the system and that of the individual. Shifting professional culture is a complex and long-term process" (Smith 2014, 485). The challenge now in Ireland and other countries is to address ICT integration both pedagogically and technically into teaching and learning. Findings from 2016 UNESCO study on ICT indicators in education systems reveal gaps in the digital skills of teachers and students suggesting that this is a clear sign that schools are not yet ready to leverage the potential of technology (European 2019). This is significant to my research as it first highlights that the use of ICT by teachers in their teaching is not an isolated problem for our school. The gaps in digital skills of teachers are an issue across the education system, particularly with the increased demands of the use of ICT in education. It is clear that to achieve increased use of ICT by teachers in teaching, my research will need to identify what gaps exist within the teaching staff ICT skills so that a sufficient scaffolding can be put in place to enable all teaching staff to "leverage the potential of technology".

Findings from the 2nd Survey of Schools: ICT in Education carried out by the EU commission (2019), indicate that today "students and learners expect more personalisation, collaboration and better links between formal and informal learning, largely supported by digitally supported learning"(European 2019). In conjunction with preparing students for the current digital era, teachers are seen as the key players in using ICT in their daily classrooms. This is due to the capability of ICT in providing dynamic and proactive teaching-learning environment (Ghavifekr et al. 2014). The need for ICT integration in education is crucial, because with the help of technology, teaching and learning is not only happening in the school environment, but also can happen even if teachers and students are physically at a distance. The arrival of the pandemic in 2019 reinforced this very need. This led to an additional theme in my research which is discussed following this section. Prior to this "the process of adoption of ICT" was a slow ongoing and continuous process that fully support teaching and learning and information resources.

As a lack of ICT teacher professional competences has been found to constitute a hindering factor to the integration of new technologies in school, the professional development of teachers has the potential for taking countermeasures (Drossel and Eickelmann 2017). For many teachers the problem of ICT competence has been a barrier in providing and imparting essential ICT skills for student learning. The practical use of ICT for learning requires teachers to have specific skills and know-how regarding the learning process and classroom management with digital tools (OECD 2018). Training for teachers in all areas of digital skills is a clear requirement for an effective adoption of digital technologies in classrooms. The purpose of teachers' professional development is to enhance their classroom practices for better performance of their learners" (Ajani 2019, 195). Educational policy-makers and designers of professional development programs should emphasize collaboration as a crucial component of school ICT culture (Drossel, Eickelmann, and Gerick 2017) promoting the importance of the social context for knowledge construction. According to the OECD 2009, effective professional development includes training, practice and feedback, and provides adequate time and follow-up support. The use of observation is also a necessary tool to provide feedback to colleagues in a professional way. According to Malone and Smith 2010

> *"to meet the emerging needs of this knowledge/learning society, schools and teachers are being challenged to turn schools into "active learning communities" for teachers and students in which develop their skills, knowledge and attitudes needed to become lifelong learners in such a society. This requires a different and expanding role for teachers: (1)*

> *adaptation to new technologies; (2) use of a wide repertoire of teaching styles to suit the various learning styles; (3) collaboration with fellow professionals; and (4) reflection on their classroom practices" (Malone and Smith 2010, 106).*

In this Malone et al. (2010) highlight the changes required in schools and the need for active engagement for teachers and students in order to develop a culture in schools that challenges the traditional methods of teaching and learning and emphasizes the importance of the social context for learning within schools and the need for reflection on practices. Glazer et al. (2005), in carrying out research on teacher ICT professional development to promote technology integration identified as the Collaborative Apprenticeship Framework. Glazer et al. (2005) claim that effective technology integration requires teachers to obtain learning experiences within the context of their teaching so they can practice, reflect and modify their practices. Central to their approach is the teachers learning in a teaching community, during the school day, which is a social process which involves ongoing, on-site, and just-in-time support. The adoption of this model to research such as mine provides the broad framework which combines all the requirements identified as key components to effective ICT professional development. It centres on collaboration and promotes the learners to engage with each other, in a social constructivist approach, in transitioning from novice to expert within the collective setting. The collaborative apprenticeship model is based on Collins et al.'s cognitive apprenticeship model (1989). "Collaborative apprenticeships feature reciprocal interactions between peer-teachers and teacher-leaders"(Glazer, Hannafin, and Song 2005, 59).

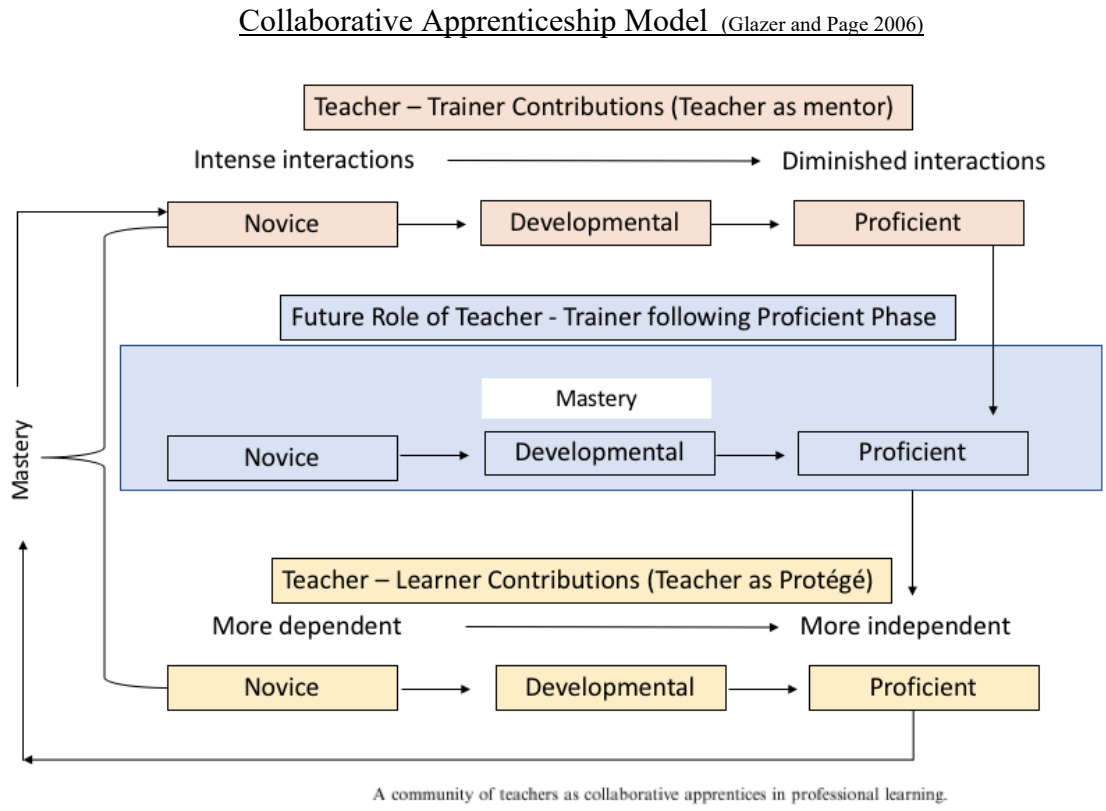


Figure 4 . Collaborative Apprenticeship Framework – Community of Teachers

This model (Fig. 4) illustrates the process where novice teacher learners, as a result of knowledge transfer, in a social context, move through four progressive phases to finally achieve master (expert) teacher learners. Their early interactions with the teacher trainer are frequent and intense. The frequency and intensity of these interactions diminish as the learners, through collaboration and social interaction, construct a level of knowledge which enables them to reach the proficient phase and move into the expert phase. The teacher trainers provide training directly in the early stages of the process, with dependency on them high. By the fourth stage of the process their role has become facilitational with little or no dependency and very little support required by the teacher learners. This framework also ties in the theoretical framework I have incorporated in my research, the diffusion of innovations. Not only is knowledge being diffused through this professional development model but also the diffusion of an innovative approach to teacher practice. According to Glazer et al. the implications of the Collaborative Apprenticeship model for technology integration are three-fold: (a) building communities of practice for teachers at schools; (b) developing strong leadership on technology integration; and (c) supporting teacher empowerment. Once this model is applied in schools it helps to build a community of practice among teachers

integration technology which in turn enhances the impact of the model in practice (Glazer, Hannafin, and Song 2005). This model of ICT professional development offers my research an opportunity to deliver ICT training in a new way which instead of teachers receiving a "sit and get" or "spray and pray" form of professional development they now get a chance to actively participate in a "learn and grow" experience and together construct their knowledge and expertise as a community of learners. According to Reimers & Chung (2016), despite the need for innovative professional development, most teacher development remains driven by outmoded models that lack long-term improvements. Why is this the case? In her research Krasno (2015), points out that it is not hard to imagine why schools favour "spray-and-pray" or "sit and get" professional development workshops even if they know they aren't particularly effective, given that they are easier and generally cheaper than reorganizing school schedules, extending the school day, or hiring additional staff to free up the common time for this type of professional development" (Krasnoff 2015, 12).

2.7 Introducing an additional Theme to this Review

My original focus in this Literature Review was to examine the themes arising from my examination of literature that related to my research focus and research question. This was the pathway that I had planned to examine and research. However in the early phase of the research the Global pandemic that is COVID-19 arrived on our shores and this prompted the re-orientating of my research. The impending and subsequent closure of schools by the Irish government in an effort to halt the transmission of COVID-19 in communities, gave cause for prompt and urgent action to prepare teachers to transfer their teaching online. Given the impact of COVID-19 on my research, I have added this addition review, detailing the impact of the crisis on ICT integration, adoption and the sudden impact which required teaching and learning to transfer, almost overnight, to online platforms.

2.8 Theme 4 -The Disruptive COVID Crisis

In March 2020, in response to the rapidly progressing Covid-19 pandemic, schools across the globe began to close. Country-wide closures were in place by 1 April, in 193 of the world's 195 countries, resulting in drastic and abrupt changes to the nature of school education for an estimated 1.6 billion learners (UNESCO Institute for Statistics, 2020). This "disruptive crisis" gave educators time to rethink the importance of ICT on their sector as they saw

technology step into the breach. Teachers and students became immersed in a world where knowledge was a mouse-click away (Li and Lalani 2020). In these unprecedented circumstances, teaching and learning transferred online, and "thus the use of technology, in particular cloud-based software and services, became a necessity overnight" (Scully, Lehane, and Scully 2021, 2).

In an Irish Times article, Ó Caollaí (2021) examined "how online learning affected Irish secondary schooling". In his findings he claims that teachers using Edmodo, Google Classroom or Microsoft Teams might have found it easier to manage online teaching but, pre-pandemic, a lot of schools failed to have a learning management system in place and were therefore confronted with a series of challenges in providing teaching and learning online. Another article titled "24 hours that changed everything: An oral history" published in the journal.ie by their reporter team, provides evidence of the confusion experienced by one teacher in an Irish school as a result of lack of ICT planning and integration;

> *"The days prior to school shutdown I think it was a case of everyone grabbing what they could and went. Some schools for a week or two before that had been told about online teaching and had got training whereas I think most teachers didn't and I think everyone left on the Thursday … you know, in a way, it was almost like the snow days when they come, you get three days but then the snow melts. But this was very different, and just highly different, not knowing when, how, where you were going to go back – and I suppose also having to realise that you're going to have to find some other way to teach them online" Ann Piggott (Teacher)(2020).*

This clearly highlights that while schools in Ireland had "developed ICT plans as part of their whole school planning (McCoy et al., 2016), such plans were unlikely to have envisaged a scenario like this" (Mohan et al. 2020, 2). Prior to COVID-19, Fullan (2020) writes "Without question, education systems were in a state of stagnation before the onset of the Covid-19 pandemic. It was clear that schools increasingly were not serving the needs of most students and they were not preparing them for the 21st century" (Fullan 2020, 26). What would have taken years to achieve regarding ICT adoption, occurred almost overnight as schools transferred teaching and learning to various online platforms. Ó Caollaí (2021), reports, significantly, that collaboration between teachers proved important, although unequal access to technology, for both teachers and students, was a problem. Additionally "we saw more of a community spirit with teachers sharing resources. There was a real community of practice in schools" (Ó Caollaí 2021). This was an unexpected but welcome outcome of the transfer to online education. However, with this sudden shift away from the classroom in many parts of

the globe, some educators are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market? (Li and Lalani 2020). Some innovations worked well, and some of these will likely remain. According to Fleming (2021), it would seem that investors certainly think so. “Global investment of venture capital in edtech more than doubled from $7bn in 2019 to a record $16.1bn in 2020” (Fleming 2021). While some commentators according to Li et al. (2020) believe that the unplanned and rapid move to online teaching and learning, with little or no training and little preparation, “will result in a poor user experience that is unconducive to sustained growth, others believe that a new hybrid model of education will emerge, with significant benefits.” There are concerns however according to Fleming (2021), who highlights that a “digital divide” further widens because of online education impacting existing attainment gaps and inequalities faced by disadvantaged children. Research published by Maynooth University on the impact of COVID-19 and school closures also supports this issue of gaps and inequalities identified amongst its findings that despite “the pandemic is reshaping education; the impact is not equal for all participants” (Social-Justice.ie). Not all teachers have the skills for online teaching nor do all schools and pupils have the hardware and software for distance learning. “The survey results highlighted a clear digital divide (hardware, software, & technological skills) that exists across schools in Ireland” (Social-Justice.ie).

The pandemic changed the course of ICT integration in schools. Prior to the arrival of COVID-19, schools were at various stages of ICT integration. Following the global shutdown of schools and the urgent transfer to online teaching and learning, the pace of ICT integration accelerated significantly. Luthra and MacKenzie (2020), suggests that the outcomes of this disruption provides the opportunity to “get us all to rethink how we educate, and question what we need to teach and what we are preparing our students for” (Luthra and Mackenzie 2020, 2). Wang Tao, Vice President of Tencent Cloud and Vice President of Tencent Education provides his insight into the future of online education; “I believe that the integration of information technology in education will be further accelerated and that online education will eventually become an integral component of school education” (Li and Lalani 2020, 4).

2.9 Conclusion

Through this literature review I have provided an analysis of research carried out relating to the subject of my research which is improving the use of ICT by teachers in their teaching. In examining literature relating to this subject, I identified three themes which are central to my research. I have examined the role of change and how change must begin at the organization level before it can lead to change at an individual level. The relationship between leadership and change were examined and the importance of a bottom up approach to change for this study explored. The importance of teacher agency and change outlined. The need for a focus on working with teachers to examine their beliefs and attitudes to ICT adoption through collaboration in an effort to identify opportunities in practice that could lead to ICT integration. This review of literature has provided evidence of the importance of incorporating key aspects of my chosen theoretical frameworks. It has shown that ICT professional development today must focus on teachers learning together in small groups, socially constructing and diffusion knowledge. The diffusion of knowledge regarding new innovative ICT practices is supported by incorporating aspects of Roger's theory, change agency, change agents and opinion leaders.

Chapter 3: – CURRENT CONTEXT

3.1 Brief outline of this Chapter 3

Before moving into the action research phases of this research, action research prompts us to ask two questions;

1. Where are we now?
2. How did things come to be this way?

Therefore in this short chapter I will summarise what prompted this research and the early initiatives undertaken to give the reader some sense as to where we currently are and how it came to be this way.

3.2 Where are we now?

Prior to undertaking the reconnaissance phase of this research, it is important to provide the reader with some important background information regarding the current status of ICT in our school.

The school has currently adopted a new school ICT framework, Office 365 and following a year of the roll out of this framework, all teachers have received training in the Office 365 tools of Outlook, OneDrive and Teams.

3.3 How did we get to this point?

In 2018, as a senior school leader, I had a growing awareness that there was a decline in the use of ICT by teachers in their teaching. This awareness came from my general observations and from casual conversations I engaged in with teachers during break times. I have been a strong promoter of ICT in our school for almost thirty years. I decided, in collaboration with the principal, to conduct a Leaving Certificate Student Experience Evaluation Survey (see Appendix A) in April 2018, to gather feedback from students of their various experiences in

school of teaching and learning. The results of this survey indicated that there was a problem. Students indicated that there was very little use of ICT in teaching and this had impacted negatively on their learning experience in school. As one student claimed;

> *"IT level in this school is very low compared to others. I feel like it could be changed into a more advanced school that would help us learn more by using modern technology". Student 1*

Following analysis of this survey, I presented the results at the following staff meeting in May 2018. Teachers were keen to address this problem. They pointed to the need for the school to consider adopting a new ICT framework that would provide students and teachers with the digital capacity to communicate, collaborate and support practice. Teachers proposed that they form a committee to investigate the options for a new school ICT framework. Six teachers volunteered to form an ICT committee under my leadership. The ICT committee undertook a period of reconnaissance to establish what ICT framework would suit our school needs and following visits to other schools and meetings with teachers in these schools, we decided to adopt Microsoft Office 365. Office 365 was compatible with our school administration system VSware and many of its tools, Word, Excel etc. were familiar to a number of members of staff.

In September 2018, the ICT committee made a plan to roll out the tools of Office 365 over the next school year. They would provide teachers with training in Outlook, OneDrive and Teams and support their colleagues over the course of this year.

3.4 Preparing to move to the Collaborative Action Intervention Stage of this Research

In September 2019, following one year of the roll out of Office 365, I planned to move to the reconnaissance phase of my research. In undertaking collaborative action research, I needed to form a committee who would be interested in working with me on this research. I decided to approach the ICT committee to see if any of the members were interested in volunteering to join me on this committee? I was delighted when five of the six members volunteered. This committee would be referred to as the collaborative action research committee (CARC) from here on in my research.

3.5 Conclusion

This chapter has outline the process from where I identified an issue regarding the declining use of ICT by teachers in their teaching to the implementation by a new ICT committee of a new ICT framework, Office 365 in our school. The roll out of this framework was undertaken in the school year 2018 to 2019. At the start of the new school year in 2019, I believed it was time to undertake a period of reconnaissance which would inform the direction of my research. Before I could do this I looked for volunteers to join me in a collaborative action research committee. I was joined by five teachers, who had previously been members of the ICT committee. We were now ready to begin the reconnaissance phase of this research.

Chapter 4: - RECONNAISSANCE

4.1 Brief overview of this Chapter 4

The following chapter outlines the reconnaissance phase I undertook to identify how we could approach addressing the issue of declining use of ICT by teachers in their teaching. It begins with the first meeting of my collaborative research committee (CARC). It follows the steps of a teacher ICT survey (TICTS) we undertook, which was followed by a validation focus group meeting of volunteer teachers to help us to clarify and uncover the key components that would enable us to undertake a series of action interventions (see Appendix B). Following this meeting we established clearly our research question and planned our action interventions.

4.2 Collaborative Action Research Committee Meetings – September 2019

At our first meeting of CARC, I suggested that we carry out a Teacher ICT Survey (TICTS) (see Appendix B), that would provide us with a detailed insight into current ICT practices and possibly provide ideas on how staff might like to move forward in improving their use of ICT in teaching. From the review of literature, it was clear we would need to develop interventions that focused on ICT professional development to achieve ICT integration, as according to Liu et al. (2015),"a prerequisite to effective school technology integration programs is teacher professional development at the outset and continuing through the implementation of the innovation"(p.577). Traditional practice of ICT professional development has all too often been instructor led, imparting knowledge in a primarily didactic manner in a model of professional development referred to as "sit and get' by Matherson et al. (2017). This model they say is a model of the past and "must become a thing of just that...the past" (Matherson and Windle 2017, 28). Identified in my Literature Research, this model was important in informing my research.

In addition any new approach to professional development according to Korthagen (2017), should not be a one-shot approach or follow a 'one solution for all' strategy. Johnson (2016), found that "the real development of teacher skills for most teachers in the U.S. is "on the job" or "learning by doing. Job-embedded professional development through teacher

collaboration is becoming a more significant factor in more and more school systems worldwide" (Johnson 2016). Another important example of how my Literature Review informed my research. Johnson's findings support a claim by Evan (2014) that teacher professional development must not be merely an isolated experience but a social interaction (Evans 2014). The synthesis of these various researchers suggest to me that that for this research, the model of professional development chosen will need to focus on teacher learning in a social setting, social constructivism, where teachers learn together by doing, in collaboration with each other.

4.3 TICTS – Teacher ICT Teaching Survey

We undertook this survey in September 2019 (TICTS) (see Appendix B) and sought feedback from teachers on their current ICT competencies, how teachers used ICT in their practice and how they would like to progress with building their ICT skill knowledge so that they can increase their use of ICT in teaching.

4.4 Staff Survey Results – September 2019

The survey provided the committee with a range of data. To start with teachers were given a series of statements relating to their current use of digital technologies. The first significant result arose from this question where approximately 80% of teachers answered "yes" to the statement that "Digital Technologies (ICT) is integrated in my subject because I choose to do so". Even though this does not detail how ICT is integrated into a subject it does indicate that the majority of teachers were using ICT in their subject suggesting changes in practice are occurring in their classrooms. A disappointing but important result was that 20% of teachers indicated that they chose not to integrate ICT into their subject. This is despite one year of a roll out and staff training in the tools of Office 365. However, this result does not mean that this group of teachers have not adopted ICT into other aspects of their practice. This appeared to be the case given the next set of results that indicated that 95% of staff had signalled that they had adopted ICT into activities related to communication, collaboration, preparing and sharing resources, activities, not necessarily directly related to classroom teaching. This was promising as it was an indication that teachers were becoming comfortable with using ICT, but not all were ready to directly integrate it into their classroom practice. Another important result provided evidence that two key classroom practices of setting homework (49%) and

carrying out project work (20%) had the least level of ICT integration by teachers. The two aspects of Office 365 that provide teachers with the opportunity of engaging students in homework and project work are Teams, in which training had been provided, and OneNote which had yet to be rolled out to staff. We realised that different learners learn at different rates and therefore we were realistic that not all teachers will adopt ICT at the same time or with the same enthusiasm. Rogers indicates how diffusion occurs at different rates amongst people and categorised the stages of adoption in his diffusion theory. These categories are innovators, early adopters, early majority, late majority and laggards. The results from this survey indicated we were making progress along this adoption line.

For the committee, the results from this survey provided evidence that there had been an improvement in the twelve months regarding teacher use of ICT, if not in class, but by teachers in their general practice. We were aware that survey results was based on the self-professed opinions and views of teachers and were therefore keen not to over emphasise the progress made to date. The training provided in Office 365 had, because of time only focused mainly on the delivery of technical knowledge on how to use the Office 365 application.

Teachers were also asked to select what type of ICT professional development they would be interested in participating in? From the list of eleven options the three areas selected by teachers were (1.) 87.2% - Learning about pedagogical use of ICT in teaching and learning, (2.) 89.4% -Teaching and learning applications such as Teams and (3.) 93.6% receiving training provided by school staff. With so many staff showing interest in these three areas, all relating to ICT professional development, I was clear that our research interventions should concentrate on involving members of our staff, members of CARC, who had the expertise and motivation to deliver aspects of ICT Intervention training which would be focused on one or more Office 365 tools applied to some aspect of pedagogy.

4.5 A Further Opportunity to Validate Staff Survey Data – November 2019

I advocated, given the importance of the data we had collected and the need to be clear on what staff were indicating in these results, that we, the CARC, hold a participant focus group meeting with a staff volunteer group to clarify and validate our understanding and analysis of

the data gathered. The committee agreed and 8 staff members volunteered. These volunteers comprised of six women and two men. They ranged in age from 20s to 50s, a good representative group , we believed, from the teaching staff.

In holding this participant focus group, I explained to the volunteers that we were holding this meeting to gain further clarity and add to the staff ICT survey data set. I explained that this would enable me and my CARC colleagues to establish how best to proceed with working with teachers to improve their use of ICT in teaching. For the purpose of reporting on exchanges during this validation focus group discussion, I identified three key areas that were central to future research planning.

These were

1. Factors relating to the integration of ICT into their teacher practice.
2. How our teachers were using ICT in teacher practice.
3. How to progress our teachers use of ICT in their practice.

4.6 Findings from Validation Focus Group Discussion

The following is a detailed exploration of discussion undertaken and the finding that resulted.

1. Factors relating to the integration of ICT into their teacher practice

Our first aspect of discussion focused on the factors relating to the integration of ICT into their practice. The focus group seemed to feel that most teachers were encouraged to integrate some aspect of ICT into their practice, in and outside the classroom. Examining the 80% rate relating to teachers using ICT into their subject because they chose to, the group suggested that one factor relating to this result may be connected to what teachers understood by the term “ICT”. They reflected that for many teachers, ICT is anything from using the video player to a digital projector in the classroom and this is possibly why so many teachers believed they were integrating ICT into their teaching practice and hence chose this option in the survey. The group felt that this figure was greatly inflated. They referred to their own use of ICT and of what they knew from colleagues of their use of ICT in teaching and

believed that teachers were still at a very early stage of using ICT and in particular Office 365 in their teaching. They did however suggest that teachers were using ICT for out of class practice such as communicating via email, preparing tests or creating notes to support student learning. In relation to their need to increase their use of ICT in teaching the group wanted to highlight one factor that was raising concerns for them. The growing requirement to integrate ICT innovatively into practices associated with the new Junior Cycle Reform was a challenge for them. They explained that to effectively undertake these practices teachers would need to have a proficient level of ICT competency in particular, to undertake classroom-based assessments (CBAs) in innovative ways with their students. This, they identified, was a challenge for all teachers and something this research could address. Another factor relating to the integration of ICT into teaching practice was the limited access teachers had to ICT in school. The group believed this hindered advancement of their use of ICT in their teaching. Even though each classroom had a PC, staff could only access this PC when timetabled for that classroom. They suggested that consideration should be given to investing in portable staff devices as this would encourage and support greater use of ICT by teachers in all their practices.

2. <u>How our teachers were using ICT in teacher practice?</u>

The second aspect of our discussion related to how teachers use ICT. From the responses to the Teacher ICT survey (TICTS), there seemed to be considerable use of ICT by teachers in out of class practices while very little use in class contact practice (see Appendix B). When asked to comment on this, teachers offered their following views;

> *"I've enough things to do when teaching my class without adding more to it with ICT"*
>
> *"I would use ICT in my class, what type I won't tell you, but mainly I don't see the need to use it when I have my whiteboard to do all I need to do in my teaching"*

This showed how some teachers were reluctant to transition from their traditional teaching methods. However, one of the teachers who made one of these comments added that "some days I have regretted that I haven't taken time or even been confident in my own skills to put a reminder regarding a class test on Teams". This suggested that there were aspects of ICT, and in particular Teams, that teachers, despite being entrenched in their traditional approach

to teaching, were discovering were advantageous to their practice. It also highlights the issue of teacher confidence in using ICT in the classroom and the barrier this is to advancing ICT integration in teaching. We examined the issue of, if and how staff were using ICT to set homework, a finding highlighted through the data analysis indicating that assigning homework was one of the ICT activities teacher engaged the least in. There were issues raised regarding trust, student access to Teams from home and out of school notifications from students relating to homework assignments. One teacher explained she did not trust students to check homework through Teams and preferred the use of the student journal. Another teacher explained how her students had communicated the fact that parental control at home meant they were unable to access their device while doing homework. Another teacher noted how receipt of notifications from students during her personal time after school was not something she welcomed or encouraged. The issue of the need for teachers to learn how to use ICT pedagogically in their teaching was raised. One volunteer said "I may know how to use Teams from a technical point of view but how do I actually integrate it into my teaching practice so that students will benefit most from it?" Up until now professional development in our school had focused mainly on the technical aspect of ICT use. The volunteers exchanged views on this issue and suggested that there is a real need for teachers to understand how to use ICT pedagogically, as well as technically. This feedback was important as it highlighted that there was a clear need in planning our professional development training to focus on the technical and pedagogical aspects of any new ICT practice.

3. <u>How to progress our teachers use of ICT in their practice?</u>

The third aspect of this focus group discussion related to examining how to progress with improving staff ICT competency, which would result in improved use of ICT in their teaching. Focus group participants pointed to the fact that within their staff group there was a variety of ICT abilities. Staff would need professional development training but not as they had received in previous training sessions. Volunteers recollected that their experience of ICT training had been mainly trainer led, where the trainer gave instructions and the teachers followed these, in a very didactic way. "It was a case of we listened and followed instructions." One staff member made it very clear on how she felt about previous ICT training sessions when she said "I can't listen any more". She explained that a new approach needed to have a more interactive approach where teachers actively engaged in learning

together on how they could use the new ICT skills in their teaching and adapt it to meet their own needs, subjects and circumstance Based on the conversation in the focus group it was clear the tradition of "sit and get" ICT professional development was no longer wanted or acceptable by staff. They suggested we needed a major reform of ICT professional development in the school. The need for an approach that was set in a social setting where teachers engaged with each other in shared learning pointed to the need for us to consider the theoretical framework of social constructivism. This framework would support a small group format where teachers could learn and work together, possibly on an ICT task and share ICT knowledge and skills to complete the task. This approach would be intentionally inclusive as each teacher would have some skill or knowledge to share with their group. The idea of groups based on departments was suggested and volunteers liked this idea. One teacher in particular said that as she has limited ICT skills and works in a department where her colleagues have expert ICT skills. She felt a sense of isolation and was not able to share resources with her students to the same level her colleagues do. By working in a department group she believed she could learn from her colleagues in a supportive, professionally nurturing environment.

4.7 Reviewing outcomes from Validation Focus Group Meeting – December 2019

On reviewing the data gathered and clarifications gained from the participant focus group meeting we, the CARC members, were now ready to consider how this information could shape our approach to progressing with my research. Following our review, we identified three outcomes that gave clarity to how we should proceed. These were;

Outcome 1 – The selection of a teaching practice that would provide a targeted opportunity to integrate ICT into their teaching, possibly CBAs.

Outcome 2 – The selection of an ICT tool from Office 365 that we could adopt and integrate into the selected teaching practice in outcome 1.

Outcome 3 – The identification of a new form of in-house ICT professional development to meet the needs of teachers. These needs are that the approach be small group focused where

teachers could learn and share skills with each other, in a socially constructive ways, with the aim of increasing confidence, competence and integration of ICT into their teaching.

4.8 Selecting an appropriate Professional Development Framework

In undertaking my review of literature, I identified an article by Glazer et al. (2005), which was titled "Promoting technology integration through collaborative apprenticeship". I shared the key aspects of this article with my colleagues in CARC. In this article, Glazer et al. referred to the ineffectiveness of "intensive seminars" relating to ICT integration in schools. They claim that "learning in a teaching community is a social process that involves ongoing, on-site, and just-in-time support. Teachers need avenues to continually interact to provide such support across all members of the community" (Glazer, Hannafin, and Song 2005, 1). The proposed collaborative apprenticeship framework as one example of professional development that promotes technology integration within a teaching community. I suggested that this framework appeared to satisfy a number of conditions staff had highlighted as being important in future ICT professional development. Collaborative apprenticeships feature reciprocal interactions between peer-teachers and teacher-leaders" (Glazer, Hannafin, and Song 2005, 59). This framework focuses on small group professional development that enables teachers, who were novice in an aspect of ICT practice, to transition to experts through the process of instruction, in a social setting. It also incorporates within this learning process a transition of trainers to facilitator. The committee were satisfied that this approach encompassed what staff had requested in their survey and through the participant validation focus group meeting.

We discussed the extent to which the focus group had referred to CBAs during the meeting. This relatively new teacher practice was leading to some anxiety amongst teachers. CBAs can be referred to as a new practice for teachers or a new pedagogy. The format of CBAs provides an excellent opportunity for ICT integration as all teachers are required to undertake CBAs with their Junior Cycle students. By creating interventions around the integration of ICT to CBAs, this research would provide teachers with a meaningful strategy to innovatively undertake their CBAs with their students. We discussed possible suggestions which would provide us with a focus for the creation of interventions, relating to CBAs, for this research. A committee member noted how she had used Teams and OneNote in

undertaking her English CBA the previous year and found success in combining these two tools to undertake CBAs with her students. This was a suggestion we all seemed to think could provide us with the opportunity to expand teacher knowledge of a further Office 365 tool and integrate it into a practice teachers were feeling challenged by. In addition and importantly for our research, the fact that she had piloted the combined use of these tools with her students to carry out CBAs provided us with confidence that it was a strategy we could adopt.

We next examined what CBAs were upcoming? We also looked to see which of these CBAs were due to be undertaken by subject departments for the first time. We identified the 2nd year Mathematics and Geography CBAs and agreed that we would invite the teachers from these departments to participate in the research interventions.

The CARC members in discussions about preparing for carrying out these interventions suggested the need to have a demonstration of how the member had previously used Teams and OneNote to undertake her CBAs. This would not only enable them to view how to use OneNote technically, but also provide CARC with a potential guideline to how they would consider delivering training in the interventions from a pedagogical approach. I suggested that we invite one member, who deemed themselves as having a good level of ICT competency, from the Mathematics and Geography department to this demonstration. In doing so we hoped to encourage the inclusion of possible opinion leaders. Opinion leaders are "those individuals whom others emulate and go to for advice – in the process of adaptation and implementation may improve outcomes" (Reiger et al. 2017, 1). As schools are "complicated systems" in which it can be difficult to introduce, implement, and sustain evidence-based programs they may consider identifying and inviting opinion leaders to be a part of adapting and implementing evidence-based programs" (Reiger et al. 2017, 380)

I suggested that opinion leaders could provide CARC with feedback as to how they felt their department would commit to the adoption of this new digital strategy. In addition these two members would gain technical knowledge on how to use OneNote which would enable them to provide an extra layer of support to their department colleagues and hence benefit their department group during the interventions. According to Orr (2003), "if the opinion leaders observe that the innovation has been effective for the innovators, then they will be encouraged to adopt. This group earns respect for its judicious, well-informed decision-

making" (3). According to Masullo (2016), opinion leaders have the ability to influence the attitudes and beliefs of their colleagues with regards to which technologies were used and how they were implemented to enhance learning. This could be very positive for department adoption of OneNote. Two members volunteered to take up the role of team facilitator and attended the demonstration referred to this as the CARC + demonstration. One of these team facilitators offered to draft a OneNote step by step guide (see Appendix J), following the CARC + demonstration, to support volunteer learning during the interventions. This was already a sign that this team facilitator was undertaking the role of opinion leader by suggesting a strategy that could help to influence volunteer adoption of OneNote in a positive way. As a result, CARC accepted this offer and suggested it to be emailed to me for final review. The decision to invite one member of each department to view this demonstration had been positive as both were optimistic about the adoption of the OneNote approach to CBAs. The adoption of the OneNote approach by the team facilitators was a positive start to our research goal.

4.9 My Research Question – December 2019

Coming to the conclusion of this reconnaissance phase, I was now clear on what my research question would be on entering the action research intervention stage of my study. Prior to planning action interventions, the members of CARC agreed on the research question for this study, "how can I as a senior school leader work with teachers to improve their use of ICT in their teaching?" The following section outlines our planning of the action research interventions which we would direct at addressing my research question.

4.10 Planning Collaborative Action Research Interventions – December 2019

I decided, following collaboration with my CARC colleagues that we plan for three interventions to allow for the transition through the framework. By the end of intervention three it was hoped that teachers would have finalised their OneNote template. Following the CARC+ demonstration, the members of CARC had developed a OneNote training session for their OneNote step by step instruction. The first intervention would focus on OneNote training provided by two members of the CARC committee, under my leadership. The second intervention would see the beginning of department collaboration and increased knowledge construction through social interaction within their department groups on their OneNote

template and the start of the transfer of trainer role to facilitator. The third intervention would complete the transfer of the novice learners to experts, reduced need for support by the facilitator and the completion of their department OneNote CBA template.

4.11 Conclusion

This chapter has outlined the process of reconnaissance, I undertook, initially from hearing casual comments from staff suggesting that the use of ICT in teaching in our school was in decline. The process led me to initiate a collaborative approach to finding a solution to this problem through working collaboratively with staff, then being joined by a volunteer group of teachers, who would help me to establish a way forward in addressing this research issue. The establishment of Office 365 as a school ICT framework provided the basis in which I could proceed with this study. Findings during the Reconnaissance phase had shown that historically ICT teacher professional development in our school had been approached in a "sit and get" tradition where the instructor was in control of what is to be learned and how it is to be learned. Through reconnaissance we now had established that staff wanted a new approach to ICT teacher professional development. The professional development model we had chosen, "the Collaborative Apprenticeship Framework", I believed would increase collaboration, enable teachers to socially construct ICT knowledge and provide them with a more positive experience and improved ICT competencies. In addition teachers now wanted training to address the technical and pedagogical approaches to using ICT in aspects of their teaching. Teachers suggested that this study look at creating a new innovative approach to undertaking CBAs, a relatively new form of teacher practice and one that some teachers felt poorly prepared for. They were aware of the growing demands to integrate innovative practices particularly in undertaking CBAs and this provided me and my CARC colleagues with direction for planning the action interventions for phase 1 of this study.

Chapter 5: - METHODOLOGY

"To study without acting gets a school nowhere; to act without study gets a school somewhere – lost. Studying and acting, when integrated, lead to the same result-an educative, purposeful tool". (Glickman 2003, 55; 2012)

5.1 Brief outline of Chapter 5

The following chapter provides a comprehensive examination of the key aspects relating to the methodology of this research. My research question for this study is "how can I as a senior school leader work with teachers to improve their use of ICT in their teaching?" I begin this chapter by outlining details regarding the participants in my research who initially included our teaching staff, management team and the collaborative action research committee (CARC) and later in Phase 2 the student body. This is followed by an outline of the research approach I adopted, which was predominately, a qualitative methodological approach. Next, I outline my choice and adoption of the research design for this study which was collaborative action research. I then introduce and give a brief outline of the research phases of this study and to help the reader understand the process of each phase of this research, I have provided a time line of and a diagrammatic outline of each phase. Initially, I had planned one research phase of collaborative action research, but the arrival of COVID-19 in Ireland led to an urgent need for me to re-orientate my research and undertake a second phase, where the research question was modified to "how can I as a senior school leader work with teachers to transfer their teaching online?" A review of my role and positionality follows with an examination of the responsibilities I carry, as lead researcher in this study. Following this, I outline the aspects of data collection I adopted, in undertaking this research. The role and importance of my CARC team, as my collaborative teacher research group and as critical friends is outlined. Next, I provide the reader with an outline of the process of data analysis undertaken in this study. This is followed by an explanation of how I addressed the validity and reliability issues regarding this research. Finally, I outline the potential ethical issues that may arise in undertaking this research.

