Ed-ventures in Wonderland: Creating an innovative curriculum for integrating iPads in Religious Education.

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Declaration

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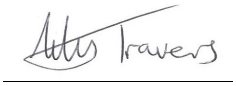
Signed: 

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Acronyms

AFL: Assessment For Learning

BYOD: Bring Your Own Device

CBA: Classroom Based Assessment

CPD: Continuous Professional Development

DES: Department of Education and Skills

EEA: Educational Entrepreneurial Approach

ICRE: Irish Centre for Religious Education

ISA: Irish Schools Head Association

ICT: Information Communication Technology

ITE: Initial Teacher Education

JCPA: Junior Cycle Profile of Achievement

LAT: Learning Activity Types

PDST: Professional Development Services for Teachers

MDI: Mater Dei Institute of Education

MiTE: Mobile Technology in Initial Teacher Education

NCCA: National Council for Curriculum and Assessment

NQT: Newly Qualified Teacher

OECD: Organisation for Economic Co-operation and Development

QR: Quick Response

RE: Religious Education

SAMR: Substitution Augmentation Modification Redefinition Framework

SPHE: Social Personal Health Education

SIP: School Improvement Plan

TPACK: Technology, Content and Pedagogy Framework

TY: Transition Year

VLE: Virtual Learning Environment

ZPD: Zone of Proximal Development

Abstract

Ailís Louise Travers

Ed-ventures in Wonderland:

Creating an innovative curriculum for integrating iPads in Religious Education

One of the aims outlined in the National Digital Strategy for Schools 2015-2020 is to develop and promote examples of effective integration of ICT in teaching, learning and assessment (Department of Education and Skills 2015). This qualitative action research study provides an example of effective integration of ICT for teaching religious education in a 1:1 iPad environment. Using the Educational Entrepreneurial Approach to Action Research (Crotty 2014) an innovative curriculum that focused on promoting student collaboration and moved students from being consumers of content to creators of content was developed.

Through the Educational Entrepreneurial Approach to Action Research (Crotty 2014), my educational values became my guiding principles and the questions raised in the literature were aligned with my own practice. Literature regarding the role of technology in education was examined. The TPACK framework (Koehler and Mishra 2012) for integrating technology, pedagogy and content was chosen to guide the research and curriculum development.

A research journal was kept throughout this study and cycles of implementation, performance, and feedback from colleagues and peers informed and validated the creation of the curriculum. Evidence is presented to show the transformative impact of the research process on me personally, professionally and in the wider context.

Transformations that occurred as a result of this research include improved knowledge and skills in the field of eLearning, enhanced collaboration and creativity within my work context, and the creation of a curriculum on places of religious significance called '*Wonderlands*' with an accompanying guide for teachers. This curriculum successfully integrates technology, pedagogy and content and through it students collaborate to create their own iBook using a variety of apps and websites that enhance their digital literacy skills.

Conference Presentations

McTaggart, L. Travers, A. Whetting the APPetite: exploring the use of Apps in R.E. *Loreto Network R.E Teachers and Chaplains Conference*. Clayton Hotel, Leopardstown, Dublin. 3rd February 2017.

Curtis, S. Travers, A. Wonderlands iBook project. *Féilte*. Teaching Council Festival of Teaching and Learning. RDS, Dublin, 1st October 2016.

Travers, A. From textbooks to iPads: developing a holistic educational practice in Religious Education. *Mobile Technology in Initial Teacher Education (MiTE) Conference*, Galway Bay Hotel, Galway. January 15th 2016.

Travers, A. How my students and I use technology to support learning and assessment. *Irish Schools Head Association (ISA) Networking Day.* Dublin November 12th, 2015.

Travers, A. Teaching R.E. in a 1:1 classroom. *Loreto Network R.E Teachers and Chaplains Conference*. Stillorgan Park Hotel, Dublin. January 29th 2015.