5.2 Research Participants

This research project was situated in a mixed post-primary school in southern Ireland. In the reconnaissance phase of this research, I collaborated with a volunteer staff ICT committee, of six experienced teachers, three male and three females, to select and establish the new school ICT framework, Office 365 and as change agents in this research. Following the implementation of this new framework and the delivery of training to staff in 2018- 2019, I took the decision early in the 2019 -2020 academic year to progress with the next step of my research. To do this I needed to establish a collaborative action research committee (CARC), a group of volunteer teachers, to support and work with me in this next stage of my research. I communicated my need to establish this committee and asked if any of the members of the ICT committee would be interested in joining me on this committee. Five of the six committee members expressed their interest and volunteered to form the committee (CARC) with me as research leader. The members of CARC, continued in their role as change agents and our collaborations together were extremely important to this research process. In addition to this, they also provided critical analysis in the form of critical friends. In meetings, with the CARC, I presented ideas and strategies, which they critically analysed helping me to find clarity in leading the planning of the next step of the research process. According to Riel (2019), collaborative action research can

> *"highlight the different ways in which action research involves collaboration with critical friends. These collaborations can be with people outside of the setting to help understand the action research process and results or with participants in the setting who are engaged in active learning or action research as part of the collaborative action research process"(Riel 2019, 1).*

The CARC, staff and management were instrumental to supporting my research and providing assistance to teachers as I negotiated my way through the research process. The teachers from the Geography and Mathematics department, who participated in Phase 1, of my study provided my research with a rich layer of data. We had offered teachers from these departments the opportunity to volunteer to participate in this research, as these two department teacher groups had never carried out CBAs with students and were due to do so in a few short weeks. In addition we invited one representative from each department to attend the CARC+ demonstration which provided an overview of the use of OneNote in undertaking CBAs. These two representatives became team facilitators with the possibility, we hoped, of providing the role of opinion leader within their department group. As a result

second year Mathematics and Geography teachers volunteered for this phase of the research. The OneNote CBA interventions would prepare and support them, as a department, in carrying out their CBAs with students in the coming weeks. They showed a real sense of commitment to the action research process and demonstrated how collaboration can lead to an embedded sense of community and greater focus on the student learning experience. In Phase 2 of this research, all staff, approx. 60, given the serious pandemic threat to teacher and student health, in engaging and participating in the preparation for the imminent school shutdown due to COVID-19. We carried out our first intervention, in phase 2, in school on the 12th March 2020, with the teaching staff to prepare them to transfer their teaching online literally overnight. Post school closure, our CARC committee set about undertaking further interventions in the form of staff and student surveys. In both surveys teachers and students were sent an email, where we had embedded the online survey link, inviting them to participate in the survey We did this to gather unique data sets at this time of crisis that would inform us regarding further cycles of action research that we believed would be needed in addressing issues that arose from the rapid transfer to online education. Participation in both surveys was voluntary and anonymous and resulted in a completion rate of 78% in the staff survey and 18% in the student survey.

Research Paradigm and Theoretical Stance

According to Kivunja et al. (2017), a paradigm defines a "researcher's philosophical orientation" and has significant implications for every decision made in the research process, including choice of methodology and methods (p.26). Lather refers to a research paradigm as inherently reflecting the researcher's beliefs about the world that s/he lives in and wants to live in. It is the lens through which a researcher looks at the world.

Phillips (2000), proposes that educational constructivism, itself, includes a number of variations and the two most popular types of these variations are: Jean Piaget's cognitive and personal constructivism and Lev Vygotsky's social constructivism. My research can be considered from an epistemological perspective that draws most closely from Vygotsky's social constructivist paradigm, having an emphasis on the exploration of the area of adoption, in particular drawing on Rogers' (1983) theory of innovation and the collaborative nature of learning within the cultural and social context of a school setting. Participants were encouraged to reflect on their own experiences and discuss their own views, consistent with a social constructivist stance. Emphasis was on collaborative learning, where learners share and

construct knowledge together. “Social constructivism represents the most general extant perspective of constructivism with its emphasis on social exchanges for learners’ cognitive growth and role of culture and history in their learning” (Amineh and Asl 2015, 12). Vygotsky (1978), claims that cognitive growth occurs first on a social level, and then it can occur within the individual. Kim (2001), explains that social constructivism is based on specific assumptions about reality, where reality is constructed by human activity and does not exist in advance. Knowledge, through social constructivism is a human product that is socially and culturally constructed and learning is a social process. According to Schunk (2012), social constructivist teaching approaches emphasize reciprocal teaching, peer collaboration, cognitive apprenticeships, problem-based instruction, web quests, anchored instruction, and other methods that involve learning with others. According to Wertsch (1997), social constructivism not only acknowledges the uniqueness and complexity of the learner, but actually encourages, utilizes and rewards the learner as an integral part of the learning process. Bauersfeld (2012), in referring to the social constructivist approach, explains that instructors in this approach are introduced as facilitators and not as teachers. The difference in role is distinct whereas a teacher gives a didactic lecture that covers the subject matter, a facilitator helps the learner to get to his or her own understanding of the content. The role of the learner is also contrasted as the learner plays a passive role when the instructor just teaches, however the learner plays an active role when the instructor facilitates the learning process and helps learners to learn (Amineh and Asl 2015). In relation to my research, through a collaborative ICT professional development approach, (what I refer to as a “collaborative apprenticeship framework”) the constructivist trainer facilitator incorporates a collaborative learning task that enables less ICT competent learners, through social interaction, to develop with help from more ICT skilful colleagues within their zone of proximal development (ZPD).

Learning according to Vygotsky (1978), is a continual movement from the current intellectual level to a higher level which more closely approximates the learner's potential. This movement occurs in the zone of proximal development (ZPD), as a result of social interaction. ZPD is defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky and Cole 1978, 86). The ZPD provides a type of scaffolding to the learner, “those elements of the task that are initially beyond the learner’s capacity, thus

permitting" the learner "to concentrate upon and complete only those elements that are within their range of competence" (Wood, Bruner, and Ross 1976, 90).
My research not only focuses on knowledge construction through social constructivism, but also, on the diffusion of new ICT innovations that arose from this study. Rogers' (1983), theory of innovation provides a lens to examine aspects relating to the process of evaluating, selecting, adopting and diffusing these new innovations.

According to Rogers (1983), an innovation is "an idea, practice or object that is perceived as new by an individual or another unit of adoption" (p.11). Rogers also claimed that the newness of the innovation does not just involve new knowledge, but also new ways to approach the perceived problem or need. The two innovations that arose from this study were firstly, the new school ICT framework Office 365, and secondly, the innovative ICT approach we developed to undertake CBAs in our school. This study specifically focused on teacher participants' experiences related to the adoption and diffusion process of these new innovations. It is they who made the decision to adopt or reject these innovations. Diffusion of innovations is "the process by which an innovation is communicated through certain channels, over time among the members of a social system" (Rogers and Williams 1983, 5). The process of this theory begins with the participants or adopters in the social system, who are considered the major players in innovation diffusion, working through a decision-making process while communicating with other members of the social system to determine if the innovation will be a success or a failure within their organization (Hoerup 2001). The change agents are usually brought in by the change agency. Bevin (2018), defines a change agency as "the power, individually and collectively, to make a positive difference. It is about pushing the boundaries of what is possible, mobilising others and making change happen more quickly" (Beven 2018). As a senior school leader and lead researcher, who initiated this research, as a result of a problem raised from a bottom up data gathering I undertook, I consider that I represented the change agency in this research. However, following the instigation of this research, I also became a change agent, and was joined by a volunteer group of teachers who formed a committee that supported and worked with me and the teaching staff to diffuse and support adoption of new approaches to ICT in our school.

"Change agents are individuals who can successfully transform aspects of how organisations operate. In education, teachers as change agents are increasingly seen as vital to the successful operation of schools and self-improving school systems" (Brown, White, and

Kelly 2021, 1). The change agent's role is to mentor the participants, guide them to the direction of adoption, and provide reassurance once the decision to adopt has been made. Often the instigators of the innovation, the change agents, will transfer information to opinion leaders within the organization. In my research, the role of opinion leaders was particularly important in the first phase of the research which is outlined in chapter 5 – Collaborative Action Research Interventions: Phase 1.

"Opinion leaders have the most influence on individuals who are similar to them, making social groups an important consideration in opinion leader recruitment" (Reiger et al. 2017, 1). This was important as the team facilitators we believed would be opinion leaders, one from each subject department, which would help to support and spread their influence to the remaining individuals within their department group enabling adoption of the CBA OneNote template. According to Rogers (1983), the rate of adoption of an innovation depends on the number of times opinion leaders take to activate diffusion, in the case of this research within their department grouping.

5.3 Research Approach

By the end of reconnaissance, I had clarified my research question which was "how can I as a senior school leader work to improve the use of ICT by teachers in their teaching?" I worked in collaboration with the CARC, who helped through our collaboration with staff in identifying what aspects of teachers practice would provide the best opportunity for developing action steps or interventions that could enable teachers to improve their use of ICT and benefit student learning.

Using a predominantly qualitative approach throughout this research enabled me to gather data which led me to identify the most effective and innovative approach to addressing the research question. Involving all staff members from the start of this process were essential to gaining their co-operation, support and participation throughout this research. Over the course of the reconnaissance phase, I made decisions that were informed by what staff believed and valued. Staff were influential in the decision to select an innovative approach to ICT professional development and in the identification of classroom based assessments (CBAs) as a relatively new practice for teachers and students. This approach is advocated by Ryan and Bagley (2015) who state that "in order to improve technology integration, the first

step is to understand the reasons, beliefs, and values of teachers implementing technology in the classroom" (p.40).

5.4 Research Design

Action research is one of many kinds of practitioner research. Central to action research is bringing about change of some kind and usually within the researcher's own context. In respect of this research I as a senior school leader chose action research in an effort to work with teachers to help them to adopt ICT into their practice. "Teachers recognize action research as a means of professional development and a useful approach for generating actionable knowledge pertinent to their own field of activity and changing the educational setting for the better" (Moghaddam 2007, 228). Following an exploration of appropriate methodologies, I identified Kurt Lewin's proposed methodology of 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"
> (Tindowen, Guzman, and Macanang 2019, 1788).

Lewin's research aimed to promote social action through democratic decision making and active participation of practitioners. I too, wanted to promote social action through my work with teachers, to improve their ICT use in teaching, but to do so through collaboration and democratic decision making in which research volunteers and participants engage and socially construct knowledge in the research process. My research would include Lewin's two key components of group decision making and participants commitment to improvement (Bryant 1995). In order for this research to achieve success, I needed to have staff support and commitment to adopting ICT into their teaching. The collaborative nature of my research would ensure that group decisions would form a key aspect of the process. Lewin believed that the idea that when making changes in teaching, it is unlikely that a 100% success rate is achieved and so one cycle of planning, acting, observing and reflecting usually leads to another cycle in which improvements are incorporated based on the previous cycle. I planned three cycles or interventions in Phase 1 of this research. I believed that it would provide me as researcher with the opportunity to seek feedback, reflect and make changes accordingly in planning the next cycle. As presented in (Fig. 5)

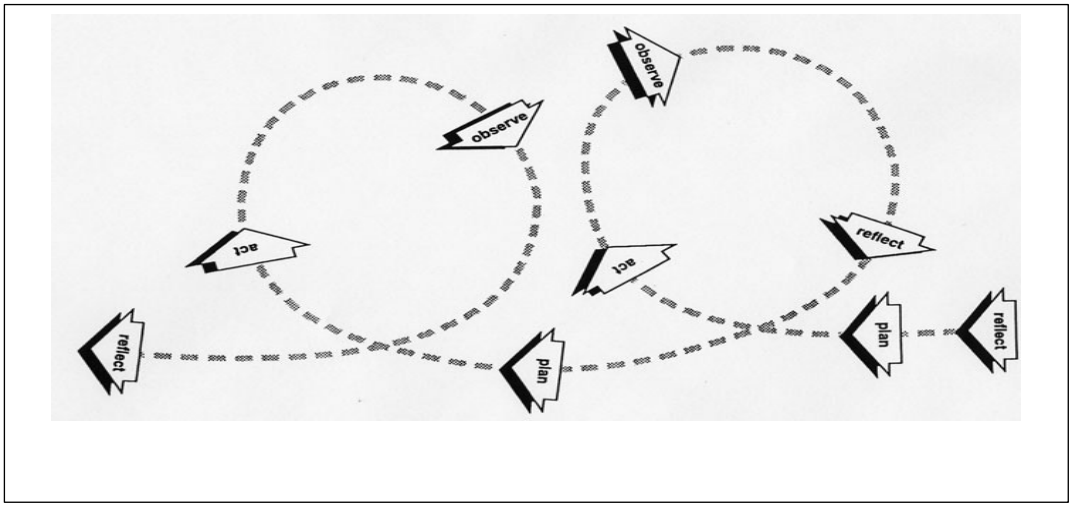


Figure 5. Kurt Lewin's Action Research Cycles- planning, acting, observing and reflecting

5.5 Why I chose Collaborative Action Research?

According to Tekin and Kotaman (2013), "there are traces of positivism and post-positivism in action research. However, it can be classified as a post-positivist mode of inquiry due to its conditional nature" (p.86). Action research can be conducted to find solutions to social problems and especially educational problems. Tekin and Kotaman outline key characteristics of action research. With action research;

> *"it is not possible to reach objective and extrinsic facts. The subject of research should not be scientists' individual curiosities but problems that practitioners encounter when applying curricula. In action research, practitioners are the best researchers because their knowledge is a significant knowledge base. In action research, participants in social programs are also equal partners in research and have the right to join in the preparation and/or improvement process of programs. Theoretically, there is no end for action research because social issues are dynamic and in that dynamic structure problems arise all the time" (Tekin and Kotaman 2013, 86).*

Through carrying out this research, I am aware that I am aiming to work with teachers to improve their use of ICT in teaching. I realise that there is no final objective in this as improvement will be ongoing. The problem, I identified is one I encountered through a student evaluation survey of school experience. As a senior leader and former teacher I have a significant knowledge base of my school and staff. The collaborative nature of my research process provides for all staff to join in this improvement process. It provides the opportunity for staff to engage in socially constructing knowledge as opposed to the emphasis previously placed on constructing knowledge in isolation of their colleagues, which had limited success. According to Ostovar-Nameghi et al. (2016), nowadays teachers are the subject and object of learning. Co-operation is essential for them to develop themselves professionally. "While traditionally they waited for the educator to bombard them with externally imposed methods

and techniques through crash teacher training courses, teachers now collaborate and learn from each other's experience" (Ostovar-Nameghi and Sheikhahmadi 2016, 199).

In researching the appropriate type of action research for this study, I identified collaborative action research. Collaborative action research does not require all those affected by and involved in the research context to have a role in democratic decision making about all aspects of the research.

> *"In the collaborative action research approach, collaboration plays a core role, and this may take place between teachers, students, teaching assistants, parents, and anyone involved with the school community. In educational contexts, there is usually one, sometimes more than one, lead researcher who consults with others, and draws others into the research project as 'co-researchers' or observers or contributors in some aspects of the project but although their perspectives may influence the research, they do not share responsibility for overall decision making regarding different aspects of the project" (Armstrong 2019, 7).*

Collaborative action research is a dynamic process, which planning, action, observing, and reflection are not static steps isolated from each other, but instead are interwoven "moments" in the collaborative action research spiral. Each time "through" the cycle will redirect and refocus the group (Bryant 1995). The adoption of collaborative action research facilitated me and my CARC colleagues to introduce to my research an innovative approach to professional development, the collaborative apprenticeship model (CAM). This provided a framework for my research which offered the opportunity to create ICT professional development focused on a small group and which aided the strengthening of teacher learning, collaboration and interdependence.

5.6 Brief Outline on Research Phases

In the following section I intend to explain my research phases firstly providing a timeline of the steps taken prior to and incompletion of Phase 1 (Fig. 6) supported by diagrammatic view of this process (Fig. 7) I then provide a timeline (Fig. 8) of the unexpected Phase 2 of this research and this too is supported by a diagrammatic view of the research process undertaken (Fig. 9).

Reconnaissance and Phase 1 Timeline	
DATE	**MILESTONE**
Apr-18	Student Experience Evaluation Survey (SEES)
May-18	Feedback to Teachers on analysis of SEES
May-18	Formation of ICT Committee (ICTC)
May-18	ICTC explore possible ICT School Framework
Jun-18	Decision to adopt Microsoft Office 365
Jun-18	Installation of Microsoft Office 365
Sep-18	ICTC Office 365 Training
Sep-18	Office 365 Roll out Part 1
Jan-19	Office 365 Roll out Part 1
Sep-19	ICTC (4 of 5) become CARC (Collaborative Action Research Committee)
Sep-19	Teacher Survey re: their use of ICT in their teaching (TICTS)
Nov-19	Validation Teacher Focus Group Meeting
Dec-19	CARC now have clarity on Action Research Question and informed on intervention planning
Jan-20	OneNote CBA template training 1
Jan-20	OneNote CBA template training 2
Feb-20	OneNote CBA template training 3
Feb-20	Evaluation and reflection

Reconnaissance Phase

Phase 1
Collaborative Action
Research CBA
OneNote Interventions

Figure 6. Reconnaissance & Phase 1 Timeline

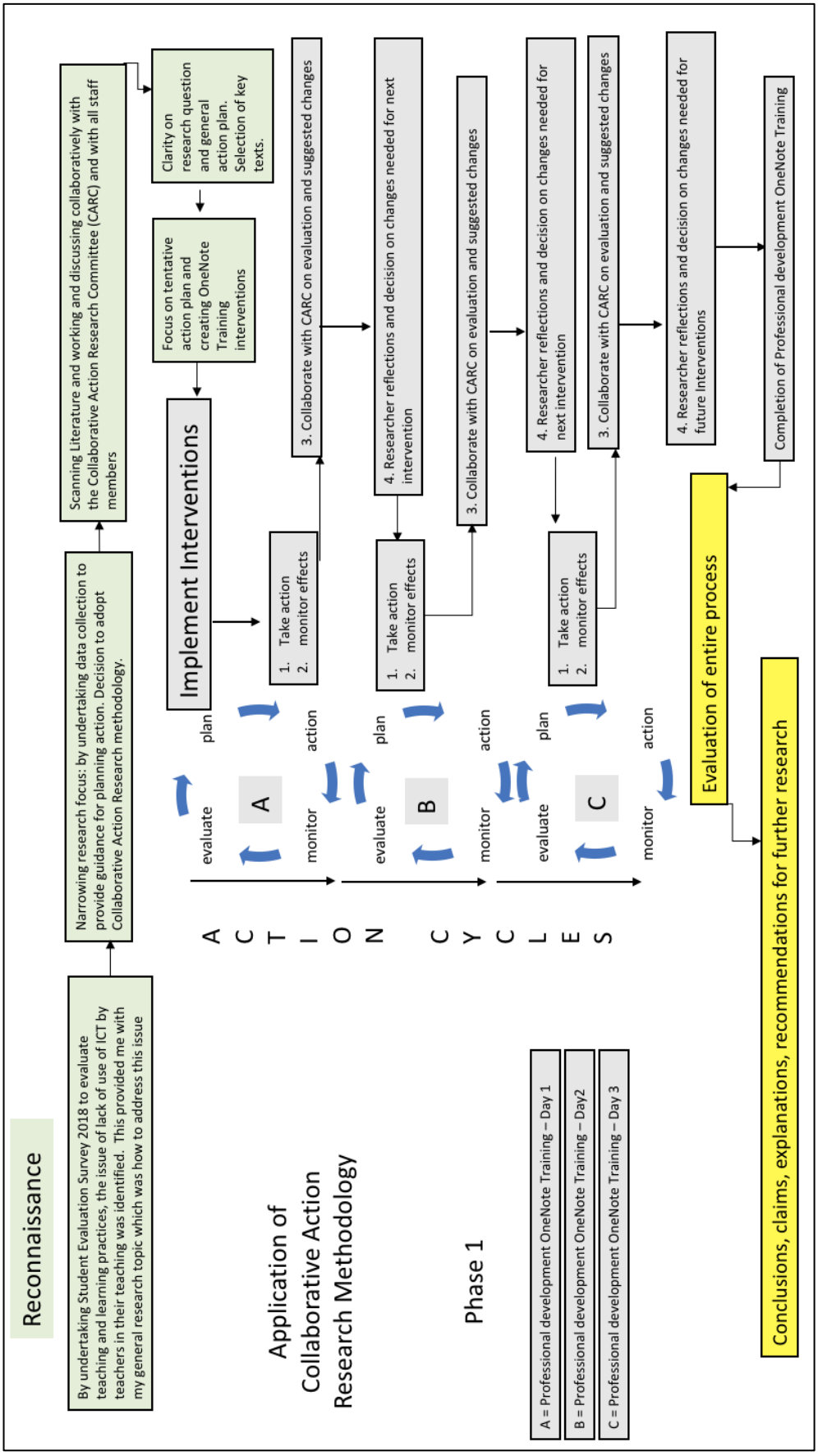


Fig 7 Phase 1 Collaborative Action Research of this study- Adapted from (Koshy, Koshy, and Waterman 2010)

Figure 7. Research Phase1 - Diagrammatic outline

Fig. 6 illustrates the timeline relating to the process I undertook from the reconnaissance phase of this research to the completion of the three OneNote CBA interventions undertaken with volunteers from the Mathematics and Geography departments.

Fig. 7 provides a diagrammatic outline of how the reconnaissance undertaken led to the commencement of Phase 1of this research. The reconnaissance phase is outlined from identifying the research issue to clarifying the research question (in green). Following on from this I generated an action plan to carry out research interventions. I began implementing the planned interventions A, B, C (grey). At the end of each intervention, feedback and reflection were undertaken resulting in changes to the planning of the following intervention. On completion of all three action research intervention cycles, having gathered ongoing feedback and reflection during the last intervention, I under took my own evaluation of the entire process (yellow) and a further evaluation of the process with the members of the CARC. These two actions in evaluation led me to reach a series of conclusions and recommendations for future interventions.

Fig. 8 illustrates the timeline of the second unexpected phase of my research, initiated by the arrival of COVID-19 on our shores. In response to the imminent closure of schools, in Ireland, in March 2020, the CARC prepared for the implementation of an in-school intervention to prepare all staff for the transfer of teaching online. Following school closure, the need arose to undertake two further action research cycles. These took the form of a Staff and Student survey.

COVID-19 Intervention Timeline

DATE	MILESTONE
Mar-20	**Arrival of COVID-19** - schools wait imminent closure - **Refocus of my research question** leading to urgent planning to transfer teaching and learning online
Mar-20	12th March - Government announce immediate school closure from 6pm. Urgent implementation of **Teacher Teams Intervention** prior to closure
Mar-20	**CARC provide ICT online support** and phone support to teachers during school shutdown
Mar-20	Decision taken by CARC, following feedback from the provision of ICT teacher support, to **undertake a Post Closure Teacher Evaluation Survey of COVID-19 Online Teaching and Learning 2020** to gather data on their experience of online teaching.
Apr-20	On **analysis of Teacher Survey** re Online teaching, the issue of lack of student engagement is raised.
May-20	CARC decide to **undertake a Post Closure Student Evaluation Survey of COVID-19 Online Teaching and Learning 2020** to identify why students encountered issues with online teaching and learning
May-20	On **analysis of Student Survey** re Online teaching and learning identify issue raised regarding student non engagment in remote teaching and learning
May-20	Results of both survey give rise to the need for **further action research** to address issues raised and in preparation for further school shutdowns due to COVID-19 Pandemic

COVID-19 – Collaborative Action Research Phase 2

Figure 8. COVID-19 Intervention Timeline

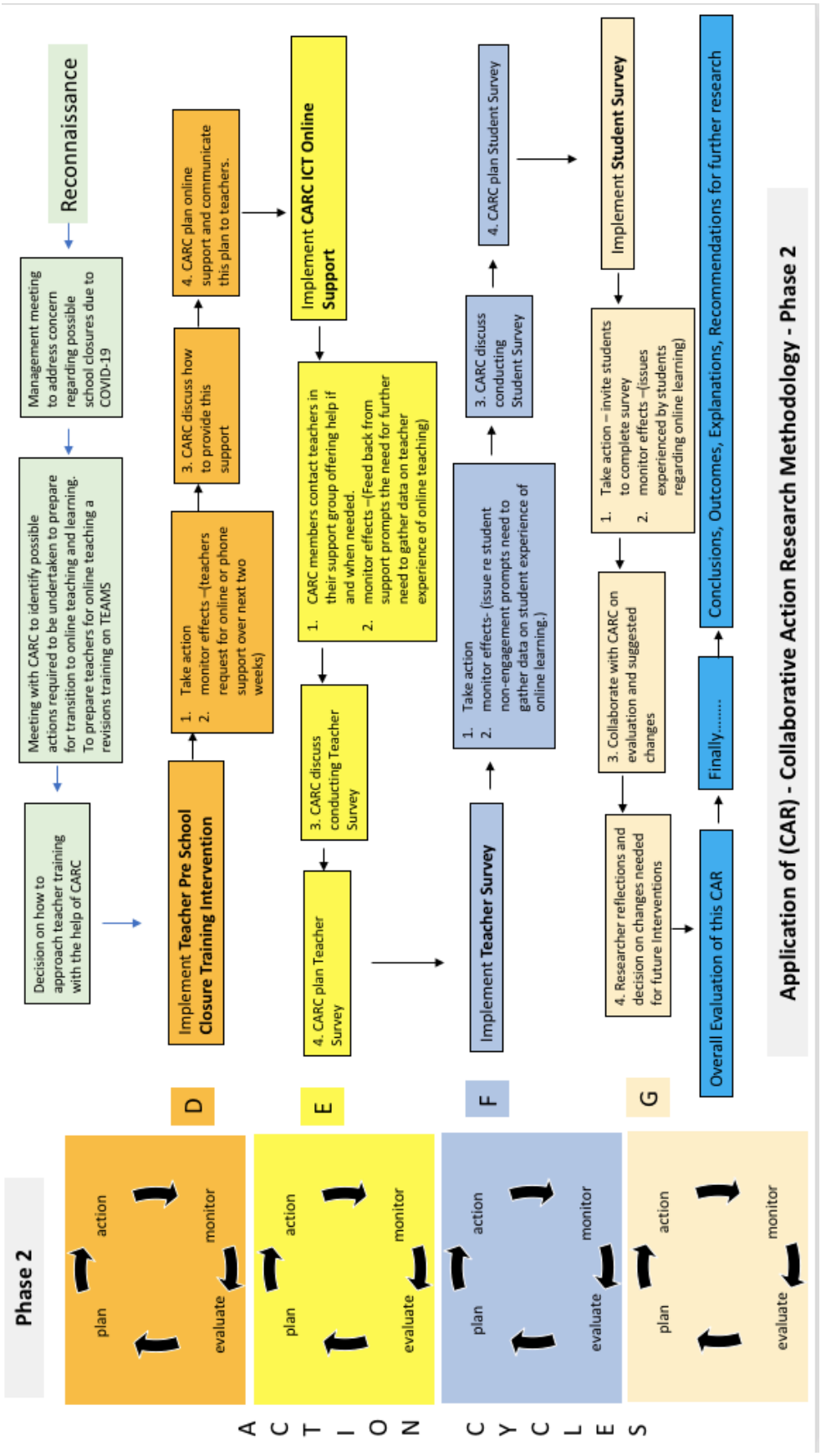


Fig 9. Phase 2. Collaborative Action Research of this study. Adapted from (Koshy, Koshy, and Waterman 2010)

Figure 9. Research Phase 2 - Diagrammatic outline

Fig. 9. provides a diagrammatic outline of phase 2 of this research. The arrival of COVID-19 and its subsequent impact on the Irish society, resulted in the Irish government endeavouring to take action to try to halt the spread of the virus. As a result schools were given little notice when they were told to close on March 12th, 2020. The suddenness of this announcement meant that time was limited for us to react and plan an action that would help and support teachers in the overnight transfer of teaching to online teaching. For this reason our first intervention from this phase was short and focused. A short period of reconnaissance (green) was undertaken to identify the needs of staff relating to their transfer of teaching online. This would enable us to determine what interventions would be necessary prior to school closure. Given the short period of time before school closure we were able to plan one intervention to address the emergency needs of staff for the transfer of teaching online. The second intervention, in this phase arose as a result of a request from staff for additional support during their initial phase of online teaching. Staff enquired if support through email or phone contact would be available following school closure. CARC members were keen to support staff and agreed to provide this support. We held a short meeting of CARC following the first intervention. We took the decision to split the staff group up so that each of us would provide support for the same small group of teachers over the two-week school closure. Each of us agreed to contact the teachers in our individual group to inform them that we would be available to help with any ICT issues they encountered. The third intervention came two weeks later. Following the support provided by CARC members of staff, we became increasingly aware from feedback during these interactions that teachers had met challenges and opportunities as a result of their transfer to online teaching. I suggested to my CARC colleagues that we conduct a staff survey to gather detailed data on their experiences of this time in an effort to identify what issues we, the CARC members could address in collaboration with staff. I drafted the survey and took input from my CARC colleagues before inviting staff to complete it. On receipt of the survey data, I carried out analysis before providing feedback to the CARC. On reflecting on the results of this survey we identified a key issue staff had encountered that of student poor or non-engagement. This led me to suggest that it would be important to learn from our students more about their experience of online teaching and learning and why this issue of engagement had occurred. Three weeks later (green) we created and distributed a link to students inviting them to volunteer to complete the Survey (Intervention 4). A number of students completed the survey (blue). I undertook data analysis and provided feedback to the other members of CARC. I reflected on

the analysis of both surveys and identified conclusions and recommendations for further research (blue).

5.7 Researcher's Role and Positionality

Research plays a vital role in addressing problems and issues for continual improvement (Creswell, 2014). In undertaking this research, I was an insider researcher, who sought to work with teachers to improve their use of ICT in their teaching. I have been a lifelong promoter of integrating ICT into our educational practices. "It is argued that insider researchers always have a passion about the topic they been working on. This means that they would commit themselves into the research despite all the obstacles" (Saidin 2017, 850). This is true in my case, and in addition, I have experience of undertaking action research previously in examining my own teaching and therefore am aware and understand the commitment required to thoroughly engage with the action research process. Bonner and Tohurst (2002), believe that being an insider researcher gives three advantages to the research. First, an insider will be able to better understand an issue; second, s/he will not disrupt the flow of social interaction; and finally, s/he will be able to extract true data from the participants as s/he can relate well to (Bonner and Tolhurst 2002). I certainly believe that I as the researcher experienced these advantages. As mentioned previously, I have a long history in developing and supporting the use of ICT in teaching and learning in our school. As a long-term staff member, I believe I have a positive relationship with my colleagues, and from this believe they provide data in an open and honest manner. In addition to these advantages I also had the advantage of what Saidin (2017) claims, that

> *"In addition, a researcher's familiarity with the cultural and political structure of an organisation will help him to save time in trying to understand the issue he is studying as he already has some knowledge regarding the issue" (Saidin 2017, 850).*

Finally, as a school leader I was very aware of the need as an insider researcher to follow the guidelines of BERA 2011, which I will refer to later in this chapter.

5.8 Data Collection

I selected a primarily and substantially a qualitative approach to data collection to conduct this research. On occasions in surveying volunteers, I did draw on a small and intermittent

collection of quantitative data using Likert scales. The qualitative data collection methods that I employed to examine participants experiences were surveys, validation focus group meetings, observation, group interviews and email. Qualitative data collection methods allowed me to identify issues from the perspective of my study participants (volunteers) and understand the meanings and interpretations that they gave to behaviour, events or objects (Hennink, Hutter, and Bailey 2020).

5.9 Surveys

Over the course of reconnaissance and phases 1 and 2 of this research, I created surveys that primarily gathered qualitative data through the use of open ended questions, which would aim to reveal opinions, experiences, narratives or accounts of participants experiences relating to ICT. On occasions I did include the use of Likert scales to ascertain information regarding participants attitudes, perceptions or values.

The following is a timeline and list of the surveys undertaken to gather data for the purpose of this research study (Fig. 10). In addition I have provided a detailed explanation of when and why each of these surveys was undertaken.

Sep-19	Teacher Survey re: their use of ICT in their teaching (TICTS)
Mar-20	Decision to undertake Post Closure Teacher Evaluation of COVID-19 Online Teaching and Learning 2020
May-20	Decision to undertake Post Closure Student Evaluation of COVID-19 Online Teaching and Learning 2020

Figure 10 . Timeline and Name of Surveys undertaken

Reconnaissance Phase Survey

1. Teacher Survey on the use of Digital Technologies in Teaching and Learning 2019 (Appendix B). Following the introduction and implementation of Office 365, in the academic year 2018-2019, I made the decision to progress to the next phase of my research. This required me, in collaboration with my CARC colleagues, to carry out a Teacher Survey, in September 2019, to learn how we could plan and implement action research interventions to address the research question of "how can I as a senior school leader work with teachers to improve their use of ICT in their teaching?" I adopted aspects of the survey that had been designed and implemented in the Erasmus+ Research Programme; "21st Century European Classroom: meeting the challenge of the digital era with innovation and creativity" (Up2Europe.eu) (Appendix D).

Phase 2 – Post School Closure Surveys

1. Post Closure Teacher Evaluation of COVID-19 Online Teaching and Learning 2020 (Appendix E). Following school shutdown by the Irish government in an effort to reduce the spread of the COVID-19 virus, the CARC made a decision to survey teachers, in March 2020, to identify how best we could support teachers in their provision of online teaching. Data gathered from the Post Closure Teacher Evaluation of COVID-19 Teaching and Learning 2020 survey identified a number of issues with student engagement regarding online teaching and learning. We therefore decided to carry out a Post Closure Student Evaluation Survey to identify why there were some issues with student engagement online.
2. Post Closure Student Evaluation of COVID-19 Online Teaching and Learning 2020 (Appendix G). We carried out this survey in May 2020. Students provided a rich set of data which identified a number of reasons why there were issues with student engagement. Results from this survey, and that of the teacher survey, will be critical to inform the CARC of measures we need to take prior to any further school lock downs are necessities for online teaching.

Over the course of this research, I used online survey platforms rather than the traditional paper based surveys. Online survey platforms have a number of advantages as they are faster to complete, easy to use for both participants and research, accurate and provide excellent tools for analysis. "This is evident in terms of the design, such as self-administration, question skips and filters, randomization of answers, and inclusion of multimedia resources, as well as the fact that answers are immediately stored in a database" (Gerber et al. 2017, 100). This flexibility can help to save time and costs while reducing the possibility of transcription errors of lost data. According to Braun et al. (2021)

> *"a key advantage of online qualitative surveys is openness and flexibility to address a wide range of research questions of interest to social researchers, as the method allows access to data that range in focus from peoples' views, experiences, or material practices, through to representational or meaning-making practices"(p.642).*

There are some disadvantages as Andrade (2020) outlines, regarding the results of online surveys. "The results of online surveys must be regarded as tentative when the surveys are distributed to an unknown audience and when voluntary participation in the survey can result in respondents with biases selecting themselves into the sample" (Andrade 2020, 576). In my research the surveys were distributed to a known audience however the possibility of respondent biases cannot be ruled out. Again for this reason I made every effort to produce a balanced analysis of data collected. In relation to creating my surveys, I was aware of the importance of asking the right questions to ensure I gathered the desired information.

> *"The way you phrase a question can have a significant impact on the quality of answers and data. You can call it fascinating or simply brain racking. In the end, you can divide survey questions into two categories: closed-ended questions (for quantitative data) or open-ended questions (for qualitative data)" (Netigate 2021, 1).*

5.10 Participant Validation Focus Group Meeting– November 2019

The trustworthiness of results is key to high quality qualitative research. According to Bygstad and Munkvold (2007), in qualitative research studies, some form of member validation or participant validation is considered common practice. The nature and objective of participant validation vary significantly for research conducted under different paradigms. My approach to this research was to ensure that teachers (members) played an active role in collaborating with I and the other members of CARC in validating the survey data and

beyond merely being “informants”. “Member checking, also known as participant or respondent validation, is a technique for exploring the credibility of results” (Birt et al. 2016, 1) For the purpose of this study member checking validation is referred to as participant validation.

Following the undertaking of the Staff Digital Technologies in Teaching and Learning Survey 2019, I was eager to validate survey results by using a participant validation focus group from the staff. We were keen to clarify aspects of the survey which could provide more assurance and direction to developing planned interventions. Certain sets of data gathered from the survey were lacking detail and required further discussions providing more depth and detail to help us in our further analysis. We looked to staff for volunteers and eight staff members came forward to form a participant validation focus group who could share more light on the data gathered. In addition, Bygstad and Munkvold (2007), outline the practicalities of adopting this approach “from a practical viewpoint, member validation is justified by the common-sense wisdom of asking the source of information to verify that it is exact and complete” (Bygstad and Munkvold 2007, 1)

In this research two members of the CARC and I held a participant validation focus group meeting. The validation group, consisting of 12 teacher volunteers, were provided with a copy of the survey data and asked to examine it and provide feedback on their considerations regarding the validity of data gathered. According to Whitehead (2016), member check focus groups can have the potential to alter the researcher’s interpretation of the original data set but, on the other hand, these groups can strengthen the trustworthiness of findings. For the members of CARC there was a need to check our interpretation of the original data set and this we believed would strengthen the trustworthiness of the findings.

5.11 Observation during CBA OneNote Interventions

Given my lens relating to social constructivism, observation was a necessary method of data collection. It was through observing that I could see and note the department groups collaborating and building their knowledge of OneNote together. I was able to observe how the volunteers moved from a dependent situation, where their sole focus was on the trainer to a situation where they no longer needed the trainer and were clearly displaying characteristics

of interdependency and community. I and two members of CARC carried out the three OneNote CBA interventions. As the main researcher, I provided a support role to the volunteer participants, while my two CARC colleagues delivered the OneNote training and facilitations.

There were challenges for me to balance my role in supporting the volunteers in their learning, as a member of CARC, while remaining focused on the important role of observing and notetaking. As Baker (2006) states

> *"observation is a complex research method because it often requires the researcher to play a number of roles and to use a number of techniques, including her/his five senses, to collect data. Despite the level of involvement with the study group, the researcher must always remember her/his primary role as a researcher and remain detached enough to collect and analyze data relevant to the problem under investigation"*(Baker 2006, 172).

Observation provides the researcher with a combination of methods. These can include unstructured conversations/interviews, note taking and recordings (audio and video). In my study I employed all of these methods throughout the interventions stages, which enabled me to observe the process volunteers were engaging in their building of knowledge together and the progress, to a greater or lesser extent, department groups were making in advancing their OneNote and their CBA template. I would occasionally hold short conversations to check in with individual or group experience of the intervention. I took notes on these conversations and all other observations during each intervention. I used audio, with the permission of the volunteers, to make voice notes or gather comments volunteers were keen to make. Observation enabled me to immerse myself in my study so that I could not only see but feel the changes that occurred as groups deepened their collaboration in an effort to produce the best CBA OneNote template they could for their students and themselves. This attention to detail during observation provided me to clearly see the effects of each intervention and if it was resulting in the change we the CARC members had hoped for in implementing these action interventions. According to Bryant (1995), "detailed observation, monitoring, and recording enables the assessment of the effects of the action or Intervention, and hence the effectiveness of the proposed change" (Bryant 1995, 24).

5.12 Group Interviews during CBA OneNote Interventions

I employed group interview methodology at stages throughout this research.

> *"The group interview is essentially a qualitative data gathering technique (see Madriz, Chapter 32, this volume) that relies upon the systematic questioning of several individuals simultaneously in a formal or informal setting. Thus this technique straddles the line between formal and informal interviewing" (Fontana and Frey 1994, 651)*

In phase 1 of my research, in undertaking the set of three planned interventions, I engaged in carrying out group interviews with the seven volunteers, from the two department teacher groups participating in this phase of the research, at the end of each intervention to gather their feedback and reflections.

> *According to Gill et al. 2008 "The purpose of the research group interview is to explore the views, experiences, beliefs and/or motivations of individuals on specific matters. Qualitative methods, such as interviews, are believed to provide a 'deeper' understanding of social phenomena than would be obtained from purely quantitative methods"(p.292).*

I chose to adopt the unstructured approach. One reason for this was that unstructured interviews do not reflect any preconceived theories or ideas. The aim is to have an informal and relaxed atmosphere so that participants can tell their own story. In my research each group interview, I generally looked to the seven teacher participants to tell me about their experience of the intervention.

> *"Unstructured interviews do not use any set questions, instead, the interviewer asks open-ended questions based on a specific research topic, and will try to let the interview flow like a natural conversation. The interviewer modifies his or her questions to suit the candidate's specific experiences. Unstructured interviews are sometimes referred to as 'discovery interviews' and are more like a 'guided conversation' than a strict structured interview. They are sometimes called informal interviews". (McLeod 2014, 2)*

I was aware that on the cautionary side, that group dynamics can have an impact on the interview. "Lessons from group dynamics tell us that the characteristics of the group (e.g. size) and background of members (e.g. leadership style) can impact the interaction and response patterns within the group. Still, the group interview has great potential for social research" (Frey and Fontana 1991, 175). In order to ensure we did not encounter such impacts we took a series of steps which are outlined later in this chapter.

Email

On occasions, following the end of an intervention in Phase 1, I asked trainers from the CARC if they would email me their reflections on their experience and observations of the training and to make suggestions that they thought I should consider in planning the following Intervention (Appendix H & I). According to Gaiser and Schreiner (2009), as far as research goes, there is little reason to be concerned about which email application you use. Providing feedback via emails can have the advantages of being timely, motivational, individual and manageable (Zhu 2012). Emails can allow teacher respondents to send individualised feedback to the researcher quickly to inform planning for the following intervention. Since (2018), there are obligations on all organisations including schools to adhere to ensure that all data collection, storage and use of personal information is protected and stored securely. In 2018, the General Data Protection Regulation (or GDPR) was introduced into legislation. All organisations must be compliant with the new GDPR rules (Webwise). This had implications for schools and in particular, for me as a researcher, to ensure that the use of email in terms of data collection of personal information is processed fairly and lawfully. As a researcher adherence to the rules of GDPR are essential and thus "data protection is essential: it means privacy and respect, and freedom from manipulation".(Webwise) By using the email tool "Outlook" from Office 365, I am confident in the fact that "Microsoft has decades of experience ensuring that their Office suite and Microsoft 365 is optimized for security and data privacy, and comes with a vast library of IT security and data protection features that have been specifically designed for its users to ensure they can protect their data and stay compliant with relevant data privacy regulations" (Calligo 2020). In line with Maynooth ethical guidelines I use my Maynooth University email and Office 365 account.

5.13 Additional forms of Data collection

As we progressed through Phase 1 of this research, there were a few additional opportunities to gather data. These were associated with the outcomes from the three interventions which included the OneNote support sheet produced by one of our team facilitators to help colleagues in their OneNote training (Appendix J). The second was the OneNote CBA templates that each department created as a result of the three interventions.

5.14 Data Analysis

"Data analysis is the process of systematically searching and arranging the interview transcripts, field notes, and other materials accumulated to increase understanding of them to enable the presentation of what was discovered" (Hoerup 2001, 35). In both phases of this research I undertook a thematic approach to data analysis, which according to Nowell et al. (2017), is "a method for identifying, analysing, organizing, describing, and reporting themes found within a data set" (p.2) or as Braun and Clarke (2006) outline a method for analysing qualitative data that entails searching across a data set to identify, analyse, and report repeated patterns. In the first phase of this research, as lead researcher, I undertook a systematic search from the qualitative data, gathered in the form of field notes and transcripts, compiled from recordings taken of each group interview, and carried out towards the end of each of the three interventions. These recordings were undertaken, with the permission of the volunteer group which consisted of seven teachers. In these group interview/discussions volunteers offered their reflections and opinions on their experiences of each intervention. The recordings generally lasted ten minutes. I transcribed the recordings into a journal. This began a process of data familiarisation as I scanned the transcription for any sign of emerging themes or patterns. At this early stage a few key themes began to become evident. For example, the theme of "collaboration" was repeatedly mentioned in the data sets leading to a clear indication that it would become a code in the process of analysis. "In conducting a thematic analysis, it is common to sort and sift through the data set to identify similar phrases and/or relationships, a practice that has been described as being common across many qualitative analytic approaches" (Miles and Huberman 1984, 11, 1994). The next step in the analysis was to create an excel file, where I could input the contents of the transcription. This enabled me to familiarise myself with the data further. The positive reaction to the use of OneNote as a tool to undertake CBAs became more evident as an emerging theme at this stage. Following the examination of the excel file, I imported this file into MAXQDA, a data analysis software programme. "MAXQDA makes it possible to analyse the co-occurrence of codes and visualize the relations among them. Such analyses allow for the study of hidden information and provides the researcher with information for a deeper interpretation of all layers of newspaper texts"(MAXQDA.com). MAXQDA enabled me to create a series of codes and link the data set associated to this code. An example of this

was the code relating to SLAR meetings, the regularity of the mention of SLARs led to the creation of a code where references to SLARs could be assigned. Occasionally codes appeared to be very similar and this led me to bring the two codes together and rename the code to better describe the data set. Once each data set had been assigned to a code, I was able to isolate each code, and this produced a series of qualitative data specific to that code or theme which I could refer to and include in reporting findings.

In the unexpected second phase of my research, data was gathered from four interventions. The first intervention, a demonstration and training for all staff in Teams from Office 365, in preparation for the transfer of teaching online led to data gathering that was carried out in a pressurised environment as staff faced the immediate transfer of teaching online due to school closure arising from the COVID-19 pandemic. Feedback from teachers was noted during and after the intervention by members of CARC. The members of CARC held a quick meeting following this first intervention to analyse and discuss the key outcomes from data gathered. This led to the decision to plan the next intervention following a request from staff for some form of online or phone support during the initial two-week school closure. We, the members of CARC, agreed to provide this to staff. As a result of our provision of this support over a two-week period, members of CARC met online to review the intervention and discuss what data we had gathered from the process in providing this support. We realised that the feedback we had collected, highlighted that teachers were having contrasting experiences which was impacting their ability to provide the level of online teaching required. We believed that it was critically important to gather details of teacher experiences during this unique time and agreed to conduct a third intervention in the form of a Post Closure Teacher Evaluation Survey of COVID-19 Online Teaching and Learning 2020. This was followed by a fourth intervention a Post Closure Student Evaluation Survey of COVID-19 Online Teaching and Learning 2020. Using, Forms from Office 365, we conducted these surveys which were predominantly qualitative in their approach.

I implemented a similar form of data analysis as I had in phase 1 of this For this phase, data had been gathered data through online surveys. Both were predominantly qualitative surveys. The process of data analysis began by using the "create a report" function, in the survey software which provided me with a report detailing the responses to each question. I studied these responses to begin to familiarise myself with data gathered, taking note of what

I could see emerging at this early stage. Key terms associated with positive and negative experiences were noted. Following this I used the "export to excel" function, which enabled me to create an excel file, where I could see the survey responses to each question clearly presented. I familiarised myself with survey responses and looked closer for emergent themes. One theme that emerged at this stage of analysis of the Teacher survey was "student non engagement". This theme emerged clearly as it was repeated regularly throughout the whole data set. Following this stage, I repeated the process of uploading the excel file to MAXQDA where I was able to again create a series of codes and link the data set associated to this code. Codes that arose from the teacher survey included "better insight into their students' ability" and "the issue of time". Repeated mention of these themes led to the assignment of a code for each theme. Codes that arose from the student survey also included "time" and "the overload of assignments". Again once I had all data coded, I was able to isolate each code to produce a series of data specific to the code. This enabled me to detail relevant data pertaining to each theme in reporting on findings.

5.15 Validity and Reliability

When it comes to examining validity and reliability in action research, Herr & Anderson (2005), suggest that action researchers, are interested in whether knowledge generated from their research is credible or trustworthy, but they are usually interested in outcomes that go beyond knowledge creation. In the case of my research study teachers underwent an extended period of constructing ICT knowledge in social settings which, we the research committee, CARC supported and guided in an effort to increase their use of ICT in teaching. Knowledge building was therefore extremely important to this study but critical to its success are the outcomes that came from their ICT knowledge growth and creation. Action research has its own tradition of validity that honours the local context (Herr and Anderson 2005). In carrying out this collaborative action research, as a member of CARC, I worked with my colleagues to ensure that the data gathering methods and analysis methods produced data that reflected the reality under investigation. I undertook thematic analysis of this data. which provided me with a highly flexible approach that could be modified for the needs of my study and which provided a rich and detailed, yet complex account of data (Nowell et al. 2017). I was aware too that, this flexibility, can lead to inconsistency and a lack of coherence when

developing themes (Holloway and Todres 2003). It was therefore necessary that I took time and careful examination of the data in identifying and developing the themes during analysis. Given the range of participants at different stages of this research, my adoption of thematic analysis was a useful method for examining the perspectives of these different research participants, enabling me to highlight similarities and differences, and generating unanticipated insights (Braun and Clarke 2006).

In the collection of research data, it is important that the results from this data "reflect the real variations as accurately as possible" (Middleton 2019, 4). In order to do this I have considered the validity of my research under the following headings; descriptive, interpretive, volunteer and participant validation validity.

Descriptive validity

"This refers to the factual accuracy of the account as reported by the researchers" (Johnson 1997, 1). The key questions addressed in descriptive validity are: Did what was reported as taking place actually happen? Does the report reflect exactly what the researchers saw and heard? In other words, descriptive validity refers to accuracy in reporting descriptive information. Validation of the reporting of descriptive information was undertaken by me, the researcher and members of the CARC.

Interpretive validity

> *"While descriptive validity refers to accuracy in reporting the facts, interpretive validity requires developing a window into the minds of the people being studied. More specifically, it refers to the degree to which the research participants' viewpoints, thoughts, feelings, intentions, and experiences are accurately understood by the qualitative researcher and portrayed in the research report" (Johnson 1997, 2).*

This type of validity required me as the researcher to make sure that I, together with my CARC colleagues, accurately understood the range of qualitative data we had collected from our research participants. In the dialogic stages of data gathering, we would ensure that what we were hearing, in terms of responses, from the participants was recorded with accuracy. We would ask questions to gain further clarity on statements they had made to ensure we had noted their response correctly. Always before finishing a dialogic data gathering meeting, we

would voice a summary of what we had heard and noted to the volunteers to gain their consent on what had been recorded. In the analysis of qualitative data, gathered from a number of surveys we undertook it was important that we as a committee examined responses to clearly determine what exactly the participant had meant in a response. This collaboration with my colleagues from CARC, provided me, the lead researcher, with a critical friend support to data interpretation and analysis.

Participant validation.

"The method of returning an interview or analysed data to a participant is known as member checking , and also as respondent validation or participant validation" (Birt et al. 2016, 1802). Survey data generated from the Teacher Survey, "the use of Digital Technologies in Teaching and Learning 2019" was critical to providing my research with direction in terms of creating and planning action interventions. In order to fully validate this data, I with the other members of CARC held a participant validation focus group meeting with volunteers from the staff. This meeting provided us with clarification and further validation of the data from members of the teaching staff and enabled me to progress in refining my research question and developing a plan to undertake a series of action research interventions. "The trustworthiness of results is the bedrock of high quality qualitative research. The data generated from this survey and its analysis was critical to informing the next steps in my research process. According to Ziomek (2019), participant validation allows for opportunities to correct errors that were perceived as flawed interpretations and to summarise preliminary findings.

5.16 Potential Ethical Issues regarding this Research

O'Brien claims that because action research is carried out in real-world circumstances, and involves close and open communication among the people involved, the researchers must pay close attention to ethical considerations in the conduct of their work (O'Brien 1998). "Since mixed methods research combines quantitative and qualitative research, ethical considerations need to attend to typical ethical issues that surface in both forms of inquiry" (Subedi 2016, 575).

My role as researcher and member of senior school management where this study required me to address ethical considerations that could have arisen. I am an insider researcher. I am no longer a teacher, but management and my biases are based on my strong belief that the use of ICT in teacher practice does enhance teaching and learning. I was very aware that my approaches to this research required me to maintain the highest ethical stance I could. As the ethical guidelines provided by the British Educational Research Association (BERA 2011) highlight, the whole research process of education research was required to be undertaken within an ethic of respect for people, knowledge, democratic values, the quality of educational research and freedom. In line with these guidelines (BERA, 2011) I secured ethical approval from Maynooth University and the school where this research was carried out before commencing my study, I ensured participants that their data will be kept in a secure storage area within the school. I secured 'Voluntary Informed Consent' (BERA, 2011) from each of the participants. These included the School Board of Management, Validation Focus Group volunteers, OneNote CBA volunteers and the CARC teacher volunteers (see Appendix K, L, M, N). I emailed these forms to the participants, and to the principal as secretary of the Board of Management. I asked for the forms to be returned to me in person.

"In action research, there are two particular primary ethical concerns: participants' privacy/confidentiality and the researchers' potential abuse of power" (Hinchey 2008, 56). In light of this, I considered four ethical principles developed by Carson et al which I apply to my research approach. Four ethical principles (ATA 2000) developed by Carson et al (1989) include:

1. **"**Ethics of hope: Action research is motivated by an interest in making schools better places for students. Action research should be informed by a concern for the broad range of needs of students and the school community" (Carson and Johnston 2000, 7). In my study Action research was undertaken following the identification of an issue students raised in a student survey that required action to improve their experience of learning.
2. **"**Ethics of caring: At all times, the general welfare of both students and teachers must be kept at the fore" (Carson and Johnston 2000, 7). Throughout the two phases of this research I was very aware of the welfare of teachers and students. The research arose from an issue identified by students. The search for a solution took considerable time in collaboration with teachers to identify a way forward that they would accept and adopt. In the second phase of

this research the general welfare of both students and teachers was central to working in an emergency to support their transfer of teaching and learning online.

3. **"**Ethics of openness: It is important that both the questions and the ways that teacher-researchers work through them are made clear to colleagues and school members" (Carson and Johnston 2000, 8). My collaboration with the CARC was central to ensuring that the approach to both questions in surveys and focus group interviews was clear. The ability to discuss how questions are drafted and potential issues with including them in the process was discussed at meetings and alterations made where required.

4. **"**Ethics of responsibility: The welfare of students and the need to maintain collegiality must be kept in mind at all times" (Carson and Johnston 2000, 8). The welfare of students was central in both phases of this research. The first phase sought to find ways to improve their experience of learning through greater adoption of ICT by their teachers. The second addressed the immediate need students would have relating to learning online due to school closure by the pandemic. I was very conscience, as I am in my everyday practice, to continue to maintain collegiality. Undertaking a research project such as this was going to be extremely difficult without a positive atmosphere of collegiality and I was committed to maintaining this at all times through a collaborative and open approach throughout the research.

5.17 Conclusion

In this chapter, I have set out the details regarding the methodology of action research that I adopted to undertake this study. A full description of the participants who engaged with me over the duration of this study and the importance of their contributions in progressing this research are detailed. I have provided an outline of the methods I used to collect a wide range of data over a two year data gathering period. These methods included surveys, participant validation group meeting, unstructured group interviews, observation and email, which all provided me and CARC with detailed and rich data sets that enabled us to progress with this research. I have outlined how I conducted the data analysis throughout the study and ensured validity and reliability in undertaking all aspects of this research. Finally, I identify the potential ethical issues I may encounter and how I intend to address these as I undertake my study.

Chapter 6: COLLABORATIVE ACTION RESEARCH INTERVENTION PHASE 1

6.1 Outline of this Chapter 6

This chapter sets out the process I undertook in the first phase of this study with my CARC colleagues to address the research question "how can I as a senior school leader, work with teachers to improve their use of ICT in their teaching?" The identification of CBAs in the reconnaissance phase presented CARC, with an opportunity to integrate tools from Office 365, particularly Teams and OneNote, innovatively into a relatively new teacher practice. CARC would provide teachers with the capability to "learn to use" technology while increasing their capacity in technology so that they could "use to learn" in applying it to their teaching and learning practices (Karpova, Correia, and Baran 2009).

This chapter describes how we planned and implemented a series of action interventions through a newly adopted approach to professional development, collaborative apprenticeship framework, in an effort to support teachers to construct knowledge in a social setting which enabled them to create a department OneNote CBA template. As we implemented each intervention, through a cycle of action research, we analysed the results of observation and reflection of participant volunteers, which were gathered during each intervention and at the end through group interviews. Participant feedback led to the alteration of planning for the subsequent phase of action research. The four stages of planning, action, observe, reflect for each intervention are detailed in this chapter. The reflections from me and my CARC colleagues are also detailed throughout this chapter. The following (Fig.11) provides a timeline for phase 1 interventions.

CBA Intervention Timeline

DATE	MILESTONE
Jan-20	Plan and implement **first** of three Action interventions - OneNote CBA template training
Jan-20	Plan and implement **second** of three Action interventions - OneNote CBA template training
Feb-20	Plan and implement **third** and last Action intervention - OneNote CBA template training
Feb-20	CARC **evaluate and reflect** on OneNote CBA Interventions

Figure 11 . CBA Intervention Timeline

6.2 Introduction – OneNote Classroom Based Assessment Professional Development

In this research my aim is to innovate, through in adoption of ICT, both the pedagogical and assessment approach to undertaking CBAs. It is envisaged that through implementation of OneNote, students and teachers can avail of and adopt a whole new innovative technological approach to CBAs and in doing so help to further teacher use of ICT in teaching.

It is important that I therefore state that within this chapter I will refer to decisions and actions undertaken by "us" or "we", the members of CARC but also I want to stress that I was central to these decisions and within this I took responsibility for the planning, the action, the feedback and reflection throughout the action research cycles.

At the end of the reconnaissance chapter, I outlined how we approached the planning of the OneNote CBA Interventions and our plans for these interventions. (Fig. 12) provides an illustration of the three cycles of action research we undertook during this phase of my research.

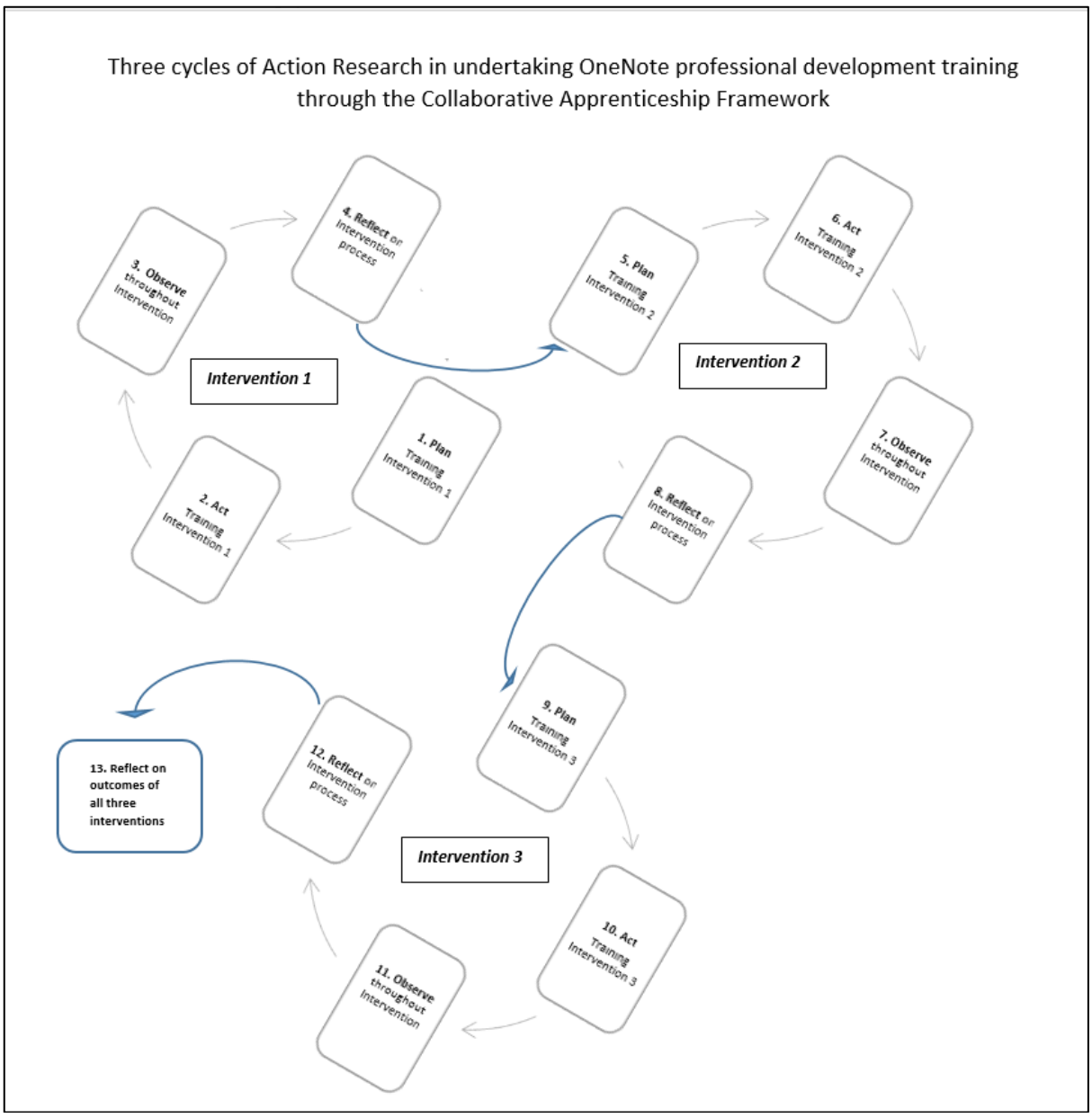


Figure 12 . Three Cycles of Action Research - The OneNote CBA Interventions

6.3 CARC Planning CBA Intervention Training Day 1- 31st January 2020

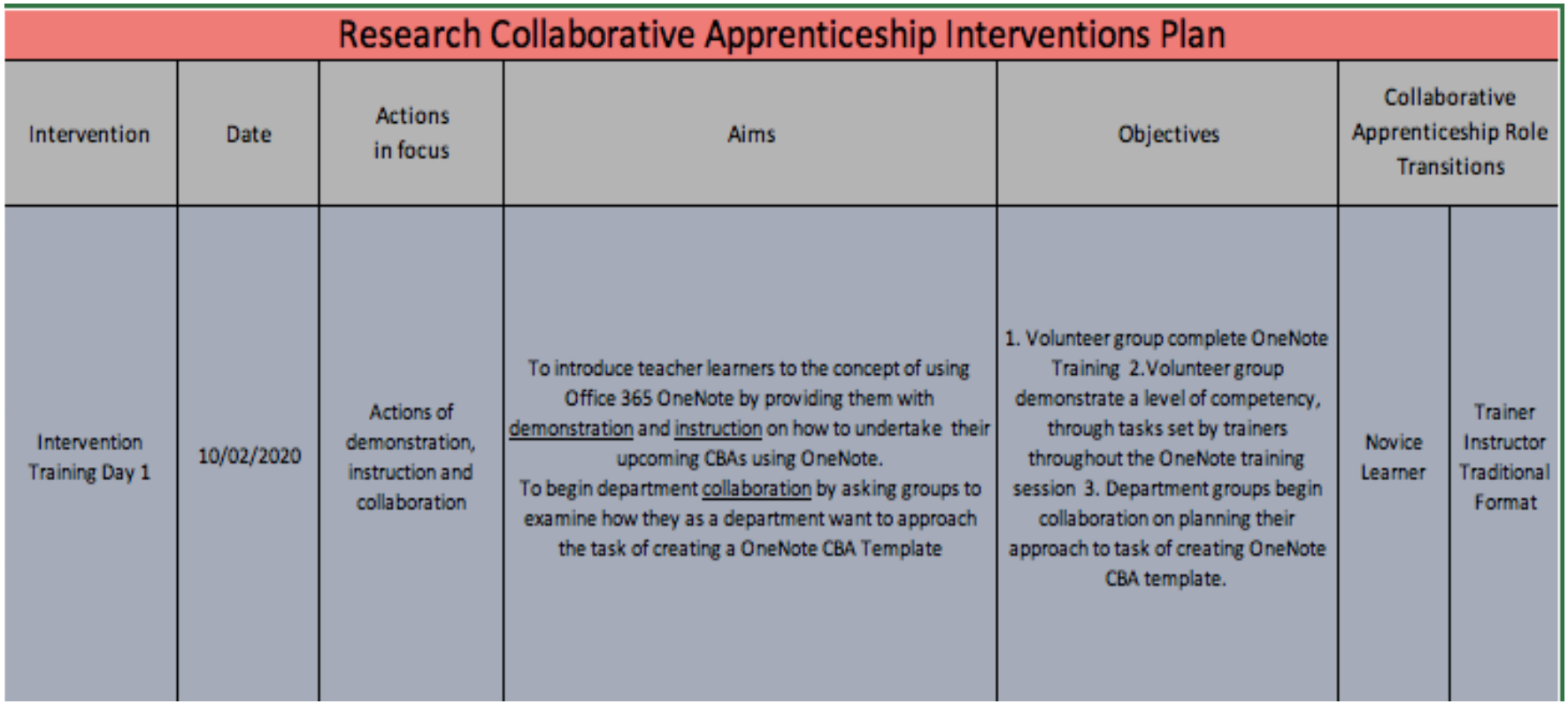
As we were now clear that our action research would take the format of three ICT professional development interventions, we as a committee met to finalise planning for our first CBA Intervention training day. Prior to this meeting I had created a draft plan of each of the interventions. At our CARC meeting, I introduced this draft plan (Fig. 13) to the members and suggested that it would be important to outline this plan to volunteers at the start of the first intervention so that they could clearly understand the research process they were about to participate in. The plan (Fig. 13) detailed each intervention in terms of date, key actions, aims, objectives. In addition, it focused on our chosen ICT professional development framework, the collaborative apprenticeship model and provided a detailed outline of the expected stages of role transition per intervention for learners and trainers. I suggested too that this plan demonstrates to volunteers how much importance was given to their feedback and suggestions gathered during reconnaissance. This had resulted in the adoption of an ICT professional development framework which we believed addressed teacher concerns such as the need for a greater focus on group learning and collaboration, the provision of ICT training focused on a specific ICT tool, primarily OneNote, to one aspect of current teacher practice. In this case the professional development was focused on department groups with upcoming CBAs learning and creating together a department CBA OneNote template that all could use with their students in the near future. In addition, I stressed to my fellow committee members the importance of the reflective nature of our selected research methodology "action research" and how observations and reflections from volunteers would directly feed into the planning for the following intervention. The committee were satisfied that we adopt this plan and present it to volunteers as suggested earlier. The following is the Research Collaborative Apprenticeship Interventions Plan 1, 2 & 3 presented to volunteers at the start of the first intervention.

Research Collaborative Apprenticeship Interventions Plan 1, 2 & 3						
Intervention	Date	Actions in focus	Aims	Objectives	Collaborative Apprenticeship Role Transitions From	To
Intervention Professional Development Day 1	10/02/2020	Actions of demonstration, instruction and collaboration	To introduce teacher learners to the concept of using Office 365 OneNote by providing them with demonstration and instruction on how to undertake their upcoming CBAs using OneNote. To begin department collaboration by asking groups to examine how they as a department want to approach the task of creating a OneNote CBA Template	1. Volunteer group complete OneNote Training 2.Volunteer group demonstrate a level of competency, through tasks set by trainers throughout the OneNote training session 3. Department groups begin collaboration on planning their approach to task of creating OneNote CBA template.	Novice Learner	Trainer Instructor Traditional Format
Intervention Professional Development Day 2	28/02/2020	Actions of collaboration, facilitation and interdependence	To support department group collaboration and encourage teachers to engage in sharing knowledge to promote increased group learning in their planning and undertaking of the task.	1. Teacher groups to begin fully working together, collaborating on OneNote task. 2. Discussing aspect of OneNote and seeking clarity from each other on how to use aspects of the tool. 3. Seeking support from trainer particularly early in the intervention. 4. Becoming much less reliant on the trainer by end of intervention and more interdependent as a group.	Developmental Learner	Trainer Instructor transitioning to Facilitator
Intervention Professional Development Day 3	06/03/2020	Actions of collaboration, increased interdependence and emerging signs of department groups evolving into Communities of Practice.	To support subject groups through facilitation as they engage in working collaboratively on completing their OneNote CBA Template	1. Group collaboration now embedded in practice. 2. Groups display a deeper sense of commitment to the practice of completing their shared task that reflect a community approach. 3. OneNote skill competency levels have increased for all.	Proficient Learner	Facilitator

Figure 13. Research Collaborative Apprenticeship Interventions Plan 1, 2 & 3

This plan details the three planned interventions for the CBA OneNote Professional Development training the CARC created utilising the collaborative apprenticeship framework. It comprises of seven columns titled Intervention, Date, Actions in Focus, Aims, Objectives, Collaborative Apprenticeship Role Transitions - From & To. The first column presents Intervention 1, 2 and 3. This is followed by the date of each intervention. The third column refers to the "Actions in Focus". These actions are linked to our chosen professional development model, the collaborative apprenticeship framework, and are in focus in specific periods, as outlined in the plan, over the three interventions. The actions in focus refer to

instruction, collaboration, facilitation, interdependence with the possibility of emerging as communities of practice. The aims of each Intervention are directly related to the combined strategy of our chosen ICT professional development model and what we as a committee created, following reconnaissance as our action research strategy, focusing on training teachers to apply Teams and OneNote Office 365 tools to undertake their upcoming classroom based assessments (CBAs). The direction of our approach to this would be teacher ICT professional development training in a small group department setting providing training in a more collaborative way to enable teachers to initially learn the technical aspects of Teams and OneNote. Then working together in their small department groups sharing learning and expertise in creating a OneNote CBA template that they could use with their classes in upcoming CBAs. The next column outlines the objectives for each intervention. These objectives are directly linked to the aims and actions in focus and refer to the actions required and intentions such actions should achieve for each intervention. The final two columns refer to the stages of role transition expected as volunteers and trainers progress from intervention 1 to 3. These transitions are those proposed by the collaborative apprenticeship framework as learners and trainers progress through the framework.
This intervention (Fig. 13) would focus mainly on the introduction of volunteers to OneNote. An initial refresher training would be provided on Teams and following that the trainers would bring volunteers through a step by step guide of how to use OneNote. This would be followed by a demonstration and training on how to create a OneNote template. Towards the end of this intervention department groups would have a short time to discuss ideas for their OneNote template. Finally I would hold a group interview with the volunteers to gather their feedback on this intervention.



Research Collaborative Apprenticeship Interventions Plan						
Intervention	Date	Actions in focus	Aims	Objectives	Collaborative Apprenticeship Role Transitions	
Intervention Training Day 1	10/02/2020	Actions of demonstration, instruction and collaboration	To introduce teacher learners to the concept of using Office 365 OneNote by providing them with demonstration and instruction on how to undertake their upcoming CBAs using OneNote. To begin department collaboration by asking groups to examine how they as a department want to approach the task of creating a OneNote CBA Template	1. Volunteer group complete OneNote Training 2.Volunteer group demonstrate a level of competency, through tasks set by trainers throughout the OneNote training session 3. Department groups begin collaboration on planning their approach to task of creating OneNote CBA template.	Novice Learner	Trainer Instructor Traditional Format

Figure 14. Research Collaborative Apprenticeship Intervention Plan 1

6.4 Intervention 1 – 10th February 2020

I began by welcoming the teacher participants which for the purpose of this study I will refer to as volunteers. I thanked them for volunteering to participate in this research. I began by presenting them with the overall plan for this study which is referred to as the Collaborative Apprenticeship Intervention Plan 1, 2,& 3. (Fig. 13) I explained that we intended to roll out this ICT professional development, in OneNote, in three stages which we would refer to as interventions and that we would provide a one page OneNote guide sheet as an extra support during training. We would also demonstrate how to create a OneNote CBA templates so that they could get a better understanding of the task ahead. Taking each intervention, I explained how we would carry out this training, and our research, through an action research process while adopting the collaborative apprenticeship framework to undertake ICT Professional Development Training in OneNote to create a subject specific OneNote CBA template . I provided a brief explanation of each column in the plan to present volunteers with an overall understanding of the process we were about to undertake. I mentioned that there would be a short recap on the use of Teams but emphasised that the early key focus of this first action intervention would on increasing teacher capability in the use of Teams and OneNote. This would be followed later with a concentration on building their capacity to use Teams and OneNote pedagogically through their application in devising a shared OneNote CBA template.

The two CARC trainers began training by distributing the one-page OneNote guide referenced earlier (see Appendix J). They referred to (Fig . 14), the plan for this first intervention to make sure volunteers understood the focus of this first intervention. During the training it became apparent that there were different levels of ICT competency among the volunteers. Some volunteers needed extra support provided by the other CARC members present. Following the OneNote training, we provided an opportunity for department groups to sit together to reflect on their experiences of this first intervention. I then asked for the volunteer group to share their discussions with us.

A brief summary of feedback

The feedback and observations from the volunteers can be summarised into three key points. The first point related to the positive reaction volunteers expressed regarding the structure of

OneNote as a digital tool. In addition, how through department collaboration OneNote can provide a digital framework for undertaking CBAs, with their students, which volunteers deemed would be an approach considered of high standard and one that would appeal to the inspectors from the Department of Education. The second point referenced the standardisation this approach provides in assessing subject specific CBAs. This, therefore would provide a department approach to CBA assessment rather than individual teachers having individual approaches to assessing their own CBAs. This was a new direction for each subject department and something they had not engaged in prior to this. The third point focused on the positive outcomes for teachers and students. OneNote provided students with greater flexibility in how to approach their CBAs. The ability to store student CBAs in a variety of formats from voice recordings, to short videos provided students with the opportunity to be creative and innovative in their projects. For the teachers the ease of access, the ability to assess students digitally while they present their project and the potential OneNote offered for both formative and summative feedback would be extremely welcome by the volunteers.

Findings

The following outlines the findings, analysed according to analytical themes, through data gathered in this first intervention.

OneNote Structure, Department Collaboration & Improving Standards of Assessment

One volunteer explained that he liked that as a result of this training each department would have a digital shared structure to undertaking their subjects' CBAs.

> *"I found OneNote and its structure to be an ideal way to showcase to the Department of Education Inspectors just how we as a department are undertaking CBAs. The fact that we as a department are collaborating in developing a plan and CBA template should be seen by the Department of Education in a positive light".*

He believed that OneNote collaboration had given him and his colleagues a sense of purpose in creating a plan that they all would use. The reference to the Department of Education's reaction indicates that adopting this digital collaborative approach to student assessment is something the department inspectors would look favourably upon. In addition to this it

suggests that collaboration to this level is a relatively new experience for these teachers highlighting just how little time teachers spend in sharing and planning practice. It indicates that there is still a culture of teachers working independently. This was especially reflected by a comment made by a volunteer who stated;

> *"It is very welcome opportunity to collaborate with my department colleagues on an aspect of practice which is new to us all. I was unsure of how to plan for my upcoming CBAs and this has really come at the right time".*

This was encouraging to us as it suggests that our model of ICT professional development was having an impact by encouraging volunteers to collaborate, construct ICT knowledge in their social group on shared practice and enabling volunteers in their department group to create a solution to the issue of how to plan for upcoming CBAs. In creating this solution volunteers were also planning to adopt and integrate ICT into their teaching, the key aim of our research.

A New Experience in Agreed Assessment

The point that for the first time each department had a shared approach to assessment was raised by one volunteer. *"I think that this approach will demonstrate that as a department we now have standardised testing and assessment".* What is interesting about this response is it again suggests that this is not a common teacher practice. From my experience and that of the other members of CARC we were aware that there were different levels of collaboration occurring within departments but none that take the format that participation in this research provides. Malone and Smith (2010), found in their research prior to involvement with their project, "teachers largely acknowledged their in-school conversations around pedagogical issues which were informal, infrequent, mostly unstructured and rarely enough informed by ideas of active professional collaboration on teaching and learning issues" (Malone and Smith 2010, 108). This study enabled department colleagues to work together and focus on a department approach to assessment. One volunteer offered this response;

> *"Assessment now becomes something we as a department, through participation in this research, will now spend time focusing on removing it from something we do as individuals in our practice to something we will do together".*

These comments suggest that within the first intervention volunteer teachers have realised the possible advantages of spending more time as a department collaborating on aspects of their practice. In fact, these comments provide great hope for the possibility that changes to department collaboration is being considered. It is interesting, that even though the primary aim for this research was to work with teachers to increase their use of ICT in teaching, it was becoming evident that concurrently a further outcome was the value volunteers gave to collaboration, especially in planning and addressing aspects of their shared subject practice.

The Positive Benefits to Adopting OneNote

The next point referred to the potential benefits volunteers considered regarding the adoption of OneNote and teacher/student practice. *"As a department it will make teachers and students lives less stressful".* The point being made here was that the use of ICT would bring positive outcomes to undertaking CBAs and reducing stress levels of not only teachers but for students. This was extremely encouraging however, not all volunteers were so persuaded to the benefits of adopting OneNote. One teacher commented

> *"I think it will take a lot of planning and practice before I would be ready to use OneNote with my class. I, personally, believe in the short-term, adopting OneNote will be stressful for me".*

This highlighted the varying levels of ICT competency within the group. In terms of our lens relating to the diffusion of innovation, it is evidence that within this group of volunteers that there were adopters who ranged from early adopters to those who were reluctant participants. It was for this reason in the reconnaissance phase that teachers sought a new approach to ICT professional development, so that all participants would feel included and experience a sense of community support within their department group. This finding reflects and validates the approach we adopted and the possible advantages of approaching professional development in a collaborative way to help support the construction of knowledge of all department members.