Awards

2016. Creative Schools Award. *Association of Creativity and Arts in Education*

PROLOGUE

When a friend asked me what it was like to begin to teach with iPads I said it reminded me of Lewis Carroll's story *Alice in Wonderland*. The classic tale has always been a favourite of mine. It resonated with me as a child because my name is the Irish for Alice. I felt a great connection with the main character and identified with her sense of adventure and vivid imagination, both characteristics that I found useful for integrating iPads in education. Of course, before Alice got to Wonderland she found herself falling down a dark hole with no idea where she would end up. This sums up my initial experience when I began to integrate iPads in my teaching. This part of the story scared me as child, and it scared me as an adult. Everything seemed uncertain and the amount of apps, websites and distractions that the iPads gave access to was overwhelming.

At first I was ashamed to admit how difficult I found it to adjust to teaching with iPads because I had just returned to teaching from secondment as a 'Digital Specialist' in Veritas, a publishing company and retailer owned by the Irish Catholic Bishops' Conference. No one was more surprised than me to be appointed as the 'Digital Specialist'. I did not consider myself to be particularly 'good' with technology. The technology prevalent in education today was not invented when I was a student. However, the change in technology in education in my lifetime has been rapid. Tapscott (2009) suggests those born between January 1977 and December 1997 are the Net Generation, which he describes as being curious and adaptable with a global orientation (Tapscott 1998). Based on these dates I can classify myself as being part of the Net Generation. According to Howe and Strauss (2003) I am also part of the Millennial Generation, which they define as those born between 1982–2000. They describe Millennials as optimistic, team-oriented, high-achieving, rule-followers with community and technology being two characteristic core values (Howe and Strauss 2003). Born on the cusp of these so called generational divides has left me with an interesting perspective on the use of technology in education. In primary school I don't recall any technology but I had a toy typewriter. In secondary school we had a computer class where the focus was learning to type (my worst subject) and we got a computer at home that brought the wonder of the World Wide Web into my life. When I was a student teacher we were

trained to use the technology that was widely available in schools, mainly acetates and overhead projectors, but we also had computer tutorials where I discovered the joy of creating PowerPoints. When I began teaching my acetates were of more use than my PowerPoints but the range of technology and access to it varied greatly from school to school. However, things were changing fast.

My passion for technology was only ignited when I completed a module with Dr. Enda Donlon as part of my Masters in Religion and Education. I began to realise the potential of technology as a tool for education. I was intrigued by a project being worked on by a team from Veritas and the Mater Dei Institute of Education (MDI) developing an interactive website for RE called *FaithConnect.* My Master's thesis was an evaluation of the pilot phase of this project. When I was initially seconded to Veritas I joined the *FaithConnect* team. When the *Credo* series, Veritas' theology textbook series for Catholic High Schools in the USA, needed a website to accompany it I was given the role of conceptual designer and project manager. My confidence with technology grew as I saw my ideas become a reality. However, upon my return to the classroom after four years working in publishing, my confidence was shaken. I found the arrival of iPads to be a significant change to my teaching context that I was not prepared for. This change made me stop and wonder how I could adapt my lessons to best address this new technology. In order to do this I began to reflect on the kind of teacher I wanted to be and I found myself questioning my values and challenging my own assumptions. This questioning was the start of my research and the start of my adventure with iPads in education, or as I began to call it my 'ed-venture'.

Creativity is intelligence having fun
- Unknown

If real learning is to take place, our classrooms must be dependent on the collaboration of its learners, not solely on the knowledge of its teachers
- Robert John Meehan.

Technology will not replace great teachers but technology in the hands of great teachers can be transformational
- George Couros

CHAPTER ONE
INTRODUCTION AND BACKGROUND

> But I don't want to go among mad people, Alice remarked.
> Oh, you can't help that, said the Cat: we're all mad here. I'm mad. You're mad.
> How do you know I'm mad? said Alice.
> You must be, said the Cat, or you wouldn't have come here.
>
> Alice in Wonderland by Lewis Carroll (1832 - 1898)

1.1 Introduction

This chapter outlines the 'what', 'where' and 'why' of this research. The 'what' or the overall aim of this research was to create an innovative curriculum for integrating iPads in Religious Education (RE). The 'where' or context of this research was within my workplace, Loreto College, St. Stephen's Green. This is a Catholic all-girls post-primary school (with students from ages 12-18) in Dublin, Ireland. This research was situated within the overall