I asked the volunteers if they had any suggestions or requests that we needed to consider in the plan for intervention 2. The suggestion that we start with a short recap of the technical training of OneNote at the start of intervention 2 was made by one volunteer due to the long break between the end of intervention 1, and start of intervention 2. This was supported by a

number of volunteers in the group and agreed by us. Given the nature of our research approach, action research, we were able to adjust intervention plans to suit the needs of our volunteers.

CARC Reflections

Following the first intervention my two colleagues from CARC and I discussed our thoughts and reflections. These can be summarised as follows:

Volunteer Engagement, Enthusiasm and Reduced workload

Volunteers expressed a keen interest in developing their learning of OneNote. The trainers and I witnessed a noticeable air of enthusiasm from volunteers as they began discussing CBA templates within their subject departments.

Securely storing and accessing CBA student work

Volunteers had been shown just how to construct their OneNote CBA templates by members of CARC. In their feedback it was clear that they had found the demonstration and instruction helpful in understanding what they as department groups would create in the following interventions. Volunteers referred positively to the ability of Teams and OneNote in enabling assessment of student work and how it offered a platform for communicating feedback to students in a paperless platform. *"The fact that we would no longer have to carry large volumes of student work around the school building is a major factor in terms of my willingness to adopt this approach".* Another volunteer pointed to the ability to store student work and the ease of access it provides, *"For me it is the security Teams and OneNote offer in terms of storing my student's work and then the ease of access to it at any time required".* A volunteer who had obviously proficiency in Teams commented

> *"I have been using Teams but have had to download student work before correcting it and then uploading it again. OneNote changes that as I will now be able to view, correct and return student work digitally without having to go through the steps when using Teams".*

This was very positive because this teacher had worked with his students on Teams, he was able to see from the first intervention that OneNote offered him far greater flexibility when

carrying out assessments and shared this with the group. It was evidence that a number of volunteers were already realising the potential the tools of Teams and OneNote could have on their teaching and working with their students in their CBAs.

There were a number of volunteers who even though they could see the effectiveness of using OneNote, felt less confident about being able to reach the skill level required to enable them to use Teams and OneNote effectively. As one volunteer put it,

> *"I am new to Teams and even though I can see the possibilities that exist in using Teams and OneNote, I am worried that the challenge for me will be to become familiar enough with both Teams and OneNote to enable me to use them effectively in CBAs".*

Another volunteer echoed this sentiment

> *"I am a bit daunted by the need for me to gain enough expertise to undertake my upcoming CBAs using OneNote for myself but especially to be able to use it effectively with my students".*

As committee members, we understood that our teachers had varied experience and ICT capabilities that would need extra support particularly in this first intervention, where volunteers had not yet begun their work in department groups. For this reason, we had ensured that all CARC members were present so that we could provide individual assistance to any volunteer who needed it. We were also sure that as department groups came together, these issues would be resolved as volunteers would be able to support each other and construct knowledge together to enable them to gain confidence in using OneNote. Through this collaborative approach teachers should be able to build their OneNote skills together and transition from novice to proficient user over the course of the three interventions and support each other in diffusing OneNote and join those in their departments who appeared to be early adopters to become early majority. "The important role that social co-creation practices have in the professional development of teachers when new teaching and learning practices using novel technologies are adopted" (Ley et al. 2021, 17).

SLAR Meetings

One important aspect of CBA OneNote templates, volunteers suggested, would be the Subject Learning and Assessment Review meetings (SLARs). Part of the CBA process

required teachers from the same subject department to meet to agree on standards of student work. "Subject Learning and Assessment Review meetings enable teachers to collaboratively reach consistency in their judgments of student work against common, external set Features of Quality" (NCCA 2021). There has been much talk within our staff group of issues that can arise in such meetings. One volunteer had commented on what she knew from teachers who had carried out CBAs previously regarding the challenge met in finding agreement in SLAR meeting. *"I know from teachers who have attended SLARs that there have been difficulties in finding agreement in applying levels of assessment to samples of student work".* Another volunteer was quick to suggest that this new approach might result in a different outcome in their SLAR meetings. *"It would seem to me that if we work on an agreed template for carrying out our upcoming CBAs, there should be far less chance of major difficulties arising in our SLAR meetings".* This was interesting as it was an indication that even though this ICT professional development had been concentrated on developing teacher volunteer OneNote skills, and how to apply them pedagogically to one aspect of their teaching practice, the impact of volunteer participation appeared to extend beyond the limit of the intervention. As a result of their participation, volunteers had time to consider not only conducting upcoming CBAs but also looking to the repercussions of the adoption of OneNote, as a department, on the broader CBA framework, particularly regarding the holding of SLAR meetings, which was an added bonus of participation in this research. The fact that volunteers were taking a broader vision to their approach to CBAs indicated that they were finding further reasons to adopt OneNote to carry out CBAs, a positive outcome of this research.

6.5 CARC Planning CBA Intervention Training Day 2 – 28th February 2020

Following consideration of the observations, feedback and reflections from this first training intervention I adjusted the Intervention plan 2 (Fig. 14) to Intervention plan 2 (Fig. 15).

Research Collaborative Apprenticeship Interventions Plan						
Intervention	Date	Actions in focus	Aims	Objectives	Collaborative Apprenticeship Role Transitions	
Intervention Training Day 2	28/02/2020	Actions of collaboration, facilitation and interdependence	To support department group collaboration and encourage teachers to engage in sharing knowledge to promote increased group learning in their planning and undertaking of the task.	1. Teacher groups to begin fully working together, collaborating on OneNote task. 2. Discussing aspect of OneNote and seeking clarity from each other on how to use aspects of the tool. 3. Seeking support from trainer particularly early in the intervention. 4. Becoming much less reliant on the trainer by end of intervention and more interdependent as a group.	Developmental Learner	Trainer Instructor transitioning to Facilitator

Figure 15. Research Collaborative Apprenticeship Intervention Plan 2

Revised Research Collaborative Apprenticeship Interventions Plan 2					
Intervention	Date	Actions in focus	Aims	Objectives	Collaborative Apprenticeship Role Transitions From / To
Intervention Professional Development Day 2	28/02/2020	Actions of instruction, collaboration, facilitation and interdependence	To deliver refresher training to enable teachers who require extra support to increase their confidence and competence in OneNote. To support department group collaboration and encourage teachers to engage in sharing knowledge to promote increased group learning in their planning and undertaking of the task.	1. Teacher groups to begin fully working togethercollaborating on OneNote task. 2. Discussing aspect of OneNote and seeking clarity from each other on how to use aspects of the tool. 3. Seeking support from trainer particularly early in the intervention. 4. Becoming much less reliant on the trainer by end of intervention and more interdependent as a group.	From: Developmental Learner To: Trainer Instructor transitioning to Facilitator

Figure 16. Revised Research Collaborative Apprenticeship Intervention Plan 2

Revised Plan Intervention 2

The revisions are indicated in red script in revised research collaborative apprenticeship intervention plan 2 (Fig. 16). The first addition was made to the Actions in Focus where, as a result of requests from volunteers to provide a recap, to help with their capability and ultimately their capacity of adopting OneNote, an inclusion of additional short OneNote instruction was added. This is linked to the following column as additional aims were produced from this change. These additions state the aim of delivering this refresher training to support increased confidence and competence of OneNote within the volunteer group.

6.6 Intervention 2 – 28th February 2020

The second intervention took place on the 28th of February 2020. In my introduction I explained how, due to feedback from intervention 1, amendments had been made to the original intervention plan to address issues raised by all participants in the research. I presented the amended plan (Fig. 15) and explained each aspect of it, highlighting the amendments in red, that had been made and why. Focusing volunteer attention on these amendments, I began by highlighting the inclusion of "instruction" in the Action in Focus column as a result of a request in intervention 1, from volunteers for a OneNote recap in intervention 2. This was followed by amendments to the aims column with the inclusion of "refresher training session", that had not been considered previously but following intervention 1 had now been included. The original aims referred to providing further trainer support while volunteers focused on progressing their OneNote CBA template relying on each other and growing their interdependence as outlined in the collaborative apprenticeship framework. In doing so, the intention was that volunteers would progress in their capability to use OneNote from novice learners, where they have no specific knowledge of OneNote, to experts learners who have a broad and deep understanding, capability and capacity to apply OneNote not only to undertaking CBAs but across their practice in general.

As researcher, I stressed the importance of participants sharing observations and feedback at the end of each cycle to enable me and my CARC colleagues to adjust each intervention to suit the needs of the group. Intervention 2 would require department groups to work and

collaborate together on the task of creating a OneNote CBA template, guided by the CBA guidelines from the Department of Education.

We began with a short revision of OneNote. The department groups then began working together on their OneNote CBA task. I and the trainers observed their collaborations, providing support when needed. There was evidence, from my observations, that teachers were sharing knowledge and discussing best approaches to creating the template. Initially the groups looked to the trainers for clarification on technical aspects of OneNote or to look for guidance as to how to do certain additions to the template (from formatting to uploading pictures or documents) but as the intervention continued, their capability and capacity in the use of OneNote was clearly growing as they seemed to need this support less. Department groups appeared to be fully engaged and socially constructing and sharing knowledge together not only on how to use OneNote but also how they could include the CBA guidelines particularly the features of quality relating to their subject. It was evident that the team facilitators from each team were taking on the role of opinion leaders and interacted regularly in supporting their department colleagues in encouraging their OneNote skill building. They provided an extra layer of technical support to their department which enabled interdependence to evolve. Signs of interdependency were observed, especially towards the end of this intervention. We noted this, as we observed teachers reaching the stage of being able to support each other through collaboration and at times feverish exchanges with each other.

Through observation I was keen to see indications that department groups were displaying signs of community formation. Community formation occurs when the process established by collaborative activity empowers learners to take on the responsibility for their learning processes (Thomas 2009). We were hopeful, that if our volunteers within their department group displayed such signs there may be the possibility the group would sustain commitment to collaboration in future. Throughout the intervention I sat with departments occasionally, to see what progress they were making and learn from their experiences of collaboration. The findings of these exchanges now follow.

Intervention 2 – Findings

Significance of Department collaboration

Volunteers were keen to again highlight how participation in this process had provided them with a significant opportunity to engage in department collaboration. As a result, they were keenly aware that their joint interactions and collaborations meant that they as a department would have a digital product, they and their students could use to undertake their CBAs. Comments relating this included

> *"It is important that we all contribute to the design and creation of this CBA template. We are learning together as we develop the template. This will ensure that we are all familiar with all aspects of the template which will be important when it is time to undertake our CBAs using our OneNote template with our students".*

A First for our School

In these conversations, it was pointed out that this was the first time that subject departments in our school had collaborated, in a designated process, that had enabled them to produce an agreed digital strategy which they could adopt to one teaching strategy. Prior to this set of interventions the volunteers commented;

> *"Participation in this OneNote training now means that instead of each of us having our own approach to CBAs we now have a department collaborative digital approach which is innovative and hopefully more engaging for our students".*

Towards the end of the session, I again held a group interview with the volunteers and asked them for their reflections of this intervention.

Collaboration

Volunteers referred to a recurring theme in feedback from the group regarding collaboration; *"what is really evident is we must work collaboratively, talking to each other, not individually, as a department to agree on our template".* From participation in this research,

departments were experiencing the benefits of this type of collaboration. The shared approach to undertaking CBAs clearly meant that departments could together remove the stress and workload teachers felt individually in planning and undertaking their CBAs. This does point to the fact that teachers do generally work independently but now, as a result of participation in this research, voiced a desire for this to change.

Structure and Format

This approach provided teachers with a structure and format for working together within their departments. One volunteer commented on this;

> *"We need a structure and format. It will cut down on paperwork and help with the correction. We will hopefully have a unified marking scheme. It will also provide evidence into the future on what is being submitted and what is the standard we have set".*

From this response it is clear that there were a number of advantages resulting from the adoption of their OneNote CBA template such as the reduction in paperwork for teachers and the format of their template which provides all department members with a clear understanding of how to approach their CBAs. Within this volunteers department members are going to be able to agree a unified marking scheme which will make the whole process of SLARs more straight forward and provide equity for students.

Difficulties in arriving at group decisions

The following comment suggests that collaboration was not without issues. *"Putting together the template is the most time consuming and agreeing on content but once these are in place, we will be ready to go".* It is clear that collaborating and agreeing on a department CBA template took more time than expected. The Mathematics department had found the guidelines outlined by the Department of Education to be vague. One of their department explained

> *"as a department we are struggling with the lack of detail in the CBA guidelines provided by the Department of Education. This has impacted on our progress today. We have not yet had (JCT) Junior Cycle training as other subject groups have had but we are scheduled to attend this training before the next Intervention date and therefore are hopeful we will be more informed on the content for our OneNote CBA template".*

This lack of clarity led to some differences in opinion regarding how the group should proceed. Following a lengthy discussion, the group reached agreement on what aspects of their CBA template they could agree on and believed that following their scheduled JCT training they would be in a better place to progress and complete their template. This issue was highlighted by another volunteer who also referred to the issue of time and preparation required prior to template construction. *"Preparation is taking more time at the moment, but it will save us when we start running the CBAs. We are not very clear how long or how short the CBA is to be".* Both departments before launching into the OneNote design had to collaborate and find agreement on what as a department they wanted in terms of CBA template content and design.

Traditional approach V OneNote approach to CBAs

Volunteer responses led me to ask, *"If we hadn't introduced you to this OneNote CBA strategy how different would your approach have been to undertaking CBAs?"* One volunteer responded*; "I think we would not have collaborated to the level we have now". This collaboration has meant we can get down to the nitty gritty detail".* Again, the reference to departments not undertaking planning collaboratively is highlighted. Teachers would have approached planning for CBAs individually as they tended to work individually rather than as a team. When teachers work independently, the degree of planning and preparation will be varied. This will have an effect on the end result. It is evident that without an agreed department approach to a practice such as CBAs, students will have mixed experiences of how their teacher approaches undertaking CBAs. Student learning will also vary from teacher to teacher. CBAs form part of the Junior Cycle Assessment regime and it is therefore even more critical for departments to collaborate to form an agreed approach that delivers fairness and equity for all students.

Benefits of OneNote CBA

I then asked *"What do you think the benefits will be of doing CBAs in this way?* One volunteer offered the following reflection*; "The potential of having high volumes of paper is sorted by OneNote and so too is the benefit of having everything stored securely online".* This related to the issue where student assessment often results in teachers collecting student

work, several scripts, and transporting them to and from home for correction. Teachers often teach over six groups of students in any given school day. The volume of student work can be challenging to transport to and from school. A further advantage identified by her is the more recent challenge encountered by teachers regarding the issue of storing student work securely. Issues relating to GDPR have posed challenges for teachers in recent years and therefore digital approaches such as OneNote provide teachers with solutions to some of their everyday problems. For this volunteer using OneNote offers these great benefits. The following teacher comment suggests that he is an opinion leader.

> *"If all staff were to adopt this method it would benefit our students greatly. I think it would be great if our group could roll this training out to the next group of teachers who are planning their CBAs. This will help to increase the number of teachers using OneNote in undertaking their CBAs".*

His eagerness to engage in expanding this training to his colleagues confirms how he was convinced by what he had observed and experienced of the CBA OneNote approach and its benefit to students. This was something I had hoped that might potentially occur and would mean CARC could pass on the role of training to volunteers from this study to train the next new group of teachers. For this research it was an indication that there was a growth in opinion leaders, from the original two team facilitators, and this was very encouraging. This is the fabled tipping point, where the rate of adoption rapidly increases" (Orr 2003, 4). This suggests that with increased opinion leaders in our staff the future diffusion of adopting OneNote to carry out CBAs, within the larger staff group, will be greatly increased. It was also a confirmation that we were progressing in our research aim of working with teachers to increase their use of ICT in teaching.

Possible signs of the formation of a Community of Practice (CoP)

The next comment came from a volunteer who referred to her wish for collaboration to extend beyond these three interventions and how participation *"will hopefully give us a clear starting point for carrying out CBAs and with further collaboration we can reflect and revise our template to get it to a standard we will all be happy with".* She believed that what would be required of the members of each department, following completion of all three interventions, is ongoing collaboration and engagement to be continued as members continue to learn and share knowledge that will benefit themselves and their students. This suggested

the possibility of teachers forming Communities of Practice (CoP). “Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (*Wenger-Trayner* and *Wenger-Trayner* 2015). This volunteer’s comments suggests that she believes this is something her department should strongly consider. She explained that the template departments created will need amendments as teachers undertake their CBAs. As a result continued collaboration will be needed as teachers identify aspects of their template that require revisions or additions to further improve teacher and student experience of CBAs.

6.7 Volunteer feedback re: Planning Intervention 3

As we came to the end of our feedback group discussion, I asked the volunteers if they would like me to include anything in particular in the planning for the final intervention. They responded that no further additions would be needed in intervention 3. Department groups indicated that they were ready and keen to work independently without any major support from the facilitators. One volunteer did request that one facilitator be available to provide occasional support. This is significant, as it again indicates that despite now having completed two interventions, anxiety issues regarding competency still existed for some volunteers. It was an important finding for us the CARC members as it yet again highlights the challenges teachers experience in adopting this new ICT practice, the support they require, and how each volunteer had their own individual transition, relating to our framework, from novice learner to proficient. It was essential that this volunteer and others, who were experiencing the same anxiety were supported fully in their growth in competency. I agreed that we would organise this support for the third and last Intervention on the 6th of March 2020.

CARC reflections

The actions in focus we had set out for intervention 2 had been on collaboration, facilitation and interdependence. In our own reflections as CARC members and taking into account the reflections from the volunteers it is clear that some aspects of participation in this intervention had been rewarding.

Collaboration

Volunteers were keen to stress the benefits they experienced in collaboration. The intervention provided for volunteers, with their departments, to construct knowledge collaboratively, share practice, start creating a structure and solution, in the form of a OneNote CBA template, to the problem of how they would undertake upcoming CBAs with agreed standards.

Structure and Format

This template was a structure that was new in its approach to assessment and addresses issues relating to GDPR, embedding the use of ICT to the benefit of students and teachers.

Challenges arising

It was also clear that participation in this intervention had been challenging for some volunteers more than others. This approach required volunteers to change practice. Volunteers firstly had to adjust to undertaking a new practice in the form of CBAs and secondly, there was now the additional challenge to adopting an ICT approach to undertake this new practice. Issues arose regarding the lack of detail in CBA Subject Department of Education guidelines, particularly for the Mathematics group, which proved to be an additional challenge and led to complications and delays.

6.8 CARC Planning CBA Intervention Training Day 3 – 6th March 2020

Following consideration of the observations, and feedback from Intervention 2, amendments were made to the original plan for Intervention 3 (Fig. 16) to an amended plan 3 (Fig. 17).

Research Collaborative Apprenticeship Interventions Plan 3					
Intervention	Date	Actions in focus	Aims	Objectives	Collaborative Apprenticeship Role Transitions From / To
Intervention Professional Development Day 3	06/03/2020	Actions of collaboration, increased interdependence and emerging signs of department groups evolving into CoPs (Communities of Practice).	To support subject groups through facilitation as they engage in working collaboratively on completing their OneNote CBA Template	1. Group collaboration now embedded in practice. 2. Groups display a deeper sense of commitment to the practice of completing their shared task that reflect a community approach. 3. OneNote skill competency levels have increased for all.	Proficient Learner / Facilitator

Figure 2. Research Collaborative Apprenticeship Intervention Plan 3

Revised Research Collaborative Apprenticeship Interventions Plan 3						
Intervention	Date	Actions in focus	Aims	Objectives	Collaborative Apprenticeship Role Transitions From	To
Intervention Professional Development Day 3	06/03/2020	Actions of heightened collaboration and increased interdependence. Departments displaying tentitive signs of CoPs i.e.(domain - shared identity as collaborative CBA Dept group), community (their engagement in activities of dicussion, learning, applying OneNote required to produce their CBA template) and practice (sharing of resources to produce OneNote CBA template) r	To support subject departments through reduced facilitation as they engage fully with each other in creating their OneNote CBA template. To enable departments to work independently together without any major interventions from CARC members (other than facilitation as above) so that volunteers within these departments can focus on their task contunue to build relationships, community formation and a shared sense of	1. Group collaboration now fully embedded in practice. 2. Groups display a deeper sense of commitment and togetherness to their practice. OneNote CBAs templates completed 3. OneNote skill competency levels have increased for all.	Proficient Learner	Facilitator

Figure 18. Revised Research Collaborative Apprenticeship Intervention Plan 3

The following amendments and addition were included in the revised plan for intervention 3.

6.9 Amendment 1: Community formation - Communities of Practice.

From our observations and reflections of intervention 2, we believed that there was a clear shift in engagement during intervention 2. Department groups were growing in cohesion and displaying a greater sense of togetherness in undertaking their joint task. “In recent literature, communities of practice (CoP) represent a promising theme in the professional development of teacher educators (Parker, Patton, and Tannehill 2012). We wondered if this too was a promising theme for teacher learners and if our volunteer collaboration could go beyond participation in this research where they could be self-sustained as a CoP ? Our desire for department groups to progress collaboration to form CoPs stems from the benefits of such engagement relating to teacher knowledge and learning. In addition “a growing number of people and organizations in various sectors are now focusing on communities of practice as a key to improving their performance” (*Wenger-Trayner* and *Wenger-Trayner* 2015).

As a result we decided to add to the Actions in Focus column the following; “Departments displaying tentative signs of CoPs i.e.(domain - shared identity as collaborative CBA Dept group), community (their engagement in activities of discussion, learning, applying OneNote required to produce their CBA template) and practice (sharing of resources to produce OneNote CBA template). We could see from the interactions and feedback we had received that there were small aspects of domain, community and practice being established with the department groups. Important aspects of CoPs is that they

> *“serve multiple purposes including professional learning, increased research productivity, enhanced instruction, and promotion of school improvement. They seek to break down walls of solo practice and create spaces where faculty members learn from each other, promoting professional growth” (Parker, Patton, and Tannehill 2012, 352)*

6.10 Amendment 2: Less support required from Facilitator

The transition of the volunteers from novice learners to proficient and in some cases expert had been realised for almost all volunteers by the end of intervention 2. Volunteers by now were displaying a high level of capability in using OneNote. It was now clear that their

capacity to apply OneNote to undertaking CBAs had increased. For this reason and resulting from feedback we decided to make a small change in the aim relating to the group's dependence on the facilitator. This change was small but we believed significant. This was to emphasise that rather than the need for facilitators being present for all of intervention 3, the volunteers required a facilitator to provide partial support. Department groups felt they were almost self-reliant at this stage in the process in achieving template completion.

6.11 Amendment 3: Continuing and encouraging relationship building through collaboration

As amendments in the Actions in Focus had been made regarding the actions relating to the formation of communities of practice, we were keen to emphasise and encourage the importance for departments in achieving a greater "sense of togetherness" to promote a greater "sense of community". A deeper level of collaboration was a further objective we added at this stage using the term "embedding of group collaboration" .

6.12 Intervention 3 – 6th March 2020

The third Intervention took place on the 6th of March 2020. In my introduction I provided volunteers with a recap of the professional development framework, we were adopting in these interventions "the collaborative apprenticeship framework". I outlined the link between the transition volunteer learners were making in terms of the OneNote knowledge growth and our progression through the framework. I explained that from our observations and volunteer feedback, we believed that many of the volunteers had transitioned to proficient learners and some may have become expert learners. I did acknowledge that some volunteers, despite increased OneNote skills, still held some anxiety about their OneNote competency, particularly in using their OneNote template in the next few weeks with their students. I suggested that this final intervention should provide them with the opportunity to increase their knowledge and competency by taking advantage of the social context they are in, to seek help and support from their department colleagues to enable them to construct and embed the knowledge they needed to undertake their OneNote CBAs. They also had the opportunity in this intervention to discuss how they intended to implement their OneNote CBA templates in their upcoming CBAs. In addition, I encouraged them to discuss how they could support each other, over the course of this implementation. Referring to the role of the

CARC trainers, I reminded volunteers that the role of the trainers had started with a more traditional approach to training of instruction but now had become facilitational, as a result of volunteers requests to work almost independently. I presented the amended plan of intervention 3 (Fig.17) to the group outlined the amendments and reasons for these (as stated above).

Intervention 3 - Findings

Collaborative Apprenticeship role transition complete

Throughout the session I observed the two departments work on their CBA template (Fig. 18). It was evident to me that both departments were committed and intent on finalising their template by the end of this intervention. Other members of CARC joined me for a short period on occasions to observe this intervention. We observed a strong sense of collaboration and interdependent engagement in each department. The Mathematics department were working together to produce their template. The Geography department appeared to be more relaxed as they made the final edits to their template. They had time to discuss how they planned to carry out their CBAs in a few weeks' time. Evidence of the level of interdependence in both groups came when the CARC members who had provided OneNote training (the facilitators) arrived to see if either department required help. There were two requests for technical clarifications, otherwise the groups were self-sufficient. This indicated that the transition of roles outlined in the collaborative apprenticeship model had been completed.

Relationship building, increased collaboration resulting in future CoPs?

There were signs of active listening, active exchanges of views focused on their shared PC screen that collaboration was leading to greater level of relationship building. The groups were sharing ideas as they sat closely around one computer screen. There was clear evidence of teamwork from observing members take responsibility for obtaining information required for certain aspects of the template. In particular, one volunteer took responsibility for providing input to her group regarding the Department of Education guidelines referred to the "features of quality" She outlined to her fellow volunteers what they would need to include in their CBA templates to satisfy these guidelines. I witnessed through various exchanges key

attributes associated with relationship building that of trust, inclusion and respect. Within both department groups, members took turns in inputting to their computer. In one department group, one member appeared to be hesitant about taking her turn. She made the comment that she might "mess it up for everyone". The remaining members were quick to reassure her that that would not happen and encouraged her, making her feel trusted and included in their group project. As members became fully involved during the creation of the OneNote task, I observed how the levels of communication had increased. This was indicated by the level of exchanges between volunteers sometimes talking to a fellow volunteer and others expressing their ideas of opinions to each other within their group. During these times it was evident that volunteers were actively listening to each other and responding with their suggestions or opinions. From my observations and that of my fellow CARC members who joined me occasionally there was a difference to how volunteers were interacting in this intervention. As an observer I could detect tentative signs of the potential for these department communities to develop in time into CoPs. This was particularly noticeable in their engagement with each other and in their sharing of expertise in an effort to ensure all volunteers felt included in the process of creating their OneNote CBA template.

Findings - Geography Department

Towards the end of this final intervention I met with the Geography volunteers.

Their Geography CBA OneNote Template

At this stage in intervention 3 the Geography department volunteers had their template (see Appendix O). I took the opportunity to learn about their observations and reflections of this intervention and the overall research process they had participated in. The department members showed me and my CARC colleagues their finished template on the screen as seen in (Appendix O). This is a screenshot of an extract of the Geography department's CBA template. This screen contains the "Features of Quality" required by the Department of Education and additionally it provides a further column which the teacher will use when assessing each CBA. The features of quality are categorised a. Exceptional, b. Above expectations and 3. In line with expectation. In assessing the students' work the teacher will select one of these features that best describes the standard the student has achieved. The screenshot also displays the division of CBAs into CBA1 and CBA2 as students over the

course of two years will undertake two CBAs. Within each CBA template students will be able to store their project which can range from a video recording to a photograph of a project display. In addition there is a separate area for the student to write their reflection on their CBA process.

Their thoughts and experience of Collaboration

I began by asking the Geography teachers *"how central was collaboration to this experience and outcome for your department?"* Their responses were *"The biggest thing is that the template has happened because we all sat down and worked on it together".* and *"Collaboration made this happen"..* What is significant about this is just how much importance and emphasis these teachers gave to their collaboration, in producing their OneNote CBA template. They indicate that participation in this process has brought about a new awareness to them of what can be achieved through collaboration. It was evident from their comments that this level of collaboration was new to them and it had only happened because of their participation in this research.

Collaboration & Standardisation

One department member highlighted; *"It means we are all working from the same standard. It provides consistency in undertaking CBAs in our department. This is positive for our students".* It also indicates that these teachers have probably not experienced this type of collaboration as a department but now see what can be achieved when they do. The reference to the "same standard" is significant. It suggests that without collaboration there have been differing standards within a department with regard to assessment as teachers work in isolation of each other.

Collaboration & Consistency

The reference in the previous comment regarding consistency is also important as this new approach means they all will undertake their CBAs using the same process which means that all students will experience the same assessment approach which is important for fairness and equity in assessment of students. This reference to students shows that the Geography department group are not only focusing on an ICT task but on how this task and its outcomes

will impact on students. This is important as they are examining and understanding the positive pedagogical outcomes of this approach to their students.

Collaboration to continue - a possible CoP

It was clear from our exchanges that the Geography department had enjoyed and were excited about implementing their OneNote CBA template in a few weeks' time. They were keen to emphasise that they would continue with these collaborations, not just in amending their CBA Template, but in focusing in on other aspects of the curriculum where they could work and learn together in an effort to improve their practice and raise the standards within their department. All of which would lead to enhanced learning for Geography students.

Findings - The Mathematics Department

Following my discussion with the Geography department, I met with the Mathematics department to learn about their experience of this intervention and the research process in general.

Issue with clarity regarding Features of Quality

The Mathematics Department outlined the issues they had regarding the vagueness relating to the Features of Quality required for their template design. As a result they spent a lot of time exchanging opinions on what should and what should not be included in the template. There was a lot of confusion indicated by this member of the Mathematics department;

> *"This confusion did slow us down and resulted in conflicting opinions on what should be included in the template. It did make collaboration difficult at times. However, because of our participation in these interventions we were very aware of the need to clarify details when we attended the JCT training last week. Participation in this has motivated us to insure we accurately create our OneNote CBA template and realise the strength of collaboration in this process".*

Collaboration leads to address the language of Rubrics

Despite collaboration being difficult at times, this response emphasises how participation in this research focused them as members of a department to address planning for their

upcoming CBAs. They stressed that it was through collaboration in this study, they were able to produce and finalise a OneNote CBA template. A further outcome of their collaboration was a closer focus on the language relating to the Mathematics CBA template which they needed to simplify to support student learning.

> *"our collaboration did lead us to identify one key issue and that was the necessity to address the wording in the Rubric. The purpose of the Rubric was to provide instruction and. guidance to students while undertaking their CBAs. We agreed that we needed to simplify the language in the Rubric to accommodate students of all abilities to understand it".*

This is important as it demonstrated how the department group through their examination of Mathematics CBA requirements were cognisant of difficulties their students might experience in understanding the template.

Collaboration to end on finalising the Mathematics OneNote CBA template

The Mathematics department acknowledged that they had had an overall positive experience regarding their collaborations. Despite this, I did not get a sense, as I had with the Geography department, that they would continue this collaboration beyond these interventions. I asked the group if they would continue their collaboration beyond this set of interventions? There was a clear resistance to this idea and the general consensus was that they had collaborated to produce the template and would now prefer to progress independently in undertaking their CBAs. As one volunteer commented *"I think we have achieved what we set out to achieve through this collaboration, however at the moment I don't see a need to collaborate to this level now that we have our template".* In considering why this was the case it was clear that the two departments who had participated in this research had had very different experiences of collaboration. The Geography department's collaborations appeared to be an extremely positive experience and one that had had no major issues. This positive outcome for these teachers provided the motivation to continue with collaboration beyond these interventions. The Mathematics department had encountered issues which they indicated had made collaboration difficult at times. Because of their lack of progress in intervention 2 there was an urgency on them to produce their OneNote CBA template (Appendix N) within this intervention 3. This might have put additional pressure and tension on the group and as a result they were ready to finish their collaboration at the end of this third intervention.

CARC Reflections

Following intervention 3, we met to discuss our observations and reflections.

Importance of Participation & Collaboration

We noted that both departments stressed that without participation in this study and collaboration, they would never been able to or taken time to produce a jointly created digital solution to undertaking their CBAs.

Valued OneNote CBA Template

What is important about these comments is that even though both departments had a different experience of collaboration to each other, one a very smooth experience the other challenging, particularly in intervention 2, they both were very positive that working together in this way had led to a new approach and produced their valued CBA template.

Equity & Fairness

Another aspect we discussed was how both departments had referenced consideration for their students in relation to their template. For the Geography department they it was the importance of equality and fairness in relation to assessment for all Geography students. The previous practice of individual teachers adopting individual approaches to CBAs did not always provide a fair system for all students in the assessment of their CBAs. . *This they referenced in the statement "It provides consistency in undertaking CBAs in our department. This is positive for our students".* For the Mathematics department it was the issue of wording, particularly in relation to the features of quality. From a student view point changes in the wording from the department guidelines were required to support students in their understanding of each rubric. "*We agreed that we needed to simplify the language in the Rubric to accommodate students of all abilities to understand it".*

Potential CoPs

We next discussed the potential that either group will continue with collaboration and work together with the emergence of a CoP. It was evident from responses from both departments that the potential for this to occur was more likely with the Geography department than the Mathematics department. For an emergence of a CoP, three aspects of group interaction must be present, domain, community and practice. In our discussions regarding both departments we believed that there was signs that departments had established their own identities as a group or domain. Both had shown a community approach with a strong commitment to the CBA task and participation in this set of interventions. However with regard to practice the two departments differed in their intentions of working together in the future in sharing practice and building resources together. The Geography department had indicated their intention to do so leaving this department with the potential for a growing CoP while the Mathematics department had indicated their intention to conclude collaborations and return to their individual approach to practice. This suggests that it is highly unlikely that this department will proceed to forming a CoP.

6.13 Researchers Reflections Intervention 1, 2, & 3

Having completed three training sessions and sought feedback from volunteers on a number of occasions it was clear that the departments had actively participated and in varying degrees collaborated in adopting OneNote as a framework to undertake their upcoming CBAs. Referring back to the research question "How can I as a senior leader work with teachers to improve their use of ICT in teaching?" The results over the course of these three interventions have clearly shown that volunteers have increased their ICT skills particularly in OneNote. They have collaboratively produced a planned approach in the form of a CBA template which they can now integrate into their undertaking of CBAs. This means that teachers will have increased their use of ICT in teaching, both technically and pedagogically, and students will benefit from this new enhanced and innovative approach to learning and assessment.

The research experience of both groups provided an insight into two different collaboration experiences. By Intervention 3, there was a distinct sense of excitement from the Geography

group as they were ready to implement OneNote into their CBAs. They were enthusiastic about working together and fully embedding collaboration as they each carried out their CBAs. This department had established itself as community. Wenger et al. describe a Community of Practice as "a group of people who 'deepen their knowledge and expertise in [an] area by interacting with one another on an on-going basis" (Wenger, McDermott, and Snyder 2002, 4). The way in which this department collaborated, increasing their knowledge and expertise in OneNote and their further commitment to continued collaboration suggest that they have the potential to become a Community of Practice (CoP).

The Mathematics department had in the final session completed their OneNote template. Individually, they appeared enthusiastic about implementing their template in upcoming CBAs, collectively there was no sense of excitement rather a relief to have completed their collective task and eager to return to working individually within their own classroom space. This could have a negative implication for the aim of this research of improving teacher use of ICT in teaching. Collaboration and sharing of resources help to promote sharing of practice. Teachers returning to their default practice of working in isolation will be challenging for ICT integration into teaching. It will only be through greater collaboration and sharing of practice and resources that teachers will be encouraged to adopt new practices such as the adoption of ICT into their teaching.

6.14 Conclusion

This chapter outlined the process which CARC and seven volunteer teachers from the Geography and Mathematics departments engaged in over a series of three interventions focusing on the training and adoption of a new approach to undertaking CBAs. By utilising the collaborative apprenticeship framework, as a new approach to ICT professional development we were able to support the two department groups through this process to collaboratively produce an ICT OneNote CBA template that they as a department could use with their students in their upcoming CBAs. The purpose of this was to address the research question of "how can I as a senior school leader work with teachers to increase their use of ICT in teaching?"

Chapter 7: CHAPTER 7 – A GLOBAL PANDEMIC

7.1 An Unexpected Event - Brief Outline

The impact of the arrival of COVID-19 in Ireland gave rise to an unexpected phase of this research. The following four chapters detail a series of action interventions, we the CARC, undertook as a result of this crisis. The following timeline (Fig. 19) outlines the dates and actions taken during 2020 from February to April, as a result of the first COVID-19 school shutdown.

Phase 2 - The COVID-19 CRISIS

DATE	MILESTONE
28th Feb 2020	**Arrival of COVID-19 in Ireland**
9th March 2020	School Mangement Team meet to plan for the **possibility of school closure due to COVID-19** and a transition to online teaching.
12th March 202	Government announce **immediate school closure from 6pm**
12th March 202	**Intervention 1**- CARC carry out demonstration and training intervention to staff one hour prior to closure. Decision taken to provide support intervention to staff over two week period
12th March 2020- 26th March 2020	**Intervention 2** - CARC provide phone and online support to staff during school shutdown
26th March 2020	Decision taken by CARC, following feedback from the provision of staff support, to undertake **COVID-19 Post Closure Staff Survey of Online Teaching** to gather data on their experience of online teaching.
15th April 2020	On analysis of Teacher Survey re Online teaching, the issue of lack of student engagement is raised. CARC decide to carry out a **COVID-19 Post Closure Student Survey of Online Teaching** to identify why students encountered issues with online teaching and learning

Figure 19. Timeline impact of COVID Crisis in our school

7.2 Brief outline of this Chapter 7

The arrival of COVID-19 in Ireland in February 2020 very quickly led to a series of actions by the Irish Government in an effort to halt the spread of the virus throughout the country.

One of these actions was to close all schools on March 12th 2020, initially for two weeks but this was extended to the end of the school year.

This chapter sets out the process we, the members of CARC, undertook in response to the threat of imminent school closure. We had just, the previous week, on March 6th, completed the implementation of the third OneNote CBA intervention. By March 9th, it was becoming clear that COVID-19 was a real threat to the Irish society and media briefings were pointing to the possibility of school closures. This would require schools to transfer to online education. We realised that action was needed to prepare teachers for this possible eventuality. As a result, I realised that I would have to re-orientate my research to focus on taking action to prepare teachers to transfer their teaching online. The chapter begins with setting the context prior to taking action and how school management and CARC worked together in the days prior to the announcement that schools would close. It outlines how we planned and implemented an intervention focused on training and demonstration of Teams to provide teachers with extra support and skills to enable them to transfer to online teaching. Following this intervention, results from feedback from staff led to the identification of a need for a further support intervention. Staff concerns about teaching online from their homes led to a request from CARC to provide a support mechanism for them over the two week schools shutdown. In responding to this, we organised a support intervention and implemented it, which helped teachers to address any technical or Teams issues they encountered during this time. The interaction with staff over this two week period led CARC members to consider a need to gather data on how staff were coping with online teaching. We were unsure of how many times schools could be closed down due to COVID-19 and it would therefore be important to become aware of issues staff were encountering during this this school closure so that we might address them prior to any further school shutdowns from the pandemic.

7.3 An Emergency Response to a Global Pandemic

The arrival of "a deadly disease called COVID-19 caused by a Corona Virus (SARS-CoV-2) referred to as a "'supernova' (Azorín 2020) creating 'undeniable chaos' (Hargreaves and Fullan 2020) and shaking the very fabric of education."(Harris and Jones 2020) COVID-19

challenged the education systems across the world and forced educators to shift to an online mode of teaching overnight. “Many academic institutions that were earlier reluctant to change their traditional pedagogical approach had no option but to shift entirely to online teaching and learning” (Dhawan 2020, 5).

By the 6th March the CBA OneNote Training Interventions had concluded, and I planned to continue data gathering for my research when the two subject departments conducted their CBAs at the end of the month. However, these plans changed dramatically when on the 12th March, six days later, the effects of the global pandemic forced all schools in Ireland to shut and transfer teaching and learning online. My research up until this time had focused on improving teachers’ use of ICT in their teaching, however this urgent need required an emergency response modification to my research question. The revised research question would be “how can I as a senior leader work with teachers to support and improve their use of ICT in the transfer and provision of online teaching?”

7.4 Setting the context to Phase 2 of my Action Research

We completed the third OneNote CBA intervention. In January 2020, concerns regarding China’s coronavirus outbreak began to emerge providing the world with the first glimpse of the spread of COVID-19. On February 28th, the first case of COVID-19 was reported in Ireland. By the 4th March, a total of six cases had been reported. By 9th March this figure was now at twenty four. It was quickly becoming a reality for Irish citizens that COVID-19 was becoming an imminent threat.

The following outlines the day by day unfolding of this crisis and how we planned to meet this new challenge.

7.5 Monday 9th March

On Monday 9th March, it was suggested by the principal that we hold a management team meeting, given the rising number of COVID-19 cases in Ireland and media reports of possible school closure. It was as Netolicky (2020) notes: “In a time of crisis, leaders must act swiftly and with foresight but also with careful consideration of options, consequences and side

effects of actions taken" (Netolicky 2020, 392). This is certainly true, but given the enormity and the uniqueness of this situation none of us were in a position to predict what might be the best solutions or the best actions. Harris and Jones (2020), state that as school leaders we were walking a tightrope without a safety without precedents or guides in leading schools in a pandemic. We knew we were fortunate to have rolled out our school digital platform Office 365, over a period of eighteen months.

At this meeting we were joined by one of my CARC colleagues given the role CARC had played in progressing ICT integration in school. We discussed our options and the CARC member provided insight from his experience of training staff in Office 365. On listening to his concerns, I proposed that we provide staff with a training/demonstration on the use of Teams in online teaching. The CARC could meet to create it and have it ready to implement should we be informed of an imminent school closure. The management team were in full support of this plan. I organised a meeting of CARC for later that day.

As the school leader, who had driven the narrative and action regarding the need to increase ICT use in teaching and learning in our school, I now found myself challenged with this emergency. However, with the help of my fellow CARC members, my collaborative action committee, I was confident that the progress staff had made in increasing their ICT competency would help us to address this challenge. This challenge or problem I believed could be addressed through my research. Given that the use of ICT would be central to addressing the challenge brought by school closure, I made changes to my research question "how can I as a senior leader work with teachers to support and improve their use of ICT in the transfer and provision of online teaching?

7.6 Addressing Teacher Needs to transfer to Online Teaching

CARC met to discuss and plan for the intervention that would support teachers in the event of a school shutdown. We discussed the Office 365 tools teachers had so far received professional development training in and identified Teams, as the tool which would enable teachers to communicate with their students online. We reflected on the training provided in the roll out of Teams, in the previous year, and as some time had passed since this training it

was important that we provide a professional development intervention to refresh teachers memory of how to use Teams especially to carry out online teaching. According to Matherson et al. (2017), "professional development occurs "implicitly in often unanticipated situations and in unrecognized ways" (p.29). Members of the committee in our discussion indicated that they were aware from discussion they held with their students that there were a number of teachers using Teams and how these teachers used Teams to post homework and share class resources. Students had indicated that they liked using Teams and found it very helpful in being able to access resources relating to their homework. This was positive for us as a committee as it provided evidence of the potential Teams provided in online teaching and in supporting student online learning.

7.7 Wednesday March 11th

On March 11th it was announced that "The World Health Organization (WHO) declared COVID-19 a Pandemic, pointing to the over 118,000 cases of the coronavirus illness in over 110 countries and territories around the world and the sustained risk of further global spread" (Ducharme 2020, 1).

7.8 Thursday March 12th – 11am

At 11am, March 12th, Taoiseach Leo Varadkar announced that all schools, colleges and other public facilities must close in the Republic of Ireland, from that evening at 6pm for at least two weeks in response to the spread of coronavirus. This announcement resulted in immediate action by the principal and I to hold a series of meetings to take urgent steps with staff to prepare for closure.

7.9 Thursday March 12th – 2pm - Planning and Setting the context for Staff Intervention

As a committee we were very cognisant that this training intervention was critical for the successful transition of teaching online for a large number of our teachers. We had agreed together that this intervention would first provide the step-by-step team training followed by a presentation from CARC members on aspects of how Teams can enhance online teaching. We agreed a plan for the intervention and in our planning of this intervention we were aware, from earlier CBA interventions and discussions with staff members, that a small number of

teachers had been using Teams and were familiar with it but there were a greater number of teachers who had not been using Teams and therefore especially needed this training. We were aware that there was considerable anxiety amongst members of the staff regarding their perceived struggles in teaching online as they had approached CARC members, following the shutdown announcement, during that day. CARC members had engaged with colleagues over the previous days, to ascertain if and how staff were engaging with Teams. Their findings from these discussions was that there were varying levels of use of Teams. A small number of teachers indicated that they had used Teams with their students on a day to day basis while a larger portion of staff indicated their issues included a lack of confidence, due to lack of use resulting in a loss in knowledge regarding the use of Teams. I believed, as did my CARC colleagues, that this intervention would help to reassure staff and help them to regain their knowledge of Teams and provide insight into the potential of Teams in engaging with their students online.

7.10 Intervention 1 – Phase 2 - Staff Teams Training Intervention COVID-19

This was the first intervention, a short but significant action we undertook two hours prior to school closure and the transfer of teaching and learning online. The CARC members under my leadership, delivered this training intervention. Staff actively engaged throughout the intervention by asking questions or offering their own suggestions regarding the use of Teams. There were considerable exchanges of knowledge on how to use different aspects of Teams. Even though we were a staff of over 60, it was clear that we were a community who were challenged with this new reality and teachers were keen to share knowledge to support each other in taking on online teaching.

7.11 Intervention 1- Findings

I gathered feedback from staff following the training to get their view on if and how this training intervention had prepared them for transferring to online teaching.

7.11.1 Teacher Anxiety

There was a real sense of anxiety and nervousness from staff. In observing them, I could see from faces that they were worried about what was now being asked of them. There was an atmosphere of dread not knowing what these next two weeks of school closure would bring in terms of the challenge to provide teaching online and how COVID-19 would affect them and their families. Three comments from teachers illustrate this apprehension

> *"To be honest, I am very nervous about having to teach students online. I can see from what the committee have shown us today that Teams is something I will need to practice over the coming days before we begin teaching next week".*
>
> *"I don't know about everyone else, but I am worried about how COVD-19 will affect my family and how I will manage to look after my family while also trying to teach using Teams online".*
>
> *"I am really feeling stressed and finding this all so hard to take in. I haven't used Teams before but know I will have to try my best to use it".*

7.11.2 Teacher Reassurance

There were a number of teachers who were positive about what they had learned from the intervention. The fact that various teachers had made suggestions on how to use aspects of Teams provided reassurance that Teams would be a good platform to engage with students and support their learning.

> *"I found that this demonstration has given me more confidence to use Teams. I have noted some of the suggestions for using Teams with students and intend to use these, hopefully, over the next two weeks".*
>
> *"I have used Teams over the last few months and have found it relatively straight forward to use. I think what you showed us today should help us all in adopting Teams, even if it only to use the basic aspects of Teams like posting homework".*
>
> *"I have not used Teams much up until now but I think this training demonstration has been helpful in refreshing my memory of how to use Teams".*

7.11.3 Request for Teacher Support

One of the concerns raised by the staff related to issues that may arise from their home either technical or related to Teams. One staff member asked

> *"Would it be possible for CARC members to provide some aspect of support?*

A number of other staff members were keen to voice their support for this suggestion. This was an issue we had not discussed as a committee and responded we would explore how we could provide this and communicate with staff as soon as we had a solution.

7.12 CARC Reflection

Following the intervention, we discussed our reflections and staff feedback findings. We were aware from this feedback some staff, still felt unsure about their transfer to online teaching. From observing teachers during the intervention there were facial expressions that suggested that what we were demonstrating was helpful and reassuring. Teachers were nodding their heads, which suggested to us that they were in agreement, acceptance, or acknowledgement of what was being demonstrated. This was positive and indicated that this intervention provided some level of support. In addition, the sharing of practice that teachers participated in throughout the intervention was also very positive as it not only showed that there were a number of teachers using Teams, but it demonstrated to the other staff members that Teams was accessible no matter what ICT competency staff had. The demonstration provided the novice Teams learner with the basic steps in using Teams while for the more advanced user the demonstration offered ideas of how Teams could be used in a more interactive way.

7.13 Planning for additional Intervention – CARC Support for Online Teaching

We examined how we could address the need outlined by staff for support during the two week school shutdown. One CARC colleague suggested that we could divide the staff group up so that each CARC member would provide online and phone support to one small group of teachers each. This we believed was a workable solution and agreed to communicate this

to staff that evening. This support would begin immediately and teachers were encouraged to ask for help when they needed it.

7.14 Intervention 2

Each member of CARC had a staff group that they had agreed to mentoring. Over the next two weeks, we provided ongoing phone and online support to our colleagues. We dealt with issues regarding Teams and technical issues staff experienced in getting their computer ready for online teaching. A positive outcome from our support was the regular communication, each of us had with our group, which led to the building of a support relationship to alleviation of the sense of isolation teachers were experiencing at this time.

7.15 Observation and Reflection Intervention 2

Over the course of these two weeks, the CARC members in holding support conversations, were learning glimpses of how staff were adjusting to online teaching. In an online Teams meeting we held, I suggested that we consider gathering a more detailed account of staff experience of online teaching, given the uniqueness of this experience. The aim of this research was to work with teachers to improve their use of ICT in online teaching and by conducting a staff survey towards the end of the two week shutdown, we would be able to learn more about their progress in adopting and adapting practices through ICT. In addition this survey would look to identify what issues arose for teachers in teaching online which would enable us to consider how we might address these issues in future interventions. The CARC members were in agreement with this suggestion and we agreed to plan to undertake this survey, towards the end of the two week closure. This would be the third intervention of this phase of my research.

7.16 Conclusion

This chapter provides an overview of how our school met the challenge of preparing teachers, almost overnight, to transfer to online teaching as a result of school closure due to COVID-19. It details, how we set out to put plans in place and how when the announcement came that schools were to close from 6pm on March 12th 2020, the CARC were ready with our

action plan. This plan was to implement an emergency staff training demonstration, intervention 1 of this phase of my research, in Teams from Office 365. Staff would be required to adopt Teams, to provide ongoing support to their students through online teaching. Following the intervention, findings highlighted the anxiety and worry staff felt at this sudden school closure and their need to adopt Teams to teach online. A request from staff for CARC members to provide support during this school shutdown was voiced. We, the CARC members, met following the intervention and put a plan in place for a further support intervention to help teachers through the difficult challenges of online teaching, from their homes, they now faced.

Chapter 8: CHAPTER 8 - COVID-19 POST CLOSURE STAFF SURVEY OF ONLINE TEACHING

8.1 Brief outline of this Chapter 8

The following chapter sets out how we, the CARC members, planned and undertook a Staff Survey, which we referred to as the COVID-19 Post Closure Staff Survey of Online Teaching (Appendix E). Following analysis of the results of this survey, it details the findings and our reflection on these findings and how this led to a need to undertake a further intervention.

8.2 Introduction

For schools "transitioning to online in such a short period of time was really tricky… one day we were in school, and the next day, the whole world was kind of flipped upside down" (Manca and Meluzzi 2020). During the first two-week period CARC provided online support to teachers through a planned support intervention. The sudden nature of the transfer of teaching online was a shock to many teachers. We could see from their initial need for support that they found themselves in unchartered waters and needed help to adjust to the shock of the suddenness of the shutdown. The sudden shift from classroom-based to online learning had a significant effect on the uses of educational technology in schooling (Patel et al., 2020), requiring swift adaptation by teachers and pupils to the features of the digital platforms thrust upon them (Education Endowment Foundation, 2020; Global Education Monitoring Report, 2020) (Bubb and Jones 2020). Despite this shock we, the members of CARC, quite quickly saw that teachers were adapting to their new environment. In fact by the end of the initial two week period of shutdown, it became apparent that many staff had in fact adopted Teams and were keen to learn more about how they could improve their knowledge around their provision of online teaching.

As outlined in Chapter 7, CARC established a need to undertake a staff survey, following small insights into staff experience of online teaching. We could see the need to identify issues that existed in online teaching in order to take action prior to any further school shutdown resulting from the pandemic. We had made this decision just prior to the announcement by the government of a further two week lockdown.

I emailed staff a link to the survey, inviting them to complete on an anonymous voluntary basis (see Appendix E). I explained that the aim of this survey was to gather data relating to teacher experience of online teaching. It was also to identify any issues they had encountered. I was eager for staff to know that I and my CARC colleagues would do our best to address issues raised and provide support during the now extended school closure.

8.3 Survey Response Rate

A total of twenty-seven questions were included in this survey. This survey can be located in the Appendix of this thesis (see Appendices E). For the purpose of this research I will focus on the following five questions. The reason for this is that they provide a rich insight into how teachers had used ICT to provide online teaching and support, teacher focus on skill needs and skill progress, the positive outcomes and the challenges experienced by teachers as a result of online teaching. Data analysis of these five questions provided a number of issues that we could address in future interventions.

The questions were as follows;

1. How are staff providing online support to their students?
2. What ICT skills staff now had and what further support they required?
3. What progress have teachers made in the development of their ICT skills?
    a. ICT skills pre closure
    b. ICT skills post closure
4. Teacher's experience of online teaching - Positive Outcomes
5. Teacher's experience of online teaching – Challenges

Findings:

1. How are staff providing online support to their students?

There was a very high use and adoption of Teams by staff, clearly indicating the progress made in staff ICT competency from the initiation of this research. 100% of staff surveyed indicated that they had set work online and communicated with their students via Teams. 95.24% of staff were uploading assignments with a specified submission time period. 81% of staff were receiving and returning student assignments. Further comments revealed and an

indication of how far we had come. *"Teams is brilliant. The assignment function – which I have now mastered – is particularly good."* Given ICT adoption rates twelve months ago, this progress in ICT competency and adoption was quite remarkable. Teachers were keen to emphasise and praise that our ability to transfer to online learning was due to the actions of CARC under my leadership. Without this research and the efforts taken over the two year period, we as a staff would not have been in this positive position. In setting out to address the research question raised as a result of the student evaluation survey in 2018, we had helped staff to move from an extremely low position of ICT competency and adoption in their teaching to this very positive position we now found ourselves in. As one teacher put it

> *"Little did we think that this fantastic facility would become the primary vehicle for teaching/learning. Great credit due to management and the ICT committee for implementing it and staff in general for adopting it".*

> *"If we put all things into perspective the fact that we can maintain contact and progress learning is a huge positive. Our school is in a very fortunate position and we should not lose sight of that".*

Despite this positivity there were issues raised regarding the ability of staff to support students online. 19% of teachers indicated that they had not fully engaged with students online. In particular these teachers indicated that they had been unable to correct student work instead they provided students with a study plan for the two week duration. The reasons for this minimal engagement did not necessarily relate to staff ICT competency instead staff comments indicated that teachers own personal circumstances had prohibited their full engagement which included issues relating to all family members competing for and sharing resources and family space during this period. In addition teachers living in rural areas or areas that experienced poor broadband were limited in their provision of student support.

> *"It can be extremely difficult to work from home when the whole family is in the house. It is not the way working from home would normally function. If both parents are working nobody is watching the children and we cannot send them to crèche/childminder etc".*

> *"Getting the physical and mental space to get work done with a full house to look after".*

"The quality and overall effectiveness of online learning is very much dependent on internet speed. Living in areas with poor broadband can be frustrating and makes uploading video tutorials difficult".

2. What ICT skills staff now had and what further support they required?

It emerged that staff had mastered the basics of using Teams over this two week period. They were now keen to get further training marking and returning student work, the additional aspect of Teams that teachers had not received training in. It was clear that some teachers had figured out these tools while others had sought help, as outlined in the previous section, from the CARC during the two week period to advance their Teams skills. A further sign that staff ICT competency was growing was the 52% who indicated that they required training in using APPs to enhance their provision of online teaching. A larger percentage of 70% expressed their interest in learning more about how to provide online LIVE video streaming to deliver their online teaching. A response from one teacher highlights the interest in progressing their skills.

"I am currently communicating with 3-4 other teachers in my subject around the country to find the best/easiest software to use to stream live classes, record large video clips using mobile/laptop/ visualiser /iPad etc to enhance student learning".

The data here supports the previous findings regarding the advances in teacher's ICT competency. It highlights that teachers had not only advanced their skills in the use of Office 365, but also in a range of additional ICT tools enabling them to provide and stream classes live. As results from these two questions had generated a comprehensive view of the progress staff had made in their abilities to progress teaching online however the next question provided a data set that confirmed earlier findings.

A. "Prior to the closure of the school due to COVID19 how would you have rated your ability to undertake online teaching?"

B. "Since closure of school due to COVID 19 how would you now rate your ability to undertake online teaching?"

8.4 Analysis

The contrasting responses from these two questions show the remarkable shift in teacher efficacy rates prior and post school shutdown. Prior to school closure 36% of staff rated their

ability as little or no ability. This equates to over one third of staff surveyed, a significant proportion of staff, who when the school shut, claim to have had very low levels of self-efficacy in their ICT ability. The rate prior to closure is alarming but not unusual in technology diffusion and adoption. 64% of teachers indicated that their ability ranged from fair to excellent. Everett Roger's presented his theory of diffusion of innovations and in this outlined the general rates at which technology is diffused which equate to our findings (Rogers 2010). Rogers found that 2.5% of the population are first to take up the innovation and referred to as innovators. Next are the early adopters at 13.5% followed by early majority at 34% bringing the percentage of diffusion to 50%. The next group are the late majority representing 34% followed by the laggards at 16%. According to these metrics we were at a stage of late majority adoption (between 50% - 84%). Teachers in this category are individuals who adopt an innovation after the average member of society or in this case our teaching staff. These individuals approach an innovation with a high degree of scepticism.

It was interesting and encouraging to find that engagement levels with staff and ICT had risen significantly following the work the CARC members under my leadership had undertaken to improve teacher use of ICT in teaching prior to the COVID -19 school shutdown. 64% of staff had rated their ability as fair to very good. This showed critically that the work we had undertaken with teachers and in progressing with this study had led to greater ICT ability and self-efficacy amongst staff. Recent research in ICT in teaching demonstrates "a positive relationship between self-efficacy about using digital tools and the use of ICT for teaching purposes" (Teo 2014, 558; Hatlevik 2017). The improving belief staff had regarding their improved ICT competence was important and should result in their increased use of ICT in classroom teaching. There was a marked contrast to the data gathered from the second part of this question where this percentage increased to 98%.The major leap indicates the impact this sudden and intense transfer of teaching online had on teachers.

> *"The sudden shift from classroom-based to online learning had a significant effect on the uses of educational technology in schooling (Patel et al., 2020), requiring swift adaptation by teachers and pupils to the features of the digital platforms thrust upon them (Education Endowment Foundation, 2020; Global Education Monitoring Report, 2020)' (Bubb and Jones 2020, 210).*

"The COVID-19 situation requires not only knowledge and skills but also confidence regarding success in online teaching" (König, Jäger-Biela, and Glutsch 2020, 611). The

results from this staff survey were far higher than results from a similar research survey conducted by Sarah Bubb in collaboration with Mari-Ana Jones, who in September 2019 had begun research in Norway into why students had negative experiences of learning and in an effort to address this had implemented strategies to promote project based learning. As with my research, the transfer of teaching online impacted on her research and in response in June they rapidly conducted research that gathered opinions from pupils, parents/carers and teachers on "Learning from the COVID-19 home-schooling experience: Listening to pupils, parents/carers and teachers." they found that "two-fifths (40%) of teachers and pupils agreed that they had become better at using digital tools during the home-school period" (Bubb and Jones 2020) Our result of 98% is in marked contrast to this. Why did we see such a marked difference? When asked has the school closure prompted your readiness to learn more about ICT in your teaching? 87.5% of teachers responded that it had. In addition when asked has the need to try and support online learning provided motivation for you to increase your knowledge of ICT to support learning? 88.1% of teachers responded it had. These results provide a convincing picture of staff commitment, motivation and interest to improve their use of ICT in teaching during this initial two week period. They show the progress made in achieving what we had set out to do through this study to work with teachers to improve their use of ICT in teaching and provide evidence of why a result of 98% improvement was achieved during this time.

8.5 Teacher's experience of online teaching - Positive Outcomes

A large data set was obtained from the question relating to teacher's positive experience of online teaching. The first key theme that arose was that teachers experienced a better insight into their students' ability and potential through online teaching. It provided teachers with an opportunity to get to know their students in a different context, "*getting to see students' work up close regularly so I can get an even better idea of how they are doing with a subject and/or task".* Online learning provided our students with an opportunity to take time and put more effort into assignments which teachers recognised from their increased grades. "*Allowing students work within a time frame, at their own pace, some are producing the best work I have seen from them".* Online teaching provided opportunities for teachers that would have been difficult to do in their classroom teaching. It provided teachers with the

opportunity to give more detailed feedback than they normally would have time to do in the classroom.

> *"Those students who engage and complete assignments on a regular basis have a much fuller feedback, formative and summative, from me than would be possible in a normal class setting; this helps to allay some understandable anxiety at this difficult time."*

Providing this degree of formative assessment was extremely positive and had the potential to increase student motivation in upcoming assignments. The positivity shown by teachers in their remarks regarding their willingness to do whatever they could to support students through their online teaching is mirrored by research carried out by Gudmundsdottir and Hathaway (Gudmundsdottir and Hathaway 2020, 244). Their research was carried out to investigate teachers' readiness for online practice as a result of COVID-19 found that teachers displayed a positive approach to their transfer of teaching online and were 'willing to go the extra mile'" to help their students during the COVID-19 shutdown. It is important to note that despite the large percentage of teachers who did identify assessment and feedback in their positive outcomes, over a third of teachers (35%) did not. We know from previous findings that a number of teachers were unable for reasons given to properly engage in the assessment of student work. This result was a reflection of these teachers who because they did not advance their online teaching to assessment were not in a position to identify assessment as a positive outcome.

According to 54.8% of teachers, student's work had improved through online teaching. They highlighted that these improvements were clear in terms of the quality of submissions which indicated that students were spending more time and putting more effort into online assignments. Findings in my research suggest that for certain types of learners, online learning was very positive. One teacher commented "some very motivated students sending in great work and really engaging". Teachers indicated that these students took more ownership of their own learning experience leading to the creation of their own learning space which resulted in an increase in effort and a higher standard of work submitted. *"Students that are engaging with the process are getting a lot out of being able to work at their own pace from home".* "*Students self-directed learning in certain aspects has been very good. Students are very capable in terms of submitting work without much direction*". By removing the distractions and providing students with a more independent approach produced

some major surprises for teachers in terms of the standard of work being submitted and from the students whose work was being submitted. Teachers commented that *"I have seen some incredible work from students who do not do well in a classroom setting but are excelling online. It's so brilliant to see and I am commending them daily on all their efforts".* One Leaving Cert teacher commented *"some of the 6th year boys who would have been distracted in class are actually making an effort because of not being distracted by others. I find most of the students are really making an effort."* It is important to reflect in terms of my research on these outcomes. It is as a result of the study I undertook with the help of my fellow CARC members, that we were in a position to deliver online teaching to support student learning. These findings provide a positive insight experienced by teachers of their experiences of student online learning. The ability of teachers to have achieved an ICT competency to enable them to identify such outcomes is directly related to the initiative I and my fellow CARC members undertook, with staff, to address the research question for this study, "how can I, as a senior leader, work with teachers to improve their use of ICT in teaching (and due to COVID-19, online teaching).

Having examined the positive outcomes for teachers relating to their engagement of online teaching, I wanted to learn about the challenges they encountered from online teaching.

<u>What challenges have you encountered since engaging in online teaching?</u>

Despite the positivity indicated by teachers in the previous question regarding student engagement and assignments, it is clear that some teachers had encountered challenges in their experience of online teaching. There was a level of frustration regarding the level of student non-engagement and non-submission of homework or assignments in some class groups. Issues arose with a number of students who failed to engage online, on any level.

> *"There are obviously a number that don't appear to be engaging. However, that's not to say that they are definitely not, but they are not submitting work or reacting to posts. I'm hoping that some of these are at least going over the lessons as it is ALL vital new material."*

In particular language teachers were struggling to provide a comprehensive delivery of certain aspects of their curriculum.

> *"Teaching a language in the classroom involves a lot of encouraging and explanation of vocabulary and grammar but with online learning support this is missing and therefore I have to give enough written information to the students so that they can understand the new material."*

Another language teacher commented

> *"No, little, or inconsistent engagement from students. For languages, accessing listening comprehensions can be difficult for students - accessing eBooks etc. requires a lot of explanation that a number of students may find too difficult to do on their own."*

A strategy used by teachers to determine who was engaging and who was not was a request to students to simply click on "thumbs up" icon on Teams to confirm they were online and engaging. Even though this is a very simple strategy, it does however again illustrate the ICT competency teachers had achieved and their self-efficacy through the efforts of CARC under my leadership in this research. They produced, a simple, but effective ICT strategy to deal with student engagement. Teachers indicated that a number of their students failed to respond in this way. Teachers worried that without this indication, many of their students who failed to engage, would stall in their academic progress. Teachers did acknowledge that many students were unable to engage for a variety of reasons at home but, in particular their lack of access to technology.

> *"Not being able to reach every student due to circumstances at home etc. It can give an unfair advantage to students who have access to technology in the home. Those students who do not have access or it is limited are now missing out".*

The issue of students not having access to technology was discussed by CARC and a suggestion was made to offer, on loan, to students, school hardware in the form of Tablets for the duration of the school shutdown. This would help address some of the issues relating to student engagement. The student population were informed of this initiative via a text and a small number of students availed of the offer.

Over the course of the initial two-week shutdown, following requests from teachers to CARC regarding how they could go about making the process of setting, correcting and returning assignments, members of CARC had directed teachers towards the "assignment" feature in Teams. They provided guidance on its use over the phone to a number of teachers and these teachers shared their new knowledge with colleagues. The strategy, we had agreed following

school shutdown, to mentor teachers, one group each, enabled the transfer and diffusion of this new knowledge throughout each teacher group. This is an illustration of how the value the support provided by CARC to teachers, through this research, led to improved ICT competency and diversity of use in supporting student learning. The assignment feature helped to streamline the setting and submitting of assignments for teachers and students. Prior to this teachers had begun to experience frustration in the whole assignment process.

> *"Prior to being instructed in the "assignments" feature in Teams, I found setting homework disheartening, the lack of feedback/ work submitted by exam years. Particularly 3rd years. I've found the assignment function very useful to keep track of who is viewing the assignment (gives time/date etc..) and the students who are submitting the work".*

For the students who were genuinely not engaging there were further issues with non-submission of homework or assignments. Teachers, indicated that they believed that online teaching was more suited to certain subjects and this could impact on engagement. There was no doubt but that teachers felt frustrated with their inability to address student lack of engagement beyond a phone call home. The issue of engagement or lack of engagement raised a new issue for this research. We had no idea how long schools would be closed due to the Pandemic and if opening was delayed by an extended period of time this would have serious implications for student learning and achievement. I therefore suggested to my CARC colleagues that in order to address this we should carry out a student survey to identify issues relating to engagement and to learn about student experience of online teaching and the impact of it for their learning. My fellow CARC members were in agreement with this further intervention.

Time was identified as an issue for teachers in their online teaching. *"Time is my biggest enemy - or lack thereof".* Working online required teachers to spend increased amounts of time in preparing to deliver online teaching. Teaching online was more onerous than classroom teaching, *"getting the time to prepare, and correct. Working more hours now than if we were in school!!!* Many teachers were sharing their workspace at home with other family members. Some were young parents who, not only had to share workspace, but their computer with family members and take care of their children. Finding time to teach classes, correct assignments, prepare for the next day while sharing home space and responsibilities resulted in teachers finding themselves extremely pressurised for time leading to surmounting stress. *"Getting the physical and mental space to get work done with a full house to look*

after". For teachers, online learning was leading to a greater amount of corrections. Teachers remarked that in order to keep students focused on learning and making progress, they needed to set greater amounts of homework creating a higher volume of corrections. *"The submitted assignments are sometimes difficult to correct and giving feedback and corrections takes a lot of time".* This proved stressful and a challenge to maintain. *"Correcting work is very difficult at times depending on how it has been submitted. It is also very time consuming".* The sudden transfer of teaching online produced a whole set of new issues for teachers regarding the setting and correcting of homework. Because teachers were thrown into the deep end with regard to the pedagogical approaches they should take, it was inevitable that stresses and strains would arise. Despite teachers being trained in how to use the same digital framework of Office 365 and specifically Teams, they had received technical training on Teams and apart from the last day staff Intervention they had not had specific training in how to apply it pedagogically. Phase 1 of my research had focused on the delivery of ICT professional development training which combined the technical with pedagogical application of OneNote. It was my intention to roll this out to other departments providing teachers with an opportunity to experience the combined learning of how to apply ICT technically and pedagogically. COVID-19 put a pause on this roll out.

Given the rural urban divide various issues arose regarding Internet access and Broadband speed for teachers. *"Poor Broadband connection at certain periods of the day".* Without sufficient internet capacity teachers were unable to deliver online teaching. *"Without broadband it's slow going for me".* This was challenging and frustrating for teachers, students and parents. It was acknowledged that this was an issue for teachers and students. *"My own WiFi signal is weak. I'd like to do 'Zoom' etc. but it's unfeasible at the moment."*

Teachers commented on their experience in finding that many students had limited ICT skills. *"The other challenge is the lack of basic ICT knowledge that students have especially in the older years".* Despite students being highly skilled in the use of mobile phone technology they have not developed ICT skills to the same level. *"Students are not as skilled as we tend to believe. "Some have struggled (and continue to struggle) to take pictures and upload them to Teams/Assignments of work set".* Teachers did acknowledge that for many students it was not necessarily lack of ICT skills that was impacting on their engagement rather issues relating to access to technology from home. *"Some students not engaging; students not having access to home computers/laptops".*

8.6 Reflection and Analysis

Survey results provided substantial evidence that teachers had made remarkable progress in increasing their use of ICT in teaching and learning in this very short period of time. Results pointed to a marked improvement in teacher's ICT competency before and after the shutdown. The considerable shift revealed by this data signalled that the COVID-19 emergency had necessitated the transfer of teaching and learning online and this new reality had compelled teachers to rapidly upskill in ICT and in particular the use of Teams. This transfer of teaching and learning online would not have happened without the actions taken through this research. The early identification of the fundamental problem that initiated this research, that of the lack of use of ICT by teachers in teaching, was the catalyst for a process and actions that enabled the school community to quickly change to online education. The establishment of a new ICT platform, Office 365 and the subsequent roll out of Teams meant that the school was in a fortunate position to be able to react to the challenges the pandemic delivered in the matter of a few short days.

Survey data provided unique insights into how teachers overcame issues and increased self-efficacy during this time. However important this increase in ICT skills was, what emerged was the need to provide teachers with ICT professional development that combined technical and pedagogical knowledge to effectively integrate ICT into their teaching and learning. Teacher responses highlighted the need for ICT pedagogical strategies to address the stress that arose as teachers tried to accommodate students with various learning needs and digital needs. The decision to undertake this research eighteen months earlier, I believe, was vital to the reasonably smooth transfer of teaching and learning online. When teachers were forced to teach online, they had, at the very least, a basic Office 365 knowledge. This skill set provided a basic grounding in the tools of Office 365 that enabled them, over the initial shut down period, to rapidly increase their ICT competences and self-efficacy to the extent that teachers became highly proficient in delivering their teaching online.

8.7 Possible Future Interventions Required

There is further scope for additional ICT professional development adopting the collaborative apprenticeship framework to deliver on the job focused training to teachers. Addressing issues such as poor student engagement in online learning, developing pedagogical strategies to support teachers in providing online teaching and learning would be important future interventions. The lack of student engagement provides a major challenge in continued school shutdown. Continued student disengagement will result in considerable student academic weakness.

8.8 Reflections

When refining my research question during reconnaissance, "how can I as a school leader work with teachers to improve their use of ICT in teaching?" I had no idea of the potential transformation that lay ahead in terms of teacher adoption of ICT in teaching and learning. The major efforts the CARC and I had put into rolling out Office 365 and in working collaboratively with staff through the phases of this research had resulted in a significant increase in staff ICT skill levels. It had led to teacher's ability to independently, despite varying ICT competencies, to undertake online teaching and learning. It is important to acknowledge that despite the successes achieved by teachers in their progress of ICT adoption there was a very human story to the journey teachers had to take and the sacrifices they had to make to achieve this progress. For almost two thirds of teachers who completed this survey, it was evident that the rapid nature of their transfer to online teaching from their homes was taking a major toll on them personally. Signalling that they were not coping well with working from home, teachers drew attention to the challenges of being a teacher parent which created increased levels of stress as they tried to multitask, from home schooling their own children to providing the best possible teaching support to their students.

Reflecting on this data and through its analysis it was clear that teachers had provided reflections not only on their personal experience but, on their experience of teaching their students online. This led me to consider that a number of future interventions may be required to address issues that arose from teacher experience of online learning. One such intervention that had been identified through the survey data was the need for CARC to

provide professional development in applications such as “Zoom” so that teachers could hold “live” online classes with their students should there be a need for more online teaching in the coming months. Another need identified was the requirement for more pedagogical approaches to online teaching given teachers were challenged with how to approach their mixed ability classes online.

The identification of the need to conduct a student survey arose from analysis of data from the teacher survey. I remind you the reader that this further intervention is quite significant as the catalyst behind this research study stemmed from a student survey carried out by me in 2018 with Leaving Cert students. It was through this survey that I had identified the issue that led to this research. Three years later it is appropriate that I once again look to our students this time to examine issues, highlighted in the staff survey, that they encountered that led to problems with their engagement online. It is also an opportunity to learn about their experiences of online education. In doing so the members of CARC can consider the issues identified and consider possible actions that may lead to increased engagement in any future school closures.

Chapter 9: CHAPTER 9 – POST CLOSURE COVID-19 STUDENT SURVEY

9.1 Brief outline of this Chapter 9

This chapter outline the process we undertook in implementing our fourth intervention of Phase 2 of this research. One main reason for undertaking this survey was to examine the issue raised from the teacher survey (Chapter 8) regarding the lack of student engagement in online teaching. I have focused on three key questions, which provide insights into what factors encouraged or discouraged students from engaging online with teaching and learning. Finally, the CARC and I reflect on how the findings from both surveys, teacher and student, inform issues raised from each other's survey.

9.2 Brief outline

In planning the student survey, I suggested that we plan this survey comparably to the teacher survey, as this would enable us to identify and contrast the experiences, particularly relating to engagement, of students with that of their teachers. The need for this survey arose from the substantial issue raised in the teacher survey regarding the lack of student engagement online. It was important to discover what issues students encountered regarding their online engagement and see what we, the CARC members, could do to address this problem. The issue of poor student engagement online is important to address given its impact negatively on teacher's opinion of online teaching. Furthermore, if students are not prepared or able to avail of online teaching, this will have serious consequences for their attainment over time.

9.3 Student Survey Analysis

The Student survey consisted of ten questions (see Appendix F). The data gathered provided an insight from the student/learners perspective of online education. For the purpose this discussion, I focused on responses to three questions that provided data relating to the issue of lack of engagement and provided some context as to why some students found it difficult to engage with online teaching. A total of 116 students of a student population of 650 completed this survey.

The three questions I focused on were

1. Student rating on their experience of online teaching and learning?
2. What students felt were the best aspects of online teaching and learning?
3. What students felt were the worst aspects of online teaching and learning?

9.4 Findings

1. Student rating on their experience of online teaching and learning?

Analysis of these results indicate that 30 students out of 116 (26%) rated their experience of online teaching and learning as good to very good, 52 (45%) students rated their experience as "alright" suggesting that this first month of online teaching and learning was just about tolerable. 34 (29%) of students rated their experience as ranging from poor to very poor. This data is concerning as it indicates that only 1 in 4 students rated their experience clearly positive. Responses to this question give a varied insight into why these students had a poor experience. One student responded; "*Online learning is really boring; I prefer being in school. I can't finish my work easily and I can't concentrate on my studies because of my phone".* A further response identified poor internet access as a problem regarding engagement; "*My Internet at home is very bad and often I can't open or send assignments".* This issue was echoed by a number of students. As another student outlined "*I have terrible internet access and it takes forever for me to upload anything or for my work to load with many assignments showing up late for me and me being unable to complete them on time".* A number of students referred to the responsibilities they had at home which reduced the amount of time for online education and the added issue of homework overload impacted on engagement.

> *"I participate to the best of my ability but with the amount of work we are getting I am unable to complete everything on time as I also have plenty of responsibilities at home that need to come first especially with the situation that has arisen around the world right now".*

The issue of too many assignments arose in a number of responses such as

> *"I think we are getting way too much work to complete in too short amount of time. Many times, I had to stay up for most of the night and get no sleep to try and get them completed on time. "*

A theme echoed by another student who found that work overload impacted their motivation; *"Struggle to have the motivation/the work can be hard to understand/teachers seem to not work together on the amount of work to give to students resulting in a lot of work due for the same time".* The transition to online teaching required students to develop skills in independent learning. Some students struggled with this as one commented *"It is difficult to teach yourself".*

The transition from classroom learning to online learning was a major change for students. They no longer had the supports of the school day such as friends and face-to-face interaction with teachers. As the majority of teachers were communicating through the chat function in Teams, students had little or no spoken interaction with their teachers requiring them to become more independent in their learning and for many students this would have been a particular challenge. Students have been educated from early childhood with a model of education that puts the role of the teacher at the centre of knowledge delivery. For many students their learning is directly impacted by interactions with teachers. COVID-19 disrupted this approach to learning and learning became more learner centred. For us, the members of CARC, these findings provide some answers to why teachers encountered experiences of poor student engagement. A number of issues raised by students can be examined and interventions created to try and find a solution to them. Educating parents on the need to reduce student access to mobile phones during online education is one such intervention. The overload of assignments is another issue that CARC can address collaboratively with teachers so that more time and less assignments can improve student engagement.

9.4.4 <u>What students felt were the best aspects of online teaching and learning?</u>

The next question gathered data on student positive experiences of online education. Analysis of the data from this question produced seven categories of responses. For the purpose of this report I will focus on the top three aspects identified by students. The first of these categories identified related to independent learning. 37.4% of students identified the positive opportunity online teaching provided to learn independently. This was supported by other research that was carried out during this time. "Research for the OECD found that 'an increase in the autonomy of pupils to manage their own learning' was an unexpected benefit

of home-school (Reimers & Schleicher, 2020, p. 18)" (Bubb and Jones 2020, 210) Students identified that they like being able to work at their own rate, *"taking notes is easier because you can do it at your own pace."*. They identified the flexibility this type of learning offered. *"I can go about my day in a more flexible way" a*nd how this flexibility enabled them to concentrate better. *"Flexible working hours lead for better concentration on my work".* The enjoyment of learning away from the school classroom. *"It has been easy to learn new things without spending most of the day in school".* Online learning offered students a chance to plan when to complete assignments and upload them providing them with a much more efficient approach to learning. *"I like the fact that I can get work done prematurely and send it in quicker to free uptime elsewhere which couldn't always be done in school".* Students felt they had more time to study by working from home. *"I'm finding studying a lot easier because I have more time."*

The second category in what students identified as the best aspect of online teaching and learning was the smooth continuation of teaching and support from their teachers. This is an outcome that without this research would not have been achievable. The work we had undertaken with teachers in the eighteen-month period prior to school closure in progressing teachers use of ICT in teaching, through the adoption of Office 365 and in particular Teams, had made this smooth transfer possible. Just over one quarter of students (25.3%) highlighted the ability Office 365 tools, such as Teams, provided in enabling teachers and students to continue to communicate and carry on teaching and learning online. The ability of Teams to allow for the easy and prompt transfer of assignments between students and teachers was really helpful to students. *"Keeping up with the work and having the teachers send them it to you so you don't fall behind".* As teachers had indicated clearly organising class material and additional student resources is extremely important for the effective delivery of online teaching. TEAMs enabled teachers to upload these materials so that students could easily access them. This student found this a great help. *"I really like how teachers lay out clear instructions and a run down for the week, uploading resources (i.e. PowerPoint, assignment guidelines, etc.) to help us in our learning". A* small number of teachers used "Zoom" to provide LIVE classes to their students. By continuing to progress course work through Zoom, teachers were able to help reduce student stress levels and worry. *"Doing maths with Ms X through Zoom helps me structure my day and I'm not stressed about finishing the course anymore".* This illustrates the substantial progress a number of teachers had made in their ICT competency, especially when I consider where we started with this

study. The clear lack of ICT competency and self-efficacy teachers experienced at this time in relation to the use of ICT in their teaching now had been transformed to teachers providing online LIVE classes with their students to further support their learning during this time.

TEAMs provided students with an effective way to stay in contact with their teachers. *"Availability of teachers through Teams I guess".* Teams allowed students and teachers to communicate with each other in a very direct and time efficient way. *"Teachers are there for us students most times and easy to reach out to when needing help".* Students found that teachers were almost always willing to provide support throughout the school day. *"Teachers are almost always available".* Online teaching and learning supported by Office 365 provided the framework to enable teachers to cover new subject matter with students. This was important as teachers still had courses to cover and students needed to continue their learning in preparation for end of year exams. *"The fact that even though we aren't in school we are still getting stuff done".* Students were keenly aware of the importance of their relationships with teachers and eagerly acknowledged that teachers were extremely supportive of their learning doing everything they could to ensure students did not lose out in their studies. "*I know the teachers are doing as much as they can with multiple classes. For me online learning is going good so far".* This finding is echoed by similar research during this time "the technology was a vital foundation stone, but our research suggests that teachers raised their game during the home-schooling period" (Bubb and Jones 2020, 218).

The third category related to the flexibility and efficiency offered by technology to student learning. 15.2% of students highlighted technology efficiency as being the most positive outcome for them of online teaching and learning. The ease of access to assignments *"How easy it is to access the work".* Being able to store student work in one place was very positive. *"I would say knowing that I have all my work saved on to laptop and not having to look for it in different copies".* The transfer of teaching and learning online provided students with the opportunity to work digitally, which many seemed to really enjoy. *"The best aspect of online teaching for me would be the use of a computer".* The use of technology has created a learning space that some students found easier to navigate. *"The integration of technology has made doing and submitting homework much easier".* Teachers share resources digitally and these further supports student learning. *"Detailed Power Points are really good and makes note taking easier".*

So far, this chapter has cast light into students' positive experiences of engaging with technology and how this engagement brought a range of benefits to student learning. The ease of access, the ability to store notes, homework electronically rather than having to work with numerous copy books was identified as a key advantage of student use of ICT. The provision of Zoom classes (online teaching classes) was frequently mentioned by students as something they enjoyed and benefited from. However, students also reported of negative effects of online learning. In what follows, their negative experiences will be discussed.

9.4.5 What students felt were the worst aspects of online teaching and learning?

The third category of responses were produced from responses to the question asked of students to outline their worst aspects of online education. Analysis of the data from this question produced five categories of responses. For the purpose of this report I will focus on the top three aspects identified by students in this question (see Appendix F). It is interesting to note that similarities exist between categories here and in the previous question even though they are on an opposite spectrum to each other, it is evidence of the mixed experiences of students regarding online education.

44.4%, almost half the student respondents identified "assignment issues" as the worst aspect of online teaching and learning. Student experience suggests the overload of assignments with vague instructions completely overwhelmed them. *"Some teachers giving large chunks of difficult material within a short time frame with vague instructions, it is overwhelming and often doesn't get completed by the majority of students*". Is this a possible reason why teachers experienced engagement issues with their students? Was the saturation of assignments a reason why students lacked engagement online? From these responses it would seem that the overload in student work had negative consequences for student engagement. *"Teachers giving us too much work on the days we don't have them".* It is evident that students believed that teachers were too ambitious with their student learning targets. *"Too much work because of big study plans".* This was very stressful for students. *"The stress all the time due to the mountain of assignments ahead of me".* Too little time and too much to do. *"Overlap and little time to complete assignments".* Analysis of this data clearly indicates that for many students the build-up of assignments overwhelmed them leading to stress and the inability to complete assignments on time, issues that would have impacted their

engagement. For my research there is a clear need to address these issues raised by students and identify interventions that help to resolve these issues and support student engagement.

The second issue raised by 20.4% of students was the "difficulty studying and learning online". In their response's students referred to different issues which determined their selection. The transfer of student learning to online learning required the transfer of location of learning from school to home. For many students, as it had been for teachers, this was a difficult transition, given not all homes have the same environment or support mechanisms. *"Not being in a classroom environment and staying focused at home was hard for me".* The added distractions of being at home and home life impacted student learning. *"Being distracted in my own home by the tv, my phone or family".* The difficulty some students experienced with independent learning are highlighted. Issues such as trying to keep up with learning and assignments were raised again. *"I'm not getting learning done, I find it hard to keep up with all the assignments".* Learning new aspects of the curriculum without the direct help of teachers was a struggle. *"I find it hard learning new topics alone".* The difference in terms of communication between students and teachers with regard to online learning and classroom learning was identified. In the regular classroom environment students have full face-to-face access to their teacher enabling them to ask questions to help support their learning however, with online learning the nature of this communication was changed, and students were limited to messaging their teacher for support. Some students experienced difficulty in learning to adapt to this form of communication identifying this as the worst part of online education, *"learning how to communicate with my teachers online."* It added to student stress levels as they were worried about imposing on their teachers by using the chat function to seek clarification. *"Difficult sometimes because it would be better to ask the teacher the questions in class instead of annoying them with loads off messages online".* Student responses raised a number of issues regarding their frustrations and difficulties in learning online. Students missed classroom interaction which they felt provided them with a better learning environment. They felt progress in new learning was slower, learning had become more independent which many students struggled with. Staying focused, distractions at home and learning to effectively use Office 365 for communication were a challenge. This provided the identification of another aspect of online teaching and learning that the CARC could consider addressing through interventions that help students to develop strategies to support them when working independently. There is a growing need for students to be able to work independently and the school shutdown and transfer of teaching online highlighted

this. There may be further school lockdowns as a result of the pandemic, and it is essential that we address this issue urgently.

Closely linked to the issues outlined so far, 17.6% of students specifically referred to "time" as the worst issue regarding online teaching and learning. Learning online presented difficulties in terms of the increased amount of time needed to effectively learn online. *"It takes much more time than the regular school process, which takes up a large amount of my study time".* Online learning required students to structure their day and organise their work to meet submission deadlines. When at school, students have a routine, which is structured around their timetable but with online learning this routine no longer existed. *"Trying to get organised and put a routine in place so that you get work done for deadlines, also finding time to study which I'm not as worried about anymore now the exams have been pushed back".* There was an indication that students were frustrated about the pace at which they were getting their work done. This seems to have impacted their self-esteem and confidence. *"It feels very slow, and as though I don't get through much at all".* Analysis to responses to the issue of time suggest that students experienced various pressures in learning online. The lack of routine, the slow speed of academic progress and failing to meet deadlines were issues students identified in this category. There is a sense from these responses that online learning was taking its toll on student's mental health. This would have consequences for student ability to sustain online learning. It was a further reason why we need to address the outcomes of this student survey with a series of interventions that would make online teaching and learning a better experience for more of our students. These interventions would focus on developing student independent learning, time management and organisational skills so that they will be better equipped to work on their assignments in future online experiences of teaching and learning.

9.5 CARC reflections on Phase 3 – Inhouse, Teacher Survey, Student Survey

As reported earlier in Chapter 8, the teacher survey findings indicated that teachers had undergone a major transformation in their adoption of ICT in teaching and learning. It is evident this transformation was as a result of the fact teachers were forced, overnight, to transfer teaching online when school was closed due to COVID-19. The strategies, I with the help of the CARC, had implemented through this research provided teachers with the ability

to transfer teaching online in an ordered and smooth manner. Without our interventions in collaboration with staff we would have been in a very different situation in reacting to the COVID-19 shutdown. The data in relation to skills before and after shutdown supports this view. Two thirds of teachers had some level of confidence in the use of ICT in teaching prior to shut down. The training the CARC, had provided to staff had significantly raised ICT skill levels which would have been key in facilitating the urgent transfer of teaching online. In addition, the final support provided to teachers through the intervention, prior to school closure, gave teachers a focused demonstration of how to use Teams in the coming weeks to support teaching and learning. Comments from staff on the day acknowledge that the training/demonstration provided by members of the CARC helped them to refresh their memory on the use of Teams and how to apply it to online teaching and learning.

> *"I had forgotten some of the steps involved in using Teams but following this demonstration, I have taken note of how I need to utilise Teams in my online teaching next week." "I found today's training very helpful and feel more confident to take on online teaching".*

Despite the fact that students had not originally been the focus of this research, they became extremely relevant to this research as teaching and learning transferred online. Having completed analysis of surveys undertaken by the key participants, teachers and students, in online teaching and learning, I was interested to examine the analysis of both set of results to consider how the outcomes from each survey provided further insight into the overall experiences of students and teachers during this time. One connection was between teachers gaining a better insight into their student's ability and those students who enjoyed working independently, meeting assignments deadlines and engaging with their teachers via Teams. Comments from the student survey; *"I learn a small bit from my mistakes by doing assignments and getting feedback" "Good, all my teachers give helpful feedback".* Teachers highlighted their delight and praise for such students *"students that are engaging with the process are getting a lot out of being able to work at their own pace from home". "Some very motivated students sending in great work and really engaging". "Allowing students work within a time frame, at their own pace, some are producing the best work I have seen from them".* This was a positive outcome from the surveys. It added to the richness of this research by providing a first-hand account of the potential online teaching and learning can have for students.

Alternatively, through the analysis of both surveys we were able to gain a different perspective into issues relating to student engagement and participation. Many teachers indicated in the survey that they were experiencing issues with student engagement online. They found it difficult to know if students were engaging with work they had set on Teams. They were not receiving assignments from a number of students and from others the submission of work was erratic. This was leading to frustration for teachers and worry that student attainment would suffer. The student survey provided a number of reasons why for many there was a lack of engagement and participation at times during the initial two-week closure. Primarily, students identified the volume of assignments as a major problem. Teachers independently would not have been aware of this as they worked from home in isolation of their colleagues. The proliferation of assignments resulted in students feeling overwhelmed, by the work set and the short deadlines provided. Students were able to provide clarity on other issues that impacted their engagement, issues such as poor internet, time management and the demands placed on them by family circumstances impacted their ability to engage fully online.

The urgent need to take action resulted in the adjustment of my initial research focus of "how could I as a senior leader work with teachers to improve their use of ICT in their teaching?" to "how can I as a senior leader work with teachers to improve their use of ICT in their online teaching?" The COVID-19 Pandemic created an emergency for school that had never been witnessed before given the need for teaching and learning to transfer online overnight. The actions I, with the help of my CARC members, took to work with teachers to enable them to meet the challenge they faced in adopting online teaching were central to the success of our provision of online teaching during school lockdown. The interventions we had created, firstly the short demonstration/training to staff on the day of school closure provided the necessary guidance and understanding to enable teachers to use Teams online. The issue of support for teachers during the school shutdown was addressed by us by providing an organised approach to staff support in the form of small staff teams coordinated by each member of CARC. This support had provided teachers with the additional help they required during the initial few days of shutdown. It also provided teachers with an avenue to seek help on how to use the assignments feature which through diffusion in the staff group became a major asset to student assessment. Carrying out the staff survey arose as a result of our individual engagement with each staff group and gathering insights into how our staff were coping with Online teaching and what further supports, they required. It was as a result of

this informal data collection that I suggested to the other CARC members that we undertake a Staff survey to gather valuable data on this unique experience. On carrying out this survey with teachers we gathered a wealth of information about their transfer to teaching online. We learned about the progress they had made in progressing their use of ICT, in particular Teams, to online teaching. This was critical for our research as it helped to provide an up to date record of how staff were progressing in their ICT competency and self-efficacy in its use in teaching. Arising from this survey we identified a substantial issue of student non-engagement in online learning. This created a need to undertake a further intervention of a student survey to identify why students were experiencing problems in engagement and for us the committee to consider actions that we could take to address this lack of engagement in future periods of online teaching and learning.

Chapter 10: - CONCLUSION

10.1 About this Chapter 10

This chapter sets out firstly to provide an overview of this research study. This is followed by a summary of the key findings in this study. I then explain the educational significance of my research. I provide a recap of the aims outlined in the introductory chapter and how I believe I have addressed these aims over the course of this research. This then leads to the conclusions I have arrived at based on the key findings. I then suggest a number of recommendations arising from this research before focusing on the key contributions I believe this research makes to my field of research. Finally, I outline what consideration I have for further action research based on the outcomes from this study.

10.2 Introduction

This was a collaborative action research study initiated from a ground up process, which identified an issue relating to the declining use of ICT by teachers in their teaching. The research question for this study was "how can I as a senior school leader work with teachers to improve their use of ICT in teaching?" As a senior school leader, I in collaboration with staff, believed action was required to improve the use of ICT in teaching so that student's learning experience would be enhanced and they could gain digital skills required for living and learning in this digital age.

This research makes a distinctive contribution focusing on the creation of an ICT innovative approach to undertaking classroom based assessments (CBAs), a relatively new teacher practice. We, the collaborative action research committee (CARC), adopted the "Collaborative Apprenticeship Model" approach to professional development in this study that supported teacher professional learning in a social setting where colleagues relied on the expertise and support of one another to create and adopt a new innovative practice. Learning experiences were enhanced as they are situated in the context of a classroom where they will be needed when they are required to carry out, with their students, their digital template.

An important aspect of this action was that this was the first time a department group, from our school, had engaged in this type of collaboration. It was also the first time they had worked together through a process in which they produced a shared digital product of an ICT template (Fig. 18) This template they would implement into their practice when carrying out their classroom based assessments (CBAs). A further unique aspect of this research is that it initially was planned as a single phase study but the COVID-19 Pandemic gave urgent cause to initiate phase 2 and to re orientate my research question to address and support teachers to teach online. My research question was altered to "how can I as a senior school leader work with teachers to improve their use of ICT in online teaching"? Actions I took with my CARC colleagues produced a distinctive set of findings, which provide an insight into this exceptional challenge and experienced by our teachers and students. Teachers transfer of teaching online was transformational in terms of the growth in their ICT competencies. A remarkable outcome that as a researcher I observed over the span of the two phases of this research was the growth in confidence teachers gained in their use of ICT and because teachers had little choice but to adopt online teaching they immersed themselves in building knowledge in an effort to provide students with the best online experience they could.

10.3 Key findings in this research

Phase 1 – The findings from this phase of my research are as follows: The vital role of CARC as teacher leader change agents. The positive outcome from the adopted ICT professional development approach which enabled teachers produce a new pedagogical digital approach, which they claimed would offer greater flexibility, provide ease of access and equity for students for CBAs. In addition, as a result of the adoption of this new approach, an important finding was the value volunteer teachers placed on the process of collaboration. Findings indicated that departments had two different collaboration experiences but in both cases these were positive. This collaboration became more embedded over the course of the intervention and produced signs of community with potential development of CoPs.

Phase 2 – The findings from this phase of my research are as follows: A rapid acceleration of ICT competencies due to urgent transfer to online teaching which was transformational for ICT in teaching. Finding indicated that this was aided by the support intervention provided by members of CARC in the initial two weeks of school shutdown due to COVID-19. Key

findings from Post Closure COVID-19 Teacher Survey related to the positive insight teachers gained of student ability through online teaching and negative issue of student non engagement. . Key findings from Post Closure COVID-19 Student Survey related to the positive experience some students experienced of independent learning while negative issues included overload of assignments, lack of ICT access and feeling of being overwhelmed and isolated.

10.4 Educational Significance

The following outlines the educational significance of my research and its findings not only for local contexts but also to the wider educational field relating to the study of ICT implementation and integration into schools and education settings.

In my experience, of almost thirty years working in the field of ICT in education, the process of ICT integration in schools has been very slow, if not stagnant at times. Marcus Quinn et al. (2019), undertook a study to examine how the lack of clear policy by the Department of Education and Skills has led to resistance by many stakeholders in embedding the use of technology into schools, and particularly teaching and learning.

Government policies originating from 1995, with the "Charting Our Education Future" which focused on "competence and understanding in practical skills, including computer literacy and information technology" (Unit 1997) through to the Schools IT 2000 initiative aimed at promoting a series of technological integration initiatives and address issues such as infrastructure and technical support. The Digital Schools Framework 2016 – 2020, followed and was developed to assist schools in effectively embedding digital technologies into teaching and learning. However, for many schools, ICT implementation was yet to take place at any structured organisational level and therefore considerations regarding embedding of ICT were premature. Despite how well developed these policies were strategically, in my school there was a large gap between policy and practice with regard to how schools implement ICT integration operationally. The reality is responsibility of ICT integration resides with schools at an individual level. Research suggests that much of the literature asserts that for effective ICT integration in classrooms to take place, the role of the school-

leader and teacher must be recognised under an established framework. (Vermeulen et al., 2016; Tearle, 2003).

> *According to Marcus Quinn et al. (2019,) "The best way forward is to embrace a bottom-up approach which would see schools harness the potential of digital technologies to support learning, to tailor teaching approaches and provide students with the skills they will need for the 21st century. In order for this to happen, the Department of Education and Skills needs to support schools in their decision-making, perhaps through providing a roadmap showing what successful technology use looks like.*

This research study provides an insight into how my school sought to operationalise and embed ICT integration through an approach similar to what Quinn et al recommend. We undertook a bottom up process of change and tailored teaching approaches through ICT adoption in response to the issue raised by our students, from ground up data gathering, regarding their need for increased use of ICT by teachers in their teaching.

The results of this study may be most important to the school, our school, where the study was conducted. However it may also be important to schools who may encounter challenges with improving the use of ICT adoption in teaching. Today, there is additional pressure on schools to accelerate their integration of ICT into teaching and learning. To do this schools must examine what best practice suits teacher needs so that they can fulfil the requirements for preparing students for today's digital world. With the rapid changes in ICT, there is a need for schools to keep pace with those changes in how they organise professional development that focuses on ICT usages in the classroom (Alt 2018). Our school, like many schools had because of limited opportunities to address the need for ICT professional development found it difficult to plan and organise professional learning for the staff body. As a result of this study, we found time and the outcome of this was it offered our school an insight into an alternative approach to teacher ICT professional development. This approach, rather than providing ICT professional training for all staff members at one time, provided us with a framework that focused on small group ICT training, which was more manageable in terms of time. It offered our teachers time to engage in collaboration that enabled them to socially construct ICT knowledge and provided them with time to reflect on practice. In addition to this this model provided an opportunity to address the challenge of isolation that can inhibit teachers' learning enabling peers to assist in building ICT knowledge and competency (Glazer and Page 2006). Findings highlighted that teachers welcomed this

approach to ICT professional development as it not only increased their ICT competence, but it also provided them with new opportunity to collaborate together on a shared ICT project that they believed would enhance their teaching and student learning. This is highlighted by the following response

"*The biggest thing is that the template has happened because we all sat down and worked on it together"* and *"Collaboration made this happen". Geography teacher*

The innovative approach undertaken in this research resulted with combining technology and classroom based assessments (CBAs). This in itself, I believe, offers new contributions to the subject of CBAs and the challenge teachers and students experience in undertaking CBAs. As the reader will see, I set out with this particular pathway focusing on the integration of CBAs and technology, responding to teacher and student concerns. Teachers had outlined their concern regarding the type of ICT professional development they would like, the task focused approach to this development and the need for training in not only how to use the innovative approach technically but also pedagogically. However in the early phase of the research, the Global pandemic that was COVID-19 arrived on our shores and this prompted the re-orientation of my research. The impending and subsequent closure of schools by the Irish government, gave cause for prompt and urgent action to prepare teachers to transfer their teaching online. We were fortunate to have initiated this research some months earlier which had enabled teachers to build ICT competency and familiarity with the Office 365 platform. The task for me as lead researcher, supported by the other members of CARC, was to create a set of interventions that would not only prepare teachers to transfer teaching online but to also support them during school closure.

Given our long history of ICT, the efforts and initiatives undertaken to promote the use of ICT in teaching and learning, it was critical to me as a senior school leader and long promoter and innovator of ICT in our school that I undertook this research to address the concerns of our students. We as a school have a responsibility to provide the best standard of education we can to prepare our students for the digital world in which we live.

10.5 Summary of research approach

I undertook this study by adopting a Collaborative Action Research approach. This approach provided my research and me as lead researcher with results that were driven from a bottom up direction. This meant that the decisions I took were informed by the teaching staff of our school. It was critical that teachers were fully engaged in finding a solution to this research question, "how can I as senior school leader, work with teachers to improve their use of ICT in their teaching?" These collaborations were vital to progressing this research. My fellow CARC colleagues engaged with this research and through our collaborations we were able to progress this research through two contrasting phases. It was clear that the qualities of Collaborative Action Research engendered a sense of community. We observed this in data gathering when we worked with the volunteer group of teachers who shared their thoughts and opinions with us showing great generosity and interest. We observed it again, when we worked with the teachers from the Mathematics and Geography departments who also engaged fully with the research process and displayed signs of embedded communities. In phase two of this research with the requirement of teachers to transfer to online teaching, our engagement with them in school and post school shutdown was very much community driven in how teachers were keen to help each other and support each other as we sought a way forward during very difficult days.

10.6 Recap on Research Aims

Based on my research question I identified two main aims of this research. These were'

A. Aim 1: To initiate a whole staff examination of ICT use in school practices.
B. Aim 2: To create a series of action research interventions, using a newly adopted ICT professional development approach, to enable teachers to adopt, implement and review an innovative ICT approach to their practice.

Aim 1

This process I undertook in collaboration with staff led to a period of whole staff examination of practices which followed the process outlined below and clearly demonstrates that Aim 1 was achieved.

On identification of an issue, from a student survey, which highlighted the decline in use of ICT by teachers in their teaching, I relayed this finding to staff. The immediate reaction of teachers was to address this problem and a number indicated that they were aware that there was an issue. Teachers explained that they had relied on the learning hub, a website created almost twenty years earlier for sharing resources with students but as time has passed the general feeling was that the hub was now out dated and very limited. This was one reason for the decline in use of ICT in teaching. There was, however a strong indication from these discussions that teachers were keen to find a solution so that they could progress their use of ICT in their teaching. They suggested the examination of adopting a new ICT framework which could provide staff and students with a new start to their adoption of ICT. Following the examination of possible options for a new school ICT framework by a volunteer ICT staff committee, Microsoft Office 365 was identified as a new ICT school framework. Following this the ICT committee planned, implemented and delivered training and support to staff in the tools of Office 365.

Aim 2

A short summary of the process we, the CARC, undertook to achieve this aim, with one exception is detailed below.

We began by undertaking a detailed process of reconnaissance which required data gathering measures of a staff survey (see Appendix B) and the holding of a validation focus group meeting to examine the results of the survey and provide further clarity and details to the data gathered. Following on from this our collaborations enabled us to identify a strategy for undertaking a series of action interventions to address the research question. This strategy was to create a series of interventions which would focus on one main Office 365 tool, OneNote to create a template that teachers could use to carry out their CBAs with their students. Results from data gathering had also highlighted the need to adopt a new approach to ICT professional development. Teachers were keen to move away from the traditional sit and get format of ICT training and move to a form of training that would be situated in a social group where they could interact and learn new ICT skills together. I identified the collaborative apprenticeship framework which would provide teachers with the model of professional development they were keen to experience.

We then identified two subject departments who were shortly to undertake their first CBA with second year students. We invited their teachers to participate. Seven teachers volunteered and engaged with us, in a series of three CBA OneNote Professional training interventions. Through their participation they had the opportunity to engage in a collaborative approach to learning OneNote. Through collaboration with their small group of department colleagues, teachers were able to experience learning together, construct and share knowledge to enable them together to focus on the OneNote task of producing a CBA template which they could all adopt and implement in their CBAs over the course of the following weeks. So far we had achieved this aim however, these teachers did not get the opportunity to implement or review this new approach to undertaking CBAs as within days of completion of intervention 3, schools in Ireland were closed to prevent the spread of COVID-19.

10.7 Conclusions based on Key Findings

Based on the findings outlined in each of the chapters 6, 7, 8 and 9, I have drawn the following conclusions with regard to;

Phase 1

A. Managing change in our school, from a leadership perspective both as a senior school leader and as lead researcher, I can conclude that the process of change is powerful, if driven from a bottom up approach. The inclusion and involvement of staff throughout this research process, at a general staff level and through the various teacher groups I and my CARC colleagues engaged with, provided the catalyst required that propelled teachers to evaluate their current ICT practice and together focus on improving their use of ICT in their teaching.
B. ICT professional development training: From this study I can conclude that the collaborative apprenticeship model of professional development was viewed to be a very positive alternative approach that allowed them to work and learn collectively as opposed to learning in isolation.
C. Teacher collaboration in this research, I can conclude, enabled a strong group focused approach to their creation of a shared template. Teachers who participated in this

research did so because of their motivation to finding a solution as a department to undertaking CBAs, a new practice for all participants. Through three action interventions teachers engaged collaboratively together and through active exchange of knowledge and ideas, produced a digital template they all could adopt in undertaking their CBAs which would benefit their students in their experience of teaching and learning.

D. Teacher collaboration enabled department groups to create their OneNote template. However, even though collaboration led to departments creating their OneNote CBA Template, I can conclude that the process of teacher collaboration was not always easy and at times was challenging. However, both departments were positive about their collaborative experience.
E. Working with my CARC colleagues provided this research with a very strong focus on collaboration and was key to the incorporating staff input and ownership of the change process. My CARC colleagues took on the role of change agents. In doing so they demonstrated what Beven (2018) had claimed that change agents have the power, individually and collectively, to make a positive difference. Their contribution to this research and to staff in our school was immense. They endeavoured at every stage of this research to support and engage with teachers to improve teachers ICT competencies. They were central to the creating and sustaining momentum by engaging with staff regularly through meetings, training, email with the staff group over the two year period. `

Phase 2

Actions taken by me and my CARC colleagues during this exceptional time of challenge and experience produced the following distinctive set of findings from which I draw these conclusions:

Support Intervention

I conclude that:

A. The support intervention implemented by CARC, on school closure provided a bridge for teachers in their transfer from in school teaching to online teaching. It provided

teachers with help and support from CARC in the use of Teams. It provided a form of support that enabled teachers to develop greater expertise and to foster relationships between colleagues while also responding to learning needs (Hertzog 2002). Findings indicated that this provided a much-needed connection, at a time where many staff felt isolated from their colleagues, with the members of CARC and enabled teachers to gradually build their confidence and skills in delivering teaching online.

Post Closure COVID-19 Teacher Survey

Following outcomes from the support intervention, we decided to undertake a Post Closure COVID-19 Teacher Survey to establish how teachers were coping with teaching online and to identify any issues we, the CARC members, could address: From the results of this survey, I can conclude:

B. Teachers had a positive experience in how online teaching had offered them a new insight into student ability. It also afforded teachers with the opportunity to provide a more detailed assessment in the form of formative and summative feedback. This was clear from findings from the Post Closure Teacher Survey in which teachers claimed that.

"*Allowing students work within a time frame, at their own pace, some are producing the best work I have seen from them" and "getting to see students' work up close regularly so I can get an even better idea of how they are doing with a subject and/or task".*

These responses demonstrate and verify the value teachers put on this aspect of online teaching.

C. One overarching negative experience highlighted by teachers, which led to the need to conduct a Post Closure Covid-19 Student survey, was the number of students who failed to engage with their teachers online. Teachers found this frustrating as there was little they could do about it.

"There are obviously a number that don't appear to be engaging".

"No, little, or inconsistent engagement from students".

One additional negative aspect was highlighted by the language teachers was their problem in delivering the curriculum given the nature of their subject.

"Teaching a language in the classroom involves a lot of encouraging and explanation of vocabulary and grammar but with online learning support this is missing and therefore I have to give enough written information to the students so that they can understand the new material".

For languages, accessing listening comprehensions can be difficult for students - accessing eBooks etc. requires a lot of explanation that a number of students may find too difficult to do on their own".

From these responses I can conclude that teachers were having problems with students adapting and adopting online learning. Given the extended period that school was closed, and what further school closures we would encounter, this was an issue we concluded must be examined through a Post Closure Covid-19 Student Survey.

The following outline the conclusions drawn from key results from the student survey. I can conclude:

D. The positive experience of online teaching and learning for students was, for many, the opportunity to work independently and something they really enjoyed. These findings arose from the Post Closure COVID-19 Student Survey. Findings identified some very positive aspects of student experience. Their responses below highlight what students enjoyed about online education;

"Taking notes is easier because you can do it at your own pace.".

"I can go about my day in a more flexible way".

"Flexible working hours lead for better concentration on my work.".

"It has been easy to learn new things without spending most of the day in school".

"I like the fact that I can get work done prematurely and send it in quicker to free uptime elsewhere which couldn't always be done in school".

"I'm finding studying a lot easier because I have more time".

These responses illustrate that for a portion of our student body the ability to learn at their own pace, the flexibility it offered and being able to organise homework in their own way and in their own time, I can conclude was a welcome and enjoyable experience.

E. Online teaching and learning did negatively affect many of our students and were an indication of the possible reasons for student non-engagement. Responses highlighted that students often felt overwhelmed with the amount of assignment teachers were setting.

"Some teachers giving large chunks of difficult material within a short time frame with vague instructions, it is overwhelming and often doesn't get completed by the majority of students".

This feeling of being overwhelmed I can conclude resulted in students feeling stressed and worried about the build-up of assignments.

The stress all the time due to the mountain of assignments ahead of me".

In contrast, I can conclude that the students who enjoyed independent learning many students expressed how difficult they found studying and learning online

"Not being in a classroom environment and staying focused at home was hard for me. "Being distracted in my own home by the tv, my phone or family".

"I'm not getting learning done, I find it hard to keep up with all the assignments".

"I find it hard learning new topics alone".

Online teaching and learning changed the way in which students communicated with their teachers. This was difficult for students who missed the face to face interaction they were used to.

"Difficult sometimes because it would be better to ask the teacher the questions in class instead of annoying them with loads off messages online".

The issue of time impacted student online learning. For many students, finding time to do all the set schoolwork was very challenging and this led to student responses;

"It's takes much more time than the regular school process, which takes up a large amount of my study time."

"Trying to get organised and put a routine in place so that you get work done for deadlines, also finding time to study which I'm not as worried about anymore now the exams have been pushed back."

"It feels very slow, and as though I don't get through much at all."

From these findings on the negative aspects of student experience of online teaching and learning, I can conclude that they highlight a strong division between students who enjoyed the opportunity to study and learn independently and students who were extremely challenged in engaging with online teaching given their dependency on classroom teaching and learning. I also can conclude that given the rapid transformative process teachers and students engaged in over this short time period, we established a greater insight into teacher's and student's experience of the sudden challenge to transfer to online teaching and provide students with support in their learning in this new ICT context.

Theoretical Frameworks Conclusions

F. In this research I drew from the lens of Social Constructivism. I can conclude that this theoretical lens provided me with a clear insight into how effectively teachers learn together. My observations and interactions with teachers during the OneNote CBA interventions let me see how much better a social context for learning is than the isolated approaches taken in the past of ICT knowledge construction.

   According to Vygotsky learning does not just take place within the individual instead he argued that "learning is a social and collaborative activity where people create meaning through their interactions with one another" (Schreiber and Valle 2013, 396). In this study volunteer teachers participated in a social and collaborative activity of creating a OneNote CBA template. This, they produced through meaningful interactions with each other over a period of three action interventions. Nawaz et al. (2010) claim that "collective learning" is central to the social constructivist framework (Nawaz and Kundi 2010). Collective learning was central to my study by both departments worked collectively, learning and sharing knowledge with one another on how to create their OneNote CBA template. In this study we witnessed

what Nawaz et al. (2010), describe regarding social constructivism and that is that learning is active, contextual, situated within their own practice and social. This study supports the claim of Bondarouk, (2006), who claims that social constructivists explain the technology-adoption as a process of involving social groups into the innovation process where learning takes place on the learners' experiences, knowledge, habits and preferences.

G. In this research I also drew from aspects of Roger's diffusion theory. In particular I identified the roles of change agent and opinion leader as important roles to include in particular to phase 1. I can conclude that the harnessing of both roles helped to increase the rate of adoption of OneNote over the course of the three interventions. Through this research we were working with teachers to help them adopt change in their practice through improved use of ICT in their teaching. Roger's theory promotes the identification of opinion leaders to help accelerate the diffusion and change process. A change agent is "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (Rogers 1995, 27) My CARC colleagues took on the role of change agents in this research. They did this by encouraging and supporting volunteers throughout the three action intervention process in their creation of the OneNote CBA template. In addition to this they were instrumental in encouraging "opinion leaders" within each department group to volunteer for the role as team facilitator. The opinion leaders were instrumental to supporting and encouraging their department colleagues in the adoption of OneNote and their participation in the joint task of creating the OneNote CBA template.

10.8 Recommendations

This study spanned two very distinct periods in the life of our school. At the start we, as a school faced an issue, not unique, of the declining use of ICT by teachers in their teaching. From my experience in this study I would make the following recommendations by highlighting a. the recommendation (what is needed?) and b. How I recommend it is actioned?

Recommendation 1: From the experience I have gained as a senior school leader in this research I recommend that when initiating a change process, especially one that impacts directly on teacher practice, such as that of the integration of ICT, a bottom up change management approach is considered.

How they will be actioned? A bottom up change management seeks to involve all those affected in the process of change. According to Anderson (2020), a bottom-up approach is often associated with an emergent change process like trends in technology that demand rethinking. As teachers are most affected by the process of ICT integration, actions in which teachers are provided with opportunities to have their say must be taken. Actions such as those adopted in this research were meetings and surveys, provided me and my CARC colleagues with key data that informed the decisions we took in progressing and supporting this change process. Teachers must not only be engaged in finding a solution but they must also feel ownership of the solution.

Recommendation 2: Senior school leadership, in seeking change, are recommended to foster, understand and value distributive forms of leadership throughout the school organisation.

How this will be actioned? This research has highlighted the significance of dispersed leadership, particularly in identifying teachers who can potentially become leaders within the teacher community to support and assist the change process. Senior school leaders should consider promoting a culture that encourages and empowers teachers to take on leadership roles. Teachers who volunteer to help in various aspects of school life should be acknowledged and supported for their work. Identifying and encouraging potential leaders such as change agents or opinion leaders, as adopted in this research can help to increase diffusion and adoption of change within the teaching staff. In terms of this research change agents such as CARC, helped to accelerate change. Change agents who either emerge or are encouraged to emerge can contribute to supporting the change process.

Recommendation 3: The adoption of a social constructivist approach to professional development.

How this will be actioned? Findings from this study highlighted that teachers were looking for diversification in terms of ICT professional development. They were critical of the

traditional approach to ICT professional development in the school, which was instructor led. Teachers no longer wanted to be passive learners, in building their ICT knowledge, which they found limited, they wanted to be active in their learning in the form of a social group where they could share and construct knowledge together rather than the isolated approach they previously experienced. It was our teachers who, in their discussions and descriptions of how they wanted to learn directed me and my research committee, to adopt a social constructivist approach to their ICT professional development. This demonstrated how practice gave rise to theory in this study. This led to the identification and selection of the collaborative apprenticeship model which promoted a social constructivist approach to learning. The outcome from the adoption of this proved a positive experience in terms of their ICT knowledge growth but also in highlighting the power of collaboration they as a department could harness in future projects.

Recommendation 4: Leadership must support and make resources and opportunities available for small group staff collaborations.

How this will be actioned? This follows recommendation 3, as the experience the volunteers had regarding the approach we took to their ICT professional development delivered more to the group than growth in ICT knowledge. One key finding was the opportunity and value this format provided to teachers as they experienced an embedded form of collaboration. Even though in this study we focused on subject department groupings this does not necessarily need to be organised in this way. There are opportunities to group teachers according to the year groups they teach in addressing issues that may arise or the option of teachers focusing on developing cross curricular projects has the potential to promote, encourage and establish a greater culture of collaboration within the staff community. By strengthening teacher collaboration and their opportunities to focus on a shared problem of subject of interest has the potential to enable communities of practice to emerge . As communities of practice emerge they have the ability to promote and encourage knowledge sharing which can lead to further cultural change, share best practice, support organisational development, all of which can only have positive outcomes for teachers and student experience.

Recommendation 5: Given the urgency that brought us into a second phase of this research, it is now important for schools to evaluate their experience of online education and consider the outcomes and experiences which may inform future planning.

How this will be actioned? What happened to schools in March 2020, with the rapid school closure, the immediacy of transfer of teaching and learning online was such a critical event that I believe it is important for schools to evaluate how they met and supported the challenges imposed on them by COVID-19. We have now begun to unwind the restrictions posed by governments in their attempts to stop the spread of the disease. The process school underwent must be examined and evaluated to see what learning there is in it for the school, teachers, students and parents. No one knows if we will encounter a further pandemic in our lifetime but if we do then schools should consider to put a strategy in place so that the issues raised, similar to those raised in my research from the teacher and student online surveys, will be addressed and provide a smoother, structured transfer to online teaching and learning.

10.9 Contribution of this research

This study has drawn together for the first time different bodies of literature to explore a specific issue relating to improving the use of ICT by teachers in their teaching. In doing so it has added to knowledge as it combines key aspects from my literature review regarding, change management, the adoption of the collaborative apprenticeship model as a form of ICT professional development which incorporates a social constructivist lens and draws on Rogers diffusion of innovation theory to enable teachers to create a new collaborative digital approach to undertaking classroom based assessments. This research originated from a bottom up review that initiated the need for change and as a senior school leader the management of this change. By adopting the collaborative apprenticeship model to a setting such as our school provides knowledge on the validity of this approach to teacher ICT professional development. The outcomes from this research show how effective this approach, when applied to our context, was. This enriches the body of knowledge relating to this ICT professional development framework. The adoption of a social constructivist approach came from a bottom up change process and provides knowledge on how practice can lead to theory formation.

My contribution to knowledge primarily relates to the research area I selected, working with teachers to improve their use of ICT in their teaching. In the first phase of this research in adopting a collaborative action research methodology, I have added to the knowledge regarding the application and implementation of this method of research in a school setting. The methods I chose provide findings that have added to the knowledge of collaboration, digital approaches to classroom based assessment and ICT professional development. Research I have reviewed in Chapter 2, indicated the need to move from the traditional form of professional development to a more active participatory form, where teachers could learn from each other and focus this learning on their practice. In phase 1 of this research, I with my CARC colleagues adopted such an approach and in doing so evidenced and added knowledge to the positive outcomes in changing the format of professional development from a "sit and get" practice to a collaborative community approach where teachers learned and shared knowledge to produce a new model to undertaking their classroom based assessments. Roger's theory which identified leadership models of change agents and opinion leaders were instrumental in this study and their role provides additional knowledge to these aspect of Rogers's diffusion model and how the inclusion of these models of leadership can add to the knowledge regarding the change process.

As a result of this study, a further contribution of my research is my production of a template for schools and education boards who wish to adopt an alternative approach to the traditional form of ICT professional development (Fig. 20). This template provides schools with the summarised details of how to prepare and implement the Collaborative Apprenticeship model of ICT Professional Development in their schools. This form of professional development can be expanded beyond the focus of ICT to the provision of Professional Development in other teacher practices such as approaches to differentiation in the classroom, student assessment or the provision of a student centred focus in the classroom. All of these practices are shared by teachers either by subject or year group and therefore could form the focus of professional development which would result in small communities of teachers creating and developing a new plan or approach to such practices. The template is organised in steps and these steps are framed in colours of red, green and blue. Framing the steps in these colours highlights the influence of Roger's Diffusion of Innovation theory (red), collaboration (green) and social constructivism (blue) at different stages of the process. An example of this is step 3, in green, where collaboratively the voluntary collaborative committee (VCC) devise and agree on a strategy and task which will require teachers to

integrate ICT into one aspect of teaching. In step five, red, the VCC focus on building informal leadership of opinion leaders within the small teacher groups, drawing from one element of the Diffusion of Innovations theory. The interventions stage follows step 8, which in this study was carried out over three sessions and in doing so provided adequate time for an effective outcome in learning and producing a joint CBA OneNote template.

In addition to the detailed template, I have provided in (Fig. 21) a user friendly guide which provides a visual display the process of this type of professional development. It is aimed at illustrating to schools the progression of learners from novice to expert through the application of the Collaborative Apprenticeship model and the trainer's transition from instructor to facilitator. This is provided to support teachers who may wish to undertake a similar approach to providing ICT professional development.

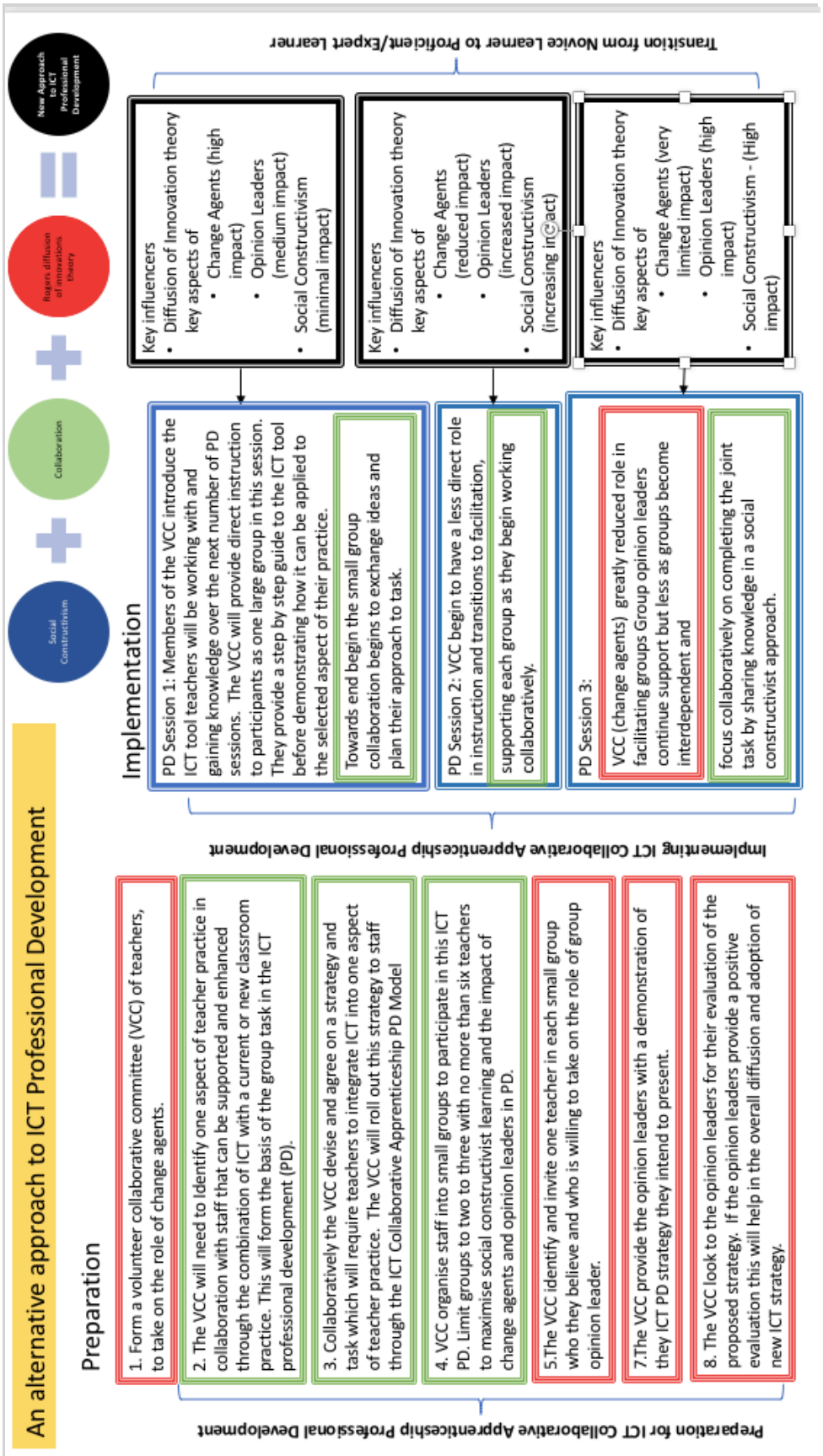


Figure 20. An alternative approach to the traditional form of Teacher ICT professional development

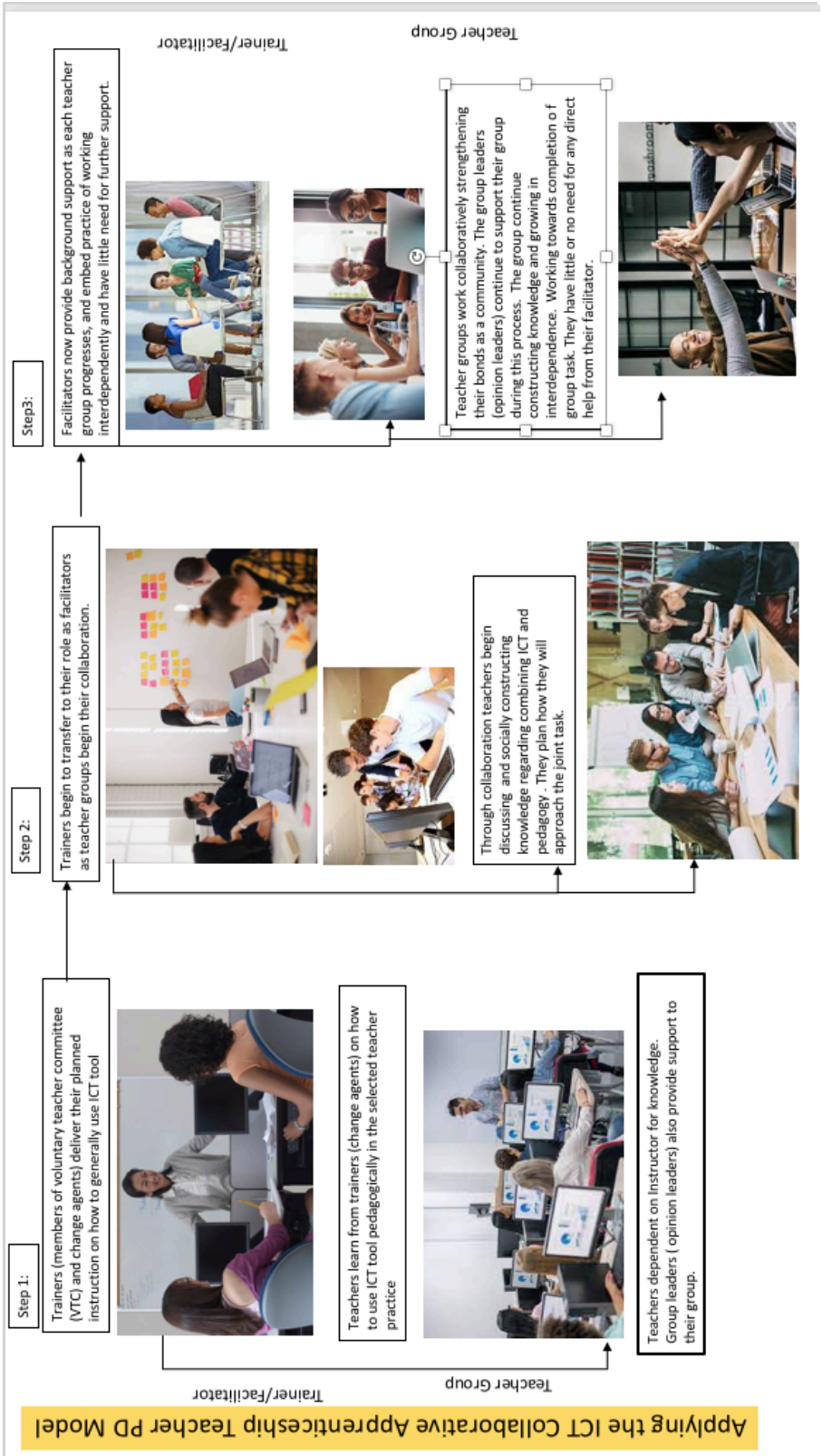


Figure 21. Visual display outlining the process of teacher ICT professional development

In the second phase of my research, the methods chosen provided a rich set of unique data, regarding the experience of online teaching and learning in a pandemic. The re-orientation

of my research focus provides a contribution to that, I believe is valuable as traverses a time before and after the transfer of teaching online in a time of emergency resulting in considerable fear and anxiety by teachers and students. Through my research I gathered a body of knowledge of how teachers and students experienced the new and difficult situation they found themselves in having to engage with online teaching and learning. The knowledge produced from this phase of my research relates to the unique context teachers and students found themselves in and provides an important contribution to the field of research relating to the impact of COVID-19 school shutdown on teaching and learning.

In terms of current research in my field I identified research carried out by Bubb and Jones. (2019) who also undertook a study relating to home schooling and learning during COVID-19. My findings add to the body of knowledge Bubb et al. produced and provide some contrasting findings regarding the improved ICT competencies of teachers during this period as noted in Chapter 8. Gudmundsdottir and Hathaway are also researchers in my field of study and they carried out research on teachers' readiness for online practice as a result of COVID-19 in 2020. Their findings mirror that of mine, that teachers displayed a positive approach to their transfer of teaching online and were 'willing to go the extra mile'" to help their students during the COVID-19 shutdown. My study therefore adds to the data set relating to teacher readiness and commitment to their students through their online teaching.

Research carried out by the OECD (2021), found that online teaching and learning put greater demands on "autonomy, capacity for independent learning executive functioning, self-monitoring, and the capacity to learn online. It is likely that some students were more proficient than others and that, as a result, they were able to learn more than their peers while not in school" (OECD 2021). From my research study I can provide evidence that this was the case and that a portion of our student population welcomed this opportunity for independent learning. Additionally in this report the OECD claim that "approaches to using technology to support teacher professional development and collaboration, and to cultivate student autonomy and independent learning, should be fostered" (OECD 2021, 8). My research has fostered using technology with professional development with collaboration at the centre. My findings in relation to all three aspects will therefore contribute to and provide an account of how these approaches were fostered and developed over the course of this research.

10.10 Considerations for further Action Research

Phase 1: Given that this research phase was cut short by the arrival of COVID-19 and the subsequent rapid closure of schools, I would like to continue on in this process of implementing the CBA Templates created by the Mathematics and Geography departments and continuing the collaborative action research process to evaluate and reflect on their implementation and identify what changes may be required before they are implemented for students second CBA.

Phase 2: Following the analysis of the teacher and student surveys I would like to consider addressing these issues raised in particular there is a need and an opportunity to focus ICT professional development on addressing the need for teachers to learn how to integrate pedagogical approaches to their use of ICT in teaching. The divide between students who learned independently and those who did not requires some attention. Given that the skills of independent learning "are all essential skills for now and for the future"(OECD 2021, 8) There is a need to examine this issue and identify possible strategies to support student learning.

10.11 Conclusion

This chapter has provided an outline of the research I conducted in two phases in collaboration with my CARC colleagues. It provides a discussion on what I believe is the Educational Significance of my study and its findings. I reflect on the implementation of my chosen research approach and the benefits I believe resulted from this approach to my research. I review my research aims and explain how I believe I achieve almost all of these aims, and why I failed to achieve them fully. I outline a series of conclusions that I have drawn from conducting this research focusing on Phase 1 & 2 and my use of the lens provided through two theoretical frameworks I referred to throughout this study. Following this I provide a series of recommendations resulting from my experience of conducting this research and how my experience might inform researchers in the future who are considering the process of change in their school. I then outline how my research has led me to consider further research within my school. I offer short reflections on aspects of this study before arriving at this conclusion section.

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Hi Leaving Cert Students

As we have already mentioned to you we value your reflection on the time you spent in Colaiste Muire.

We would like to learn from your experience of our school. We would like to know what you really found helpful and what you enjoyed during your time with us. We would also like to hear your suggestions as to what we could do to improve the experience for our students, especially in their Leaving Cert year.

The purpose of this is to create a positive discussion on your journey through the school. This is not an opportunity to personalise comments, it is an opportunity for Management and Students to collaborate so that together we can look at ways to change and possibly improve the learning experience in our school.

This is an anonymous survey. We request that **no names** are used in answering questions or giving your reflections.

Thank you for taking part, it is important that all student have the opportunity to share their reflections.

Mr O'Brien & Mrs Kenneally

1.
How many years have you spent in Colaiste Muire?

Ok

2.
Please give your rating regarding the following areas of school life. (CM = Colaiste Muire)

	1 = least score you can give 5 = best score you can give				
	1	2	3	4	5
I felt supported in my preparation for LC in CM	○	○	○	○	○
I felt supported in the area of mental health in CM	○	○	○	○	○
I always knew there was someone in CM I could approach if I had a problem	○	○	○	○	○
I availed of counselling services in CM during LC	○	○	○	○	○
I am happy with my subject choices in Senior Level	○	○	○	○	○
I was happy with the range of subjects to choose from at Senior Level	○	○	○	○	○
I got good advice re change of levels / subjects	○	○	○	○	○
I developed close friendships during my time in CM	○	○	○	○	○
I got on well with my teachers at senior level	○	○	○	○	○
I got good support around study plans and revision.	○	○	○	○	○
There were good provisions re after-school and weekend study.	○	○	○	○	○
I was well prepared for the LC exam by my subject teachers.	○	○	○	○	○
The code of behaviour was applied fairly and consistently	○	○	○	○	○
I felt I had a voice in what was happening during LC	○	○	○	○	○
I consider CM to be a safe and healthy environment in which to prepare for Leaving Cert.	○	○	○	○	○
CM is a school where mutual respect is valued and promoted at all levels.	○	○	○	○	○
I had opportunities to develop my leaderships skills and personal growth	○	○	○	○	○

Ok

3.
What comments have you on your learning experience over the two year Leaving Cert Programme? (Study, Homework, Revision, Exams)

Ok

4.
What comments have you on Discipline and procedures outlined in the Code of Behaviour?

Ok

5.
Did you feel you had a voice to say something regarding school issues?

- [ ] Yes
- [ ] No

Ok

6.
Can tell us a little bit more about this?

Ok

7.
Can you reflect on your experience of wellbeing in school. What was your experience of feeling safe and happy in school? (Friendships, Anti Bullying Committee, Counselling, Ease in approaching teachers)

Ok

8.
Do you feel you were challenged academically during your Leaving Cert Course? Discuss reasons for answer.

Ok

9.
What was your experience of the use of IT (Computers, Learning Hub, Online Learning tools) in the classroom? Tell us how much you expeienced the use of IT by teachers and if it was helpful etc.

Ok

10.
What was your experience of Management in the school? (Principal, Deputy Principal, Year Heads)

Ok

11.
Are there changes you would like to see in CM which would benefit the student body?
- [ ] Yes
- [ ] No

Ok

12.
If yes, can you make suggestions?

Ok

13.
Additional information you would like to include...

Ok

14.
Select the emotion that describes your time in Colaiste Muire.

Ok

15.
Select the emotion that describes your feelings on leaving Colaiste Muire.

Ok

16.
Rate your overall experience in Colaiste Muire over the time you have been there.

Ok

Part 1 -Teacher Questionnaire on the use of Digital Technologies in Teaching and Learning

The Board of Management of our school has given permission for the undertaking Collaborative Action Research with the aim of increasing the use of Digital Technologies in teaching and learning.

This questionnaire we hope will help us to gather key information which will enable us to determine what can be done to improve the use of ICT by our teachers in teaching and learning.

Read and answer each question carefully and ask for help if you do not understand something or are not sure how to respond. Answering this questionnaire should require you about 15 minutes.

All responses are anonymous and are treated in strict confidence.

Thank you very much for your collaboration. Your input is really important for our study.

* Required

* This form will record your name, please fill your name.

Background information

3/10/2022

1. Age *

- ○ under 30
- ○ from 30 to 39
- ○ from 40 to 49
- ○ 50 or over

2. Gender *

- ○ Female
- ○ Male
- ○ Prefer not to say

3. Subject(s)/Area *

- ☐ English
- ☐ Irish
- ☐ Mathematics
- ☐ Sciences
- ☐ Modern Foreign Languages
- ☐ Practical Subjects
- ☐ Physical Education
- ☐ History
- ☐ Geography
- ☐ Special needs
- ☐ Other

3/10/2022

4. Average number of students per class: *

- [ ] Fewer than 10
- [ ] 10 - 24
- [ ] Over 25

5. Teaching hours per week: *

- ○ fewer than 10
- ○ 10-15 hours
- ○ 16-20 hours
- ○ 21+ hours

6. Including this school year, how long have you been teaching (at any school)? *

- ○ Less than 1 year
- ○ 1-3 years
- ○ 4-10 years
- ○ 11-20 years
- ○ 21-30 years
- ○ More than 30 years

Experience of using Digital Technologies (ICT) for teaching and learning

7. Select 'yes' or 'no' for the following statements: *

	Yes	No
Digital Technologies (ICT) is taught as a separate subject	○	○
Digital Technologies (ICT) is integrated in my subject because I choose to do so	○	○
Digital Technologies (ICT) is integrated in my subject because of curriculum requirements	○	○
Digital Technologies (ICT) is integrated in several subjects	○	○

8. Do you use Digital Technologies (ICT) for the following activities? *

	Yes	No
Preparing Lessons	○	○
Storing & sharing classroom resources	○	○
Collaborating with Colaiste Muire staff	○	○
Communicating with Colaiste Muire staff	○	○
Teaching my class	○	○
Setting Homework	○	○
Project work with students	○	○

9. For how many years have you been using digital technologies (ICT) at any school? *

- ○ Less than 1 year
- ○ Between 1 to 3 years
- ○ Between 4 to 6 years
- ○ More than 6 years

10. How often do you use digital technologies (ICT) in your classes? (Excluding calling the roll on VSware) *

- ○ Never
- ○ Once or twice a month
- ○ Once or twice a week
- ○ Once or twice a day
- ○ All the time

11. When you use DEVICES during teaching a class, which equipment is available? *

	Never	Rarely	Sometimes	Often	All the time
Students are equipped with devices	○	○	○	○	○
Only the teacher is equipped with a device	○	○	○	○	○
Both, teacher and students equipped with a device	○	○	○	○	○

12. When you use WIFI during teaching a class, which equipment is available? *

	Never	Rarely	Sometimes	Often	All the time
Students are equipped with devices	○	○	○	○	○
Only the teacher is equipped with a device	○	○	○	○	○
Both, teacher and students equipped with a device	○	○	○	○	○

13. Which conditions do you have access to in your classes/classroom? *

	Yes	No
Desktop computer without internet access	○	○
Desktop computer with internet access	○	○
Non-internet-connected laptop, tablet PC, netbook or notebook computer	○	○
Internet-connected laptop, tablet PC, netbook or notebook computer	○	○
E-reader (a device to read books and newspapers on screen)	○	○
Mobile phone/Text services provided by the school	○	○
Interactive whiteboard	○	○
Digital camera or camcorder	○	○
Computer laboratory	○	○
Student response system (e.g., Forms, Survey Monkey, Padlet etc. or other)	○	○

14. Are the students allowed to use their personally owned devices listed below at school for learning? *

	Yes	No
Laptop, tablet, netbook, notebook	○	○
Mobile or Smartphone	○	○

Support to teachers for use of Digital Technologies (ICT)

15. Is participation in ICT training compulsory for teachers in our school? *

- ○ Yes
- ○ No

16. Have you ever undertaken professional development in the following areas? *

	Yes	No
Introductory courses on internet use and general applications (basic word-processing, spreadsheets, presentations, databases, etc.	○	○
Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment, etc.)	○	○
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)	○	○
Equipment-specific training (interactive whiteboard, laptop, tablet, etc.)	○	○
Courses on the pedagogical use of Digital Technologies/ ICT in teaching and learning	○	○
Teaching and learning applications (e.g. Teams, tutorials, simulations, etc.)	○	○
Course on multimedia (using digital video, audio equipment, etc.)	○	○

	Yes	No
Participate in online communities (e.g., mailing lists, groups, blogs, Facebook, WhatsApp, Twitter) for professional discussions with other teachers	○	○
Digital Technologies/ICT training provided by school staff	○	○
Other professional development opportunities related to Digital Technologies/ICT	○	○
Personal learning about Digital Technologies/ICT in your own time	○	○

17. Please indicate any interest you might have in the areas of professional development? *

	Interested	Not interested
Introductory courses on internet use and general applications (basic word-processing, spreadsheets, presentations, databases, etc.	○	○
Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment, etc.)	○	○
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)	○	○
Equipment-specific training (interactive whiteboard, laptop, tablet, etc.)	○	○
Courses on the pedagogical use of ICT in teaching and learning	○	○
Teaching and learning applications (e.g. Teams, tutorials, simulations, etc.)	○	○
Course on multimedia (using digital video, audio equipment, etc.)	○	○

	Interested	Not interested
Participate in online communities (e.g., mailing lists, groups, blogs,k Facebook, WhatsApp, Twitter) for professional discussions with other teachers	○	○
ICT training provided by school staff	○	○
Other professional development opportunities related to ICT	○	○
Personal learning about ICT in your own time	○	○

18. Who provides the Digital Technologies/ICT Support at our school?

- ☐ A more experienced/knowledgable teacher
- ☐ School ICT Coordinator
- ☐ Other school staff
- ☐ Experts from outside the school
- ☐ School ICT Committee
- ☐ Online support

Further Supports

19. How can the Digital Technologies Committee and Management aid you in the development of your 365 skills? *

- [ ] Facilitated buddy system
- [ ] Further group training
- [ ] Links to online support
- [ ] Time made available
- [ ] Other

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Part 2 -Teacher Questionnaire on the use of Digital Technologies in Teaching and Learning

* Required

* This form will record your name, please fill your name.

Digital Technologies/ICT based activities and material used for teaching

2/25/2022

1. How often do you do the following activities? *

	Never	Rarely	Sometimes	Often	All the time
Browse/search the internet to collect information to prepare lessons	○	○	○	○	○
Browse/search the internet to collect resources to be used during lessons	○	○	○	○	○
Use applications to prepare presentations for lessons	○	○	○	○	○
Create your own digital learning materials for students	○	○	○	○	○
Prepare exercises and tasks for students	○	○	○	○	○
Post home work for students on the school website	○	○	○	○	○
Use ICT to provide feedback and/or assess students' learning	○	○	○	○	○
Evaluate digital learning resources in the subject(s) you teach	○	○	○	○	○
Communicate online with parents	○	○	○	○	○
Download/upload /browse material from a learning platform (e.g. 365 One drive)	○	○	○	○	○
Look for online professional development opportunities	○	○	○	○	○

2. Which of the following types of materials have you used when teaching your classes with the aid of a computer and/or the Internet *

	Never	Rarely	Sometimes	Often	All the time
Material that you've searched the Internet for	○	○	○	○	○
Existing online material from established educational sources	○	○	○	○	○
Material that is available on the school's computer network or database	○	○	○	○	○
Electronic offline material (e.g., CD-ROM)	○	○	○	○	○
Material of your own creation	○	○	○	○	○
Shared resources	○	○	○	○	○

Obstacles to the use of Digital Technologies/ ICT in teaching and learning

2/25/2022

3. Is the use of Digital Technologies/ ICT in teaching and learning adversely affected by the following? * *

	Not at all	A little	Partially	A lot
Insufficient number of computers	○	○	○	○
Insufficient number of internet-connected computers	○	○	○	○
Insufficient Internet bandwidth or speed	○	○	○	○
Insufficient number of interactive whiteboards	○	○	○	○
Insufficient number of laptops/notebooks	○	○	○	○
School computers out of date and/or needing repair	○	○	○	○
Lack of adequate skills of teachers	○	○	○	○
Insufficient technical support for teachers	○	○	○	○
Insufficient pedagogical support for teachers	○	○	○	○
Lack of adequate content/material for teaching	○	○	○	○
Lack of content in national language	○	○	○	○
Too difficult to integrate Digital Technologies/ICT use into the curriculum	○	○	○	○

	Not at all	A little	Partially	A lot
Lack of pedagogical models on how to use Digital Technologies/ICT for learning	○	○	○	○
School time organisation (fixed lesson time, etc.)	○	○	○	○
School space organisation (classroom size and furniture, etc)	○	○	○	○
Pressure to prepare students for exams and tests	○	○	○	○
Most parents not in favour of the use of Digital Technologies/ICT at school	○	○	○	○

4. Continued.... Is the use of Digital Technologies/ICT in teaching and learning adversely affected by the following? * *

	Not at all	A little	Partially	A lot
Most teachers not in favour of the use of Digital Technologies/ICT at school	○	○	○	○
Insufficient number of internet-connected computers	○	○	○	○
Lack of interest of teachers	○	○	○	○
No or unclear benefit of use of Digital Technologies/ICT for teaching	○	○	○	○
Using Digital Technologies/ICT in teaching and learning not being a goal of the school	○	○	○	○

5. To what extent are you confident in the following? *

	Not at all	A little	Partially	A lot
Produce a text using a word processing programme	○	○	○	○
Use emails to communicate with others	○	○	○	○
Capture and edit digital photos, movies or other images	○	○	○	○
Edit text online containing internet links and images	○	○	○	○
Create a database	○	○	○	○
Create and/or edit a questionnaire online	○	○	○	○
Organise computer files in folders and subfolders	○	○	○	○
Use a spreadsheet (e.g., Excel)	○	○	○	○
Use a spreadsheet to plot a graph	○	○	○	○
Create a presentation with simple animation functions	○	○	○	○
Create a presentation with video or audio clips	○	○	○	○
Participate in a discussion forum on the internet	○	○	○	○

	Not at all	A little	Partially	A lot
Create and maintain blogs or web sites	○	○	○	○
Participate in social networks	○	○	○	○
Download and install software on a computer	○	○	○	○
Download or upload curriculum resources from/to websites or learning platforms for students to use	○	○	○	○
Teach students how to behave safely online	○	○	○	○
Teach students how to behave ethically online	○	○	○	○
Prepare materials to use with an interactive whiteboard	○	○	○	○
Use a Student Response System (e.g., ActiVote, ActivExpression, Office 365 or other) Programming	○	○	○	○

Teacher attitudes towards the use of Digital Technologies/ICT in school

2/25/2022

6. Select the answer that represents your attitude towards the use of Digital Technologies/ICT in school

	Completely disagree	Disagree	Neutral	Agree	Completely agree
I feel comfortable with the idea of the computer as a tool in teaching and learning	○	○	○	○	○
The use of computers in teaching and learning stresses me out.	○	○	○	○	○
If something goes wrong I will not know how to fix it.	○	○	○	○	○
The idea of using a computer in teaching and learning makes me skeptical.	○	○	○	○	○
The use of the computer as a learning tool excites me	○	○	○	○	○
The use of computers in teaching and learning scares me.	○	○	○	○	○
The computer is a valuable tool for teachers.	○	○	○	○	○
The computer will change the way I teach.	○	○	○	○	○
The computer will change the way students learn in my classes.	○	○	○	○	○

	Completely disagree	Disagree	Neutral	Agree	Completely agree
I can do what the computer can do equally as well.	○	○	○	○	○
The computer is not conducive to student learning because it is not easy to use.	○	○	○	○	○
The computer helps students understand concepts in more effective ways.	○	○	○	○	○
The computer helps students learn because it allows them to express their thinking in better and different ways	○	○	○	○	○
The computer helps teachers to teach in more effective ways	○	○	○	○	○
The computer is not conducive to good teaching because it creates technical problems	○	○	○	○	○

7. Perceived self confidence in integrating Digital Technologies/ICT

	Completely disagree	Disagree	Neutral	Agree	Completely agree
I can select appropriate software to use in my teaching	○	○	○	○	○
I can use PowerPoint in my class	○	○	○	○	○
I can design technology-enhanced learning activities for my students	○	○	○	○	○
I can use email to communicate with my students	○	○	○	○	○
I can teach my students to select appropriate software to use in their projects	○	○	○	○	○
I can teach my students how to make their own web pages	○	○	○	○	○
I can use the Internet in my lessons to meet certain learning goals	○	○	○	○	○
The computer can help students understand concepts more easily	○	○	○	○	○

8. With reference to your subject below, select how you integrate Digital Technologies into your teaching and learning?

	Never	Once or twice a year	Monthly	Weekly	Daily	A few times a day	Almost every class
Internet	○	○	○	○	○	○	○
Word processing (e.g., Word)	○	○	○	○	○	○	○
Spreadsheets (e.g., Excel)	○	○	○	○	○	○	○
Databases (e.g., Access)	○	○	○	○	○	○	○
Presentation software (e.g., PowerPoint)	○	○	○	○	○	○	○
Website development	○	○	○	○	○	○	○
Simulations (e.g., Interactive Physics) Modeling (e.g., Model-It)	○	○	○	○	○	○	○
Concept mapping (e.g., Kidspiration, Inspiration)	○	○	○	○	○	○	○
Collaboration software e.g. Teams	○	○	○	○	○	○	○
Educational CDs	○	○	○	○	○	○	○
Resource sharing - One drive	○	○	○	○	○	○	○
Communication - Outlook	○	○	○	○	○	○	○

Edit this form

Teacher Questionnaire on the use of Information and Communication Technology (ICT)

AGRUPAMENTO DE ESCOLAS DE ATOUGUIA DA BALEIA - PORTUGAL

Your school is participating in the Erasmus+ Programme: "21st Century European Classroom: meeting the challenge of the digital era with innovation and creativity".

This questionnaire is about Digital Literacy and use of ICT by teachers in each school partner (mainly focused on the frequency, quality and diversity of ICT use in teaching and learning).

Read and answer each question carefully and ask for help if you do not understand something or are not sure how to respond. Answering this questionnaire should require you about 15 minutes.

All responses are anonymous and are treated in strict confidence.

Thank you very much for your collaboration. Your input is really important for our study.

*Required

Personal background information

1. Age: *

- from 40 to 49
- 50 or more

2. Gender: *

- Female
- Male

3. Subject(s)/Area: *

- Arts
- Mathematics
- Music Education
- Physical Education
- Science
- Languages
- Social Studies/Humanities
- Technology
- Special needs
- Other

4. Average number of students per class: *

- fewer than 10
- 10-15
- 16-20
- 21-25
- more than 25

5. Teaching hours per week: *

- fewer than 10
- 10-15 hours
- 16-20 hours
- 21-25 hours
- more than 25 hours

6. Including this school year, how long have you been teaching (at any school)? *

- Less than 1 year
- 1-3 years
- 4-10 years
- 11-20 years
- 21-30 years
- More than 30 years

7. How is ICT taught to classes in your school? *

	yes	no
ICT is taught as a separate subject	○	○
ICT is integrated in my subject because I choose to do so	○	○
ICT is integrated in my subject because of curriculum requirements	○	○
ICT is integrated in several subjects	○	○

Experience with ICT for teaching

8. Do you use computers and/or the internet for the following activities? *

	yes	no
Preparing lessons	○	○
Class teaching in front of/with the students	○	○

[If the answer to both items or at least the second one is 'NO', go to question 21]

9. For how many years have you been using computers and/or the internet at any school?

- ○ Less than 1 year
- ○ Between 1 to 3 years
- ○ Between 4 to 6 years
- ○ More than 6 years

10. How often do you use computers and/or the internet in your classes?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Often
- ○ All the time

ICT access for teaching

11 . When you use computers and/or Internet during class teaching in front of the students, which equipment is available?

	never	rarely	sometimes	often	all the time
Students are equipped with computers and/or Internet	●	●	●	●	●
Only the teacher uses a computer and/or Internet	●	●	●	●	●
Both, teacher and students, use computers and/or Internet	●	●	●	●	●

12. Which conditions do you have access in your classes?

	yes	no
Desktop computer without internet access	●	●
Desktop computer with internet access	●	●
Non-internet-connected laptop, tablet PC, netbook or notebook computer	●	●
Internet-connected laptop, tablet PC, netbook or notebook computer	●	●
E-reader (a device to read books and newspapers on screen)	●	●
Mobile phone provided by the school	●	●
Interactive whiteboard	●	●
Digital camera or camcorder	●	●
Computer laboratory	●	●
Student response system (e.g., ActiVote, ActivExpression or other)	●	●

13. Does your school provide teachers with laptops (or tablet PC, desktop computers, netbooks, notebooks) for their own use?

- ● yes
- ● no

14. Does your school provide students with laptops (or tablet PC, desktop computers, netbooks, notebooks) for their own use?

- no

15. Are the students allowed to use the personally owned devices listed below at school for learning?

	yes	no
Laptop, tablet, netbook, notebook		
Mobile or Smartphone		

Support to teachers for ICT use

16. Is participation in ICT training compulsory for teachers in your school?

- yes
- no

17. Have you ever undertaken professional development in the following areas?

	yes	no
Introductory courses on internet use and general applications (basic word-processing, spreadsheets, presentations, databases, etc.		
Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment, etc.)		
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)		
Equipment-specific training (interactive whiteboard, laptop, tablet, etc.)		
Courses on the pedagogical use of ICT in teaching and learning		
Subject-specific training on learning applications (tutorials, simulations, etc.)		
Course on multimedia (using digital video, audio equipment, etc.)		
Participate in online communities (e.g., mailing lists, groups, blogs) for professional discussions with other teachers		
ICT training provided by school staff Personal learning about ICT in your own time		

18. Who provides the ICT support at your school?

You can choose one or more options.

- ☐ A more experienced / knowledgeable teacher
- ☐ School ICT / technology coordinator
- ☐ Other school staff
- ☐ Experts from outside the school
- ☐ An online helpdesk, community or website

ICT based activities and material used for teaching

19. How often do you do the following activities?

	Never	Rarely	Sometimes	Often	All the time
Browse/search the internet to collect information to prepare lessons	○	○	○	○	○
Browse/search the internet to collect resources to be used during lessons	○	○	○	○	○
Use applications to prepare presentations for lessons	○	○	○	○	○
Create your own digital learning materials for students	○	○	○	○	○
Prepare exercises and tasks for students	○	○	○	○	○
Post home work for students on the school website	○	○	○	○	○
Use ICT to provide feedback and/or assess students' learning	○	○	○	○	○
Evaluate digital learning resources in the subject(s) you teach	○	○	○	○	○
Communicate online with parents	○	○	○	○	○
Download/upload/browse material from the school's website	○	○	○	○	○
Download/upload/browse material from a learning platform	○	○	○	○	○
Look for online professional development opportunities	○	○	○	○	○

20. Which of the following types of materials have you used when teaching your classes with the aid of a computer and/or the Internet?

	yes	no
Material that you've searched the Internet for	●	●
Existing online material from established educational sources	●	●
Material that is available on the school's computer network or database	●	●
Electronic offline material (e.g., CD-ROM)	●	●
Material of your own creation	●	●

Obstacles to the use of ICT in teaching and learning

21. Is the use of ICT in teaching and learning adversely affected by the following? *

	Not at all	A little	Partially	A lot
Insufficient number of computers	●	●	●	●
Insufficient number of internet-connected computers	●	●	●	●
Insufficient Internet bandwidth or speed	●	●	●	●
Insufficient number of interactive whiteboards	●	●	●	●
Insufficient number of laptops/notebooks	●	●	●	●
School computers out of date and/or needing repair	●	●	●	●
Lack of adequate skills of teachers	●	●	●	●
Insufficient technical support for teachers	●	●	●	●
Insufficient pedagogical support for teachers	●	●	●	●
Lack of adequate content/material for teaching	●	●	●	●
Lack of content in	●	●	●	●

integrate ICT use into the curriculum				
Lack of pedagogical models on how to use ICT for learning				
School time organisation (fixed lesson time, etc.)				
School space organisation (classroom size and furniture, etc)				
Pressure to prepare students for exams and tests				
Most parents not in favour of the use of ICT at school				
Most teachers not in favour of the use of ICT at school				
Lack of interest of teachers				
No or unclear benefit to use ICT for teaching				
Using ICT in teaching and learning not being a goal in our school				

Teachers skills

22. To what extent are you confident in the following?*

	None	A little	Somewhat	A lot
Produce a text using a word processing programme				
Use emails to communicate with others				
Capture and edit digital photos, movies or other images				
Edit text online containing internet links and images				
Create a database				
Create and/or edit a				

someone				
Organise computer files in folders and subfolders				
Use a spreadsheet (e.g., Excel)				
Use a spreadsheet to plot a graph				
Create a presentation with simple animation functions				
Create a presentation with video or audio clips				
Participate in a discussion forum on the internet				
Create and maintain blogs or web sites				
Participate in social networks				
Download and install software on a computer				
Download or upload curriculum resources from/to websites or learning platforms for students to use				
Teach students how to behave safely online				
Teach students how to behave ethically online				
Prepare materials to use with an interactive whiteboard				
Use a Student Response System (e.g., ActiVote, ActivExpression or other)				
Programming				

ICT in school management

23. Does your school provide an email address: *

To teachers?	○	○
To students?	○	○
To other staff?	○	○

24. Do you use any Electronic Register System in your school? *

- ○ yes
- ○ no
- ○ I don't know

25. Do you use any Learning Management System (LMS) in your school? *

- ○ yes
- ○ no
- ○ I don't know

26. Do you use any Content Management System (CMS) in your school? *

- ○ yes
- ○ no
- ○ I don't know

Thank you for completing this questionnaire.

Submit

Powered by

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Report Abuse - Terms of Service - Additional Terms

Dear Colleagues,

Further to our letter on March 20th we have decided to ask you to complete this evaluation survey.

No one knows what will happen after Easter but for now we need to plan for school closures to continue.

We realise that you all have worked very hard supporting students online. It is important that we are fully informed of what your experience has been before we plan for April/May.

We would like know if we can support you in any way in your efforts to sustain student learning.

We hope to have a Year Head online meeting on Thursday morning.

If you could complete the survey before then it would really inform us and our planning.

Stay safe

Fergus and Maureen

Letter sent to Staff - 20th March 2020

Dear Colleagues

Firstly, we want to thank you for the work you have done with pupils to date, operating in extraordinary times.

We have been checking in with some of you over the past few days and feel that now is a good time to take stock.

We agreed at our staff meeting that we would provide a schedule of work, which students could work on and submit on their return from school. For the past week we have worked very hard to set students up for the with high quality study plans. We are all following a set plan. *We want to reiterate that there is no expectation whatsoever that you need to do anything beyond this – especially with non-examination classes.*

It was agreed that you work with students according to your technical ability and circumstances. However, we worry that some of you might feel under pressure. We want to alleviate that. We are strong believers in Office 365, but colleagues are reporting that the Teams function is proving to be time consuming for some of you. We are delighted with the support it gives to students. LC parents in particular are very appreciative. If you are working one-on –one with a pupil, that's great, but remember you are extending yourself beyond our original agreement and you need to ensure its not at the cost of your personal wellbeing. Being out of the workspace means that we do not have a level pitch. Some of you are have the time, space and infrastructure, some do not. We will remind parents of this.

The ICT Committee are extremely busy trying to sort a myriad of problems. We thank them again- and we do not take them for granted.

Our students are also experiencing extraordinary times. They have to cope with a new normal. They have a range of issues, some of which we may not be aware. For many, their only contact is through their phone. Some have no broadband at all. We have provided them with detailed plans for now and it is up to students and their parents to follow these plans. This is a time for students to focus on their learning. We have contacted a number of parents. Some have just lost their job. LC parents are particularly supportive and are trying their best. They report that the virtual classroom is no replacement for the real version. Some are struggling to motivate their child. All were grateful.

We are proposing that we extend the study plans for students for one more week and then we can see how thing are towards the end of Easter. We have to realise our lives will change incrementally next week and the immediate future. Some of us may have significant personal challenges to meet. Each staff member has loved ones that they are worried about and caring for and we will support each other in the days ahead.

We have to mind ourselves and protect the wonderful spirit that exists within the staff of Colaiste Muire. .

Keep safe

Fergus and Maureen.

1.
What year groups are you supporting through ICT?

☐**1st Yr**

☐**2nd Yr**

☐**3rd Yr**

☐**TY**

☐**5th Yr**

☐**6th Yr**

[Ok]

2.
How are you providing this support?

☐**I have uploaded a study plan**

☐**I have set work using teams**

☐**I have communicated with students via teams**

☐**I have uploaded assignments with no set date for submission**

☐**I have uploaded assignments with specified submission date**

☐**Students have submitted assignments to me which I have corrected and returned**

☐**I have used online video to deliver online teaching**

☐**I have verbally communicated with students using apps such as Zoom**

☐**Other**

[Ok]

3.
I would need help to use ICT to undertake the following
Let us know if you would like further support on any of the following

☐**Upload a study plan**

☐**Set work using teams**

☐**Communicate with students via teams**

☐**Upload assignments**

☐**Mark assignments and return to student**

☐**Use online video to deliver online teaching**

☐**I have verbally communicated with students using apps such as Zoom**

☐**Additional**

[Ok]

4.
Prior to the closure of school due to Covid 19 how would you have rated you ability to undertake online learning support?
0 = no idea of how I would carry out online learning support. 5 = Fully confident in my ability to comprehensively support learning online.

0	1	2	3	4	5
○	○	○	○	○	○

[Ok]

5.
Since closure of school due to Covid 19 how would you now rate you ability to undertake online learning support?
0 = no idea of how I would carry out online learning support. 5 = Fully confident in my ability to comprehensively support learning online.

0	1	2	3	4	5
○	○	○	○	○	○

[Ok]

6.
Have you relied on any of the following to support you in adapting to providing online learning support?

	Yes	No
	1	2
I rely on self-directed learning	○	○
I draw on my experience to try to improve my ICT skills to support online learning	○	○
Has this school closure prompted your readiness to learn more about using ICT in your teaching?	○	○
Has the need to try and support online learning provided motivation for you to increase your knowledge of ICT to support learning	○	○

[Ok]

7.
How effective have Office 365 tools been in delivering online support
Move the slider to respond

Min

Max

5

[Ok]

8.
Any further comments you would like to make on the effectiveness of Office 365

[Ok]

9.
What challenges have you encountered in engaging in online learning support?

[Ok]

10.
What positive outcomes have you encountered since engaging in online learning support?

[Ok]

11.
How do you think we should plan delivering further online support should the school closure continues after Easter?

[Ok]

12.
What are your thoughts about how we should plan further online delivery should the schools remain closed after Easter?

[Ok]

13.
On a scale of 1 to 10 (1 = 10% 10=100%) what percentage of your 1st year students are engaging with you in online learning?
Move the slider to respond

Min

Max

1

☒**NA (Not Applicable)**

[Ok]

14.
On a scale of 1 to 10 (1 = 10% 10=100%) what percentage of your 2nd year students are engaging with you in online learning?
Move the slider to respond

Min

Max

1

☒**NA (Not Applicable)**

[Ok]

15.

On a scale of 1 to 10 (1 = 10% 10=100%) what percentage of your 3rd year students are engaging with you in online learning?
Move the slider to respond

Min

Max

1

☒**NA (Not Applicable)**

[Ok]

16.
On a scale of 1 to 10 (1 = 10% 10=100%) what percentage of your 4th year students are engaging with you in online learning?
Move the slider to respond

Min

Max

1

☒**NA (Not Applicable)**

[Ok]

17.
On a scale of 1 to 10 (1 = 10% 10=100%) what percentage of your 5th year students are engaging with you in online learning?
Move the slider to respond

Min

Max

1

☒**NA (Not Applicable)**

[Ok]

18.
On a scale of 1 to 10 (1 = 10% 10=100%) what percentage of your 6th year students are engaging with you in online learning?
Move the slider to respond

Min

Max

1

☒**NA (Not Applicable)**

[Ok]

19.
What suggestions do you have in addressing issues with students not engaging?

[Ok]

20.
How are you coping personally with self isolating and efforts to continue supporting students online?

[Ok]

21.
Please let us know if you have additional comments or suggestions to make?

[Ok]

Student Experience of Online Learning during Covid 19

Dear Students, we have all experienced big changes in teaching and learning since school closed due to Covid 19. I hope this survey finds you all well and staying safe. As this has been such an unprecedented time we would like to learn about your experiences of teaching and learning during this time. We have carried out a similar survey with our teachers to learn from their experience of teaching and learning during this time. Participation in this survey is purely voluntary. We would hope that we could learn from your experience so that we can focus improving future online learning experiences.
Thanks
Mrs Kenneally

* Required

* This form will record your name, please fill your name.

1. So far how would you rate your experience of online teaching and learning during the Covid 19 school shut down? *

☆ ☆ ☆ ☆ ☆

2/25/2022

2. Why did you choose this rating? *

3. How would you rate your participation in online teaching and learning during the Covid 19 school shut down? *

☆ ☆ ☆ ☆ ☆

4. Why did you choose this ranking? *

2/25/2022

5. Select from the options below which best describes your participation with the following aspects of online teaching and learning? *

	Multiple times during the day	Once a day	Twice a week	Once a week	Once a fortnight	Rarely	Never
Use of Study plans	○	○	○	○	○	○	○
Learning through participation in Teams with Teachers	○	○	○	○	○	○	○
Doing assignments and uploading them for correction	○	○	○	○	○	○	○
Sharing resources with fellow students online	○	○	○	○	○	○	○
Learning new aspects of my subjects	○	○	○	○	○	○	○

6. What has your experience been of online teaching during this time? *

7. What has your experience been of online learning during this time? *

8. What has your experience been of online assessment during this time? (assignments or tests that you have submitted and teacher has returned to you) *

9. What has been the best aspect for you of online teaching and learning in our first month? *

10. What has been the worst aspect of online teaching and learning in our first month? *

11. What could the school do that would improve your experience of online teaching and learning? *

12. If school was to open tomorrow, which number best describes how you would feel? *

0	1	2	3	4	5	6	7	8	9	10

Very unhappy Very happy

13. What is the reason for your score? *

14. Additional comments regarding online teaching and learning during Covid 19

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.

Microsoft Forms

Feedback from CBA OneNote Training Sessions

Mr D Walsh <dwalsh@colaistemuire.com>
Fri 28/02/2020 12:26
To: Maureen Kenneally <mkenneally@colaistemuire.com>

Initial Training:

- All participants seemed to see the value in using OneNote for recording, etc and that it would reduce workload. This was quite likely due to seeing an example of it working in practice (Louise)
- All participants seemed engaged
- Training was easy enough to deliver, however did need significant forethought and planning, I wouldn't do it off the cuff
- The use of the instruction sheet helped, although many of the participants then started to move ahead independently which confused matters a little
- Having it in the Computer Room was good but it needed both Conor and I facilitating, even with such a small group
- There was an issue with sharepoints not creating fast enough once a departmental team had been set up
- To improve/do when repeating the training:
    - Whoever is doing it needs to really familiarise themselves and plan it well
    - Ask to have a departmental team created before the training starts
    - You do need two people doing the training
    - It needs to be done step by step
    - Have a sample at the start / testimonial for buy-in
    - They need to have located and read the CBA guidelines first including features of quality
    - *NB: Suggest an "Instructions Page"*

Collaboration Session

- Lots of collaboration going on
- Was good to let them off and do it themselves but does need the bit of facilitation for technical questions
- Again, good buy in
- Some issues resulted from a lack of buy in to CBAs as opposed to OneNote which did slow things down a little
- Excellent collaboration resulted in the suggestion of a new "Instructions Page" in the OneNote
- When repeating the session
    - Maybe be a little firmer setting targets
    - Remind them that this isn't a discussion about the value of CBAs
    - Room 19 worked perfectly

Hope this is all OK?

Daniel

Feedback on session 1

Mr.Uhl <cuhl@colaistemuire.com>
Sun 01/03/2020 11:29
To: Maureen Kenneally <mkenneally@colaistemuire.com>

Having carried out the first training session with the maths and geography departments we could come to the following conclusions:

Developing a CBA collaborative assessment & recording method is something the two departments are very happy with. Having demonstrated the proposed layout within OneNote, the two groups of teachers could clearly see the advantages of such a layout and therefore appeared very interested in working on creating templates within their subject departments.

Storing student work , assessing student work and communicating formative feedback back to the student in one paperless platform was acknowledged by all as a very positive way to structure the CBAs.

The two groups also commented on the interdepartmental consistency of correcting as being a massive plus.

SLAR meeting would also become a much easier process using the proposed OneNote method.

To conclude, as one of the ICT committee trainers I would have to say the first session was a success. What we set out to achieve was to convince the two departments that Digital technology in the form of OneNote could make the CBA process a whole lot easier. Judging by the reaction and engagement by all I would have to say the we achieved what we had set out.

Regards Conor

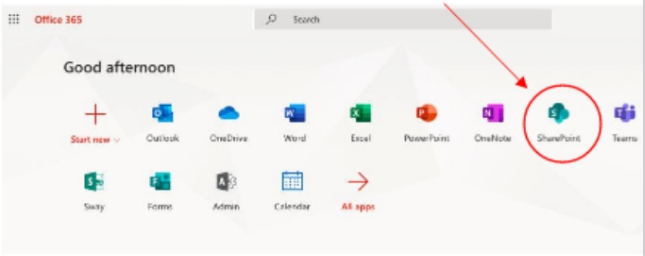
Get Outlook for iOS

Appendix I: OneNote Help Sheet

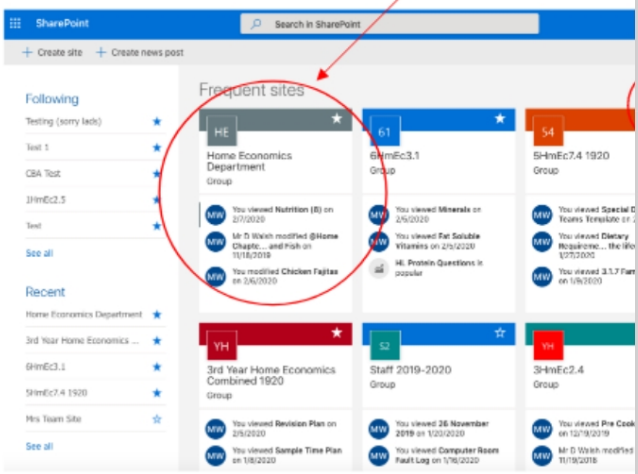
CBA record keeping.pdf Print Save to OneDrive

Section 1 – Creating the Template Notebook for Department	
Step 1:	Create a team for your department / CBA group. Name the group e.g. Home
Step 2:	Create a template notebook in your Sharepoint

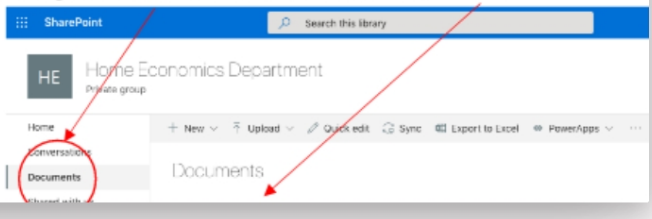
1. Log onto www.office.com and click on "Sharepoint"



2. Navigate to the name of the team that you have just set up. You may ne top right-hand corner to do this



3. Navigate to documents and create a folder called "CBAs"



INFORMATION AND CONSENT FORM
Focus Group Volunteer

Information Sheet

Purpose of the study
I am Maureen Kenneally, a Doctorate of Education student in Maynooth University. As part of my course I am undertaking an Action Research study to look at "How we can improve the use of ICT by teachers In their teaching?"

What will the study involve?
The study will involve the ICT committee, teaching staff and myself as lead researcher and member of the ICT committee, collaborating in Action Research with the aim of achieving improved use of ICT in teaching in our school.

This study will require data collection in two forms.

Firstly, teachers will be invited to complete an online survey to gain information on their current use of ICT in their classrooms. It will also aim to determine how they can be supported to improve their use of ICT in teaching.

Secondly, data collection will involve focus group interviews. With the voluntary participation of a small number of the teaching staff a focus group will be formed. This is the group you are now considering to volunteer for. I will organize one interview session where I will be joined by representatives from the ICT committee, to meet with the focus group volunteers to discuss data collected from the survey. Through this discussion and questioning we hope to gather more comprehensive data set. The focus group session will also provide volunteers, the teacher representatives with an opportunity discuss and relay further data relevant to the project aim. The aim of both data collection methods is to gather as much data as possible so that we can correctly identify where issues are and how they may be overcome.

These focus group interviews will be digitally recorded so that we, the ICT committee can review the interviews in our collaboration on what action to take to address problems raised. No volunteer on of the focus group will have their identity made known in the write up of this project. All digital recordings will be securely stored by me and will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

Who has approved this study?
This study has been reviewed and received ethical approval from Maynooth University Ethics Committee and the Education Doctoral Research Committee. You may have a copy of this approval if you request it.

Why have you been asked to take part?
You have been asked to take part in this study because the focus of this research is on improving the use of ICT in teaching, by our teachers in our school, of which you are a member.

Do you have to take part?
No, you are under no obligation to take part. I hope you will agree to participate but it is your choice, there is no onus on any member of staff to join the research community and no offence will be taken if you decide not to participate. If you do decide to take part, you will begin by completing the online survey so that we can gather data on your experience and use of ICT in your teaching. Following this you will be offered the opportunity of participating in a focus group interview.

If you decide to take part, you are free to withdraw at any stage without giving any reason. You are also free to withdraw your information up until such a time as the research findings are reported.

What information will be collected?
The information that will be collected will include your name on the consent form. Both the survey and focus group interview will collect data of your experience and reflections of your use of ICT in your teaching.

Will participation in the study be kept confidential?
Yes, all information that is collected about you during the course of the research will be kept confidential. All hard copies will be locked in a secure cabinet at the researchers' home. Electronic information will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

'It must be recognised that, in some circumstances, confidentiality of research data and records may be overridden by courts in the event of litigation or in the course of investigation by lawful authority. In such circumstances the University will take all reasonable steps within law to ensure that confidentiality is maintained to the greatest possible extent.'

No information will be distributed to any other unauthorised individual or third party. If you wish, a copy of the data you provide can also be made available to you.

What will happen to the information which you give?
All the information you provide will be kept at Maynooth University in such a way that it will not be possible to identify you. Electronic data will be encrypted, and hard copies of the data will be kept in a secure cabinet. On completion of the research, the data will be retained on the MU server. After ten years, all data will be destroyed. Manual data will be shredded confidentially by me and electronic data will be reformatted or overwritten by me in Maynooth University.

What will happen to the results?
The research will be written up and presented as a thesis. It may also be presented at National Conferences and/or written and presented for publication. A copy of the research findings will be made available to you upon request.

What are the possible disadvantages of taking part?
I do not envisage any possible disadvantage to you taking part in this research study. If you feel that the research has not been carried out as described above, you may contact my supervisor, Dr. Anthony Malone,
Phone: 01-7083760,
Email: anthony.malone@mu.ie

Any further queries?
If you require any further information you may contact me,
Maureen Kenneally
Phone : 087-2903548
Email: maureen.kenneally.2018@mumail.ie

If you agree to take part in the study, please complete and sign the consent form overleaf.

Thank you for taking the time to read this.

Consent Form

I……agree to participate in Maureen Kenneally's Action Research study titled. "How can we improve the use of ICT in teaching in our school?"

Please tick each statement below:

The purpose and nature of the study has been explained to me in writing. I've been able to ask questions, which were answered satisfactorily. ☐

I am participating voluntarily. ☐

I agree to participate in an online survey followed by focus group interviews. ☐

I understand that I can withdraw from the study, without repercussions, at any time, whether that is before it starts or while I am participating. ☐

I understand that I can withdraw permission to use the data right up to data reporting. ☐

It has been explained to me how my data will be managed and that I may access it on request. ☐

I understand the limits of confidentiality as described in the information sheet. ☐

I understand that my data, in an anonymous format may presented at National Conferences and in any subsequent publications if I give permission: ☐

I agree to quotation/publication of extracts from my assignment. ☐
I do not agree to quotation/publication of extracts from my assignment. ☐

I agree to quotation/publication of extracts from my interview. ☐
I do not agree to quotation/publication of extracts from my interview. ☐

Signed: _____ Date: _____

Participant Name in block capitals: _____

I the undersigned have taken the time to fully explain to the above participant the nature and purpose of this study in a manner that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Signed…… Date……..

Researcher Name in block capitals ……..

If during your participation in this study you feel the information and guidelines that you were given have been neglected or disregarded in any way, or if you are unhappy about the process, please contact the Secretary of the Maynooth University Ethics Committee at research.ethics@mu.ie or +353 (0)1 708 6019. Please be assured that your concerns will be dealt with in a sensitive manner.

For your information the Data Controller for this research project is Maynooth University, Maynooth, Co. Kildare. Maynooth University Data Protection officer is Ann McKeon in Humanity house, room 17, who can be contacted at ann.mckeon@mu.ie. Maynooth University Data Privacy policies can be found at https://www.maynoothuniversity.ie/data-protection.

Two copies to be made: 1 for participant, 1 for researcher

INFORMATION AND CONSENT FORM
Board of Management

Information Sheet

Purpose of the study
I am Maureen Kenneally, a Doctorate of Education student in Maynooth University. As part of my course I am undertaking an Action Research study to look at "How we can improve the use of ICT by teachers In their teaching?"

What will the study involve?
The study will involve the a newly formed ICT committee named the Voluntary ICT committee, which may have some, all or none of the current ICT committee members, volunteers from our teaching staff and myself as lead researcher and member of the VICT committee, collaborating in Action Research with the aim of achieving improved use of ICT in teaching in our school.

This study will require data collection in two forms.

Firstly, teachers will be invited to complete an anonymous online survey to gain information on their current use of ICT in their classrooms. The link will be emailed to the general staff email address. The link will remain active for one week so that staff who wish to participate in the survey will have time to do so. This survey aims to collect data that helps to determine how teachers can be supported, should they wish to, to improve their use of ICT in teaching.

Secondly, data collection will involve focus group interviews. With the voluntary participation of a small number of teaching staff a focus group will be formed. I will organize one interview session where I will be joined by representatives from the ICT committee, to meet with the focus group volunteers to discuss data collected from the survey. Through this discussion and questioning we hope to gather more comprehensive data set. The focus group session will also provide volunteers as teacher representatives with an opportunity discuss and relay further data relevant to the project aim. The aim of both data collection methods is to gather as much data as possible so that we can correctly identify where issues are and how they may be overcome.

These focus group interviews will be digitally recorded, by my digital recording device, so that we, the ICT committee can review the interviews in our collaboration on what action to take to address problems raised. No volunteer on of the focus group will have their identity made known in the write up of this project. All digital recordings will be securely stored by me and will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

Who has approved this study?
This study has been reviewed and received ethical approval from Maynooth University Ethics Committee and the Education Doctoral Research Committee. You may have a copy of this approval if you request it.

Why are our teachers being asked to take part?
Teachers have been asked to take part in this study because the focus of this research is on improving the use of ICT in teaching, by our teachers in our school

Do teachers have to take part?
No, teachers are under no obligation to take part. I hope they will agree to participate but it is their choice, there is no onus on any member of staff to join the research community and no offence will be taken if they decide not to participate. If they do decide to take part, they will begin by completing the online survey so that we can gather data on their experience and use of ICT in teaching in our school. Following this they will be offered the opportunity of participating in a focus group interview.

If they decide to take part, they are free to withdraw at any stage without giving any reason. Volunteers are also free to withdraw your information up until such a time as the research findings are reported.

What information will be collected?
The information that will be collected will include a teacher's name on the consent form. Both the survey and focus group interview will collect data of teacher's experience and reflections of on the use of ICT in their teaching.

Will participation in the study be kept confidential?
Yes, all information that is collected about teachers during the course of the research will be kept confidential. All hard copies will be locked in a secure cabinet at the researchers' home. Electronic information will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

'It must be recognised that, in some circumstances, confidentiality of research data and records may be overridden by courts in the event of litigation or in the course of investigation by lawful authority. In such circumstances the University will take all reasonable steps within law to ensure that confidentiality is maintained to the greatest possible extent.'

No information will be distributed to any other unauthorised individual or third party. If volunteers wish, a copy of the data they provide can be made available to them.

What will happen to the information teachers give?
All the information teachers provide will be kept at Maynooth University in such a way that it will not be possible to identify them. Electronic data will be encrypted, and hard copies of the data will be kept in a secure cabinet. On completion of the research, the data will be retained on the MU server. After ten years, all data will be destroyed. Manual data will be shredded confidentially by me and electronic data will be reformatted or overwritten by me in Maynooth University.

What will happen to the results?
The research will be written up and presented as a thesis. It may also be presented at National Conferences and/or written and presented for publication. A copy of the research findings will be made available to upon request.

What are the possible disadvantages of taking part?
I do not envisage any possible disadvantage to teachers taking part in this research study. If any teachers feel that the research has not been carried out as described above, you may contact my supervisor, Dr. Anthony Malone,
Phone: 01-7083760,
Email: anthony.malone@mu.ie

Any further queries?
If you require any further information please contact me,
Maureen Kenneally
Phone : 087-2903548
Email: maureen.kenneally.2018@mumail.ie

Teachers who agree to take part in the study, will be asked to complete and sign the consent form overleaf.

Thank you for taking the time to read this.

Consent Form

I……agree to participate in Maureen Kenneally's Action Research study titled. "How can we improve the use of ICT in teaching in our school?"

Please tick each statement below:

The purpose and nature of the study has been explained to me in writing. I've been able to ask questions, which were answered satisfactorily. ☐

I am participating voluntarily. ☐

I agree to participate in an online survey followed by focus group interviews. ☐

University Data Privacy policies can be found at https://www.maynoothuniversity.ie/data-protection.

Two copies to be made: 1 for participant, 1 for researcher

I understand that I can withdraw from the study, without repercussions, at any time, whether that is before it starts or while I am participating. ☐

I understand that I can withdraw permission to use the data right up to data reporting. ☐

It has been explained to me how my data will be managed and that I may access it on request. ☐

I understand the limits of confidentiality as described in the information sheet. ☐

I understand that my data, in an anonymous format may presented at National Conferences and in any subsequent publications if I give permission: ☐

I agree to quotation/publication of extracts from my assignment. ☐
I do not agree to quotation/publication of extracts from my assignment. ☐

I agree to quotation/publication of extracts from my interview. ☐
I do not agree to quotation/publication of extracts from my interview. ☐

Signed: _____ Date: _____

Participant Name in block capitals: _____

I the undersigned have taken the time to fully explain to the above participant the nature and purpose of this study in a manner that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Signed…… Date…….

Researcher Name in block capitals ……..

If during your participation in this study you feel the information and guidelines that you were given have been neglected or disregarded in any way, or if you are unhappy about the process, please contact the Secretary of the Maynooth University Ethics Committee at research.ethics@mu.ie or +353 (0)1 708 6019. Please be assured that your concerns will be dealt with in a sensitive manner.

For your information the Data Controller for this research project is Maynooth University, Maynooth, Co. Kildare. Maynooth University Data Protection officer is Ann McKeon in Humanity house, room 17, who can be contacted at ann.mckeon@mu.ie. Maynooth

INFORMATION AND CONSENT FORM
CARC

Information Sheet

Purpose of the study
I Maureen Kenneally, am a Doctorate of Education student in Maynooth University. As part of my course I am undertaking an Action Research study to look at "How we can improve the use of ICT by teachers in their teaching?"

What will the study involve?
The study will involve volunteers from the staff ICT Committee, teaching staff and myself as lead researcher (also a member of the CARC) collaborating in Action Research with the aim of achieving improved use of ICT in teaching in our school.

This study will require data collection in two forms.

Firstly, CARC will work with me in considering our data collection methods. I propose that we collect data in two ways, online survey and validation focus group interviews. The CARC will collaborate in drawing up an online staff survey. We will then invite teachers to complete the survey on their current use of ICT in their classrooms and how they can be supported to improve their use of ICT in teaching.

Secondly, data collection will involve validation focus group interviews. Representatives from the CARC (including myself) will carry out validation focus group interviews with a voluntary group of teachers from the staff. The selection of these representatives will depend on availability on the chosen date. I will invite teachers to volunteer to form the validation focus group. Through the validation focus group interviews the CARC will hope to add to the online survey data set. The results of the online survey will provide a framework for carrying out the focus interviews. All members present from the CARC will work together in carrying out the interviews.

These validation focus group interviews will be digitally recorded so that we, the CARC can review responses in our collaboration on what action to take to address problems raised. No volunteer on of the validation focus group will have their identity made known in the write up of this project. All digital recordings will be securely stored by me and will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

Who has approved this study?
This study has been reviewed and received ethical approval from Maynooth University Ethics Committee and the Education Doctoral Research Committee. You may have a copy of this approval if you request it.

Why have you been asked to take part?
You have been asked to take part in this study because, as a member of the school ICT Committee, you have been to the forefront of addressing ICT integration in teaching and

learning. This links directly with the focus of this research on improving the use of ICT in teaching and learning in our school.

Do you have to take part?
No, you are under no obligation to take part. I hope you will agree to participate but it is your choice, there is no onus on any member of staff to join the research community and no offence will be taken if you decide not to participate. As this research will be carried out over a number of stages please feel free to withdraw from the process at any stage without giving any reason. You are also free to withdraw your information up until such a time as the research findings are reported.

What information will be collected?
The information that will be collected will include your name on the consent form. As teachers I would invite you to complete the online survey which will provide data of your experience and reflections of your use of ICT in your teaching.

Will participation in the study be kept confidential?
Yes, all information that is collected about you during the course of the research will be kept confidential. All hard copies will be locked in a secure cabinet at the researchers' home. Electronic information will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

'It must be recognised that, in some circumstances, confidentiality of research data and records may be overridden by courts in the event of litigation or in the course of investigation by lawful authority. In such circumstances the University will take all reasonable steps within law to ensure that confidentiality is maintained to the greatest possible extent.'

No information will be distributed to any other unauthorised individual or third party. If you wish, a copy of the data you provide can also be made available to you.

What will happen to the information which you give?
All the information you provide will be kept at Maynooth University in such a way that it will not be possible to identify you. Electronic data will be encrypted, and hard copies of the data will be kept in a secure cabinet. On completion of the research, the data will be retained on the MU server. After ten years, all data will be destroyed. Manual data will be shredded confidentially by me and electronic data will be reformatted or overwritten by me in Maynooth University.

What will happen to the results?
The research will be written up and presented as a thesis. It may also be presented at National Conferences and/or written and presented for publication. A copy of the research findings will be made available to you upon request.

What are the possible disadvantages of taking part?
I do not envisage any possible disadvantage to you taking part in this research study. If you feel that the research has not been carried out as described above, you may contact my supervisor, Dr. Anthony Malone,
Phone: 01-7083760,
Email: anthony.malone@mu.ie

Any further queries?
If you require any further information you may contact me,
Maureen Kenneally
Phone : 087-2903548
Email: maureen.kenneally.2018@mumail.ie

If you agree to take part in the study, please complete and sign the consent form overleaf.

Thank you for taking the time to read this.

Consent Form

I……agree to participate in Maureen Kenneally's Action Research study titled. "How can we improve the use of ICT in teaching in our school?"

Please tick each statement below:

The purpose and nature of the study has been explained to me in writing. I've been able to ask questions, which were answered satisfactorily. ☐

I am participating voluntarily. ☐

I agree to participate in an online survey followed by validation focus group interviews. ☐

I understand that I can withdraw from the study, without repercussions, at any time, whether that is before it starts or while I am participating. ☐

I understand that I can withdraw permission to use the data right up to data reporting. ☐

It has been explained to me how my data will be managed and that I may access it on request. ☐

I understand the limits of confidentiality as described in the information sheet. ☐

I understand that my data, in an anonymous format may presented at National Conferences and in any subsequent publications if I give permission: ☐

I agree to quotation/publication of extracts from my assignment. ☐
I do not agree to quotation/publication of extracts from my assignment. ☐

I agree to quotation/publication of extracts from my interview. ☐
I do not agree to quotation/publication of extracts from my interview. ☐

Signed: _____ Date: _____

Participant Name in block capitals: _____

I the undersigned have taken the time to fully explain to the above participant the nature and purpose of this study in a manner that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Signed…… Date…….

Researcher Name in block capitals ……..

If during your participation in this study you feel the information and guidelines that you were given have been neglected or disregarded in any way, or if you are unhappy about the process, please contact the Secretary of the Maynooth University Ethics Committee at research.ethics@mu.ie or +353 (0)1 708 6019. Please be assured that your concerns will be dealt with in a sensitive manner.

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Two copies to be made: 1 for participant, 1 for researcher

INFORMATION AND CONSENT FORM
OneNote CBA Volunteer

Information Sheet

Purpose of the study
I Maureen Kenneally, am a Doctorate of Education student in Maynooth University. As part of my course I am undertaking an Action Research study to look at "How we can improve the use of ICT by teachers in their teaching?"

What will the study involve?
The study will involve volunteers from the staff ICT Committee, teaching staff and myself as lead researcher (also a member of the CARC) collaborating in Action Research with the aim of achieving improved use of ICT in teaching in our school.

This study will require data collection in two forms.

Firstly, CARC will work with me in considering our data collection methods. I propose that we collect data in two ways, online survey and validation focus group interviews. The CARC will collaborate in drawing up an online staff survey. We will then invite teachers to complete the survey on their current use of ICT in their classrooms and how they can be supported to improve their use of ICT in teaching.

Secondly, data collection will involve validation focus group interviews. Representatives from the CARC (including myself) will carry out validation focus group interviews with a voluntary group of teachers from the staff. The selection of these representatives will depend on availability on the chosen date. I will invite teachers to volunteer to form the validation focus group. Through the validation focus group interviews the CARC will hope to add to the online survey data set. The results of the online survey will provide a framework for carrying out the focus interviews. All members present from the CARC will work together in carrying out the interviews.

These validation focus group interviews will be digitally recorded so that we, the CARC can review responses in our collaboration on what action to take to address problems raised. No volunteer on of the validation focus group will have their identity made known in the write up of this project. All digital recordings will be securely stored by me and will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

Who has approved this study?
This study has been reviewed and received ethical approval from Maynooth University Ethics Committee and the Education Doctoral Research Committee. You may have a copy of this approval if you request it.

Why have you been asked to take part?

You have been asked to take part in this study because, as a member of the Mathematics or Geography department with upcoming CBAs this research links directly with CBAs using a new digital approach one we think you and your students will benefit from.

Do you have to take part?
No, you are under no obligation to take part. I hope you will agree to participate but it is your choice, there is no onus on any member of staff to join the research community and no offence will be taken if you decide not to participate. As this research will be carried out over a number of stages please feel free to withdraw from the process at any stage without giving any reason. You are also free to withdraw your information up until such a time as the research findings are reported.

What information will be collected?
The information that will be collected will include your name on the consent form. As teachers I would invite you to complete the online survey which will provide data of your experience and reflections of your use of ICT in your teaching.

Will participation in the study be kept confidential?
Yes, all information that is collected about you during the course of the research will be kept confidential. All hard copies will be locked in a secure cabinet at the researchers' home. Electronic information will be encrypted/password protected and stored securely on the Maynooth University server and will be accessed only by me, Maureen Kenneally and my supervisor, Dr. Anthony Malone.

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No information will be distributed to any other unauthorised individual or third party. If you wish, a copy of the data you provide can also be made available to you.

What will happen to the information which you give?
All the information you provide will be kept at Maynooth University in such a way that it will not be possible to identify you. Electronic data will be encrypted, and hard copies of the data will be kept in a secure cabinet. On completion of the research, the data will be retained on the MU server. After ten years, all data will be destroyed. Manual data will be shredded confidentially by me and electronic data will be reformatted or overwritten by me in Maynooth University.

What will happen to the results?
The research will be written up and presented as a thesis. It may also be presented at National Conferences and/or written and presented for publication. A copy of the research findings will be made available to you upon request.

What are the possible disadvantages of taking part?
I do not envisage any possible disadvantage to you taking part in this research study. If you feel that the research has not been carried out as described above, you may contact my supervisor, Dr. Anthony Malone,
Phone: 01-7083760,
Email: anthony.malone@mu.ie

Any further queries?
If you require any further information you may contact me,
Maureen Kenneally
Phone : 087-2903548
Email: maureen.kenneally.2018@mumail.ie

If you agree to take part in the study, please complete and sign the consent form overleaf.

Thank you for taking the time to read this.

Consent Form

I……agree to participate in Maureen Kenneally's Action Research study titled. "How can I as senior school leader work with teachers to improve the use of ICT in teaching in our school?"

Please tick each statement below:

The purpose and nature of the study has been explained to me in writing. I've been able to ask questions, which were answered satisfactorily. ☐

I am participating voluntarily. ☐

I agree to participate in an online survey followed by validation focus group interviews. ☐

I understand that I can withdraw from the study, without repercussions, at any time, whether that is before it starts or while I am participating. ☐

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I do not agree to quotation/publication of extracts from my assignment. ☐

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I do not agree to quotation/publication of extracts from my interview. ☐

Signed: _____ Date: _____

Participant Name in block capitals: _____

I the undersigned have taken the time to fully explain to the above participant the nature and purpose of this study in a manner that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Signed…… Date……..

Researcher Name in block capitals ……..

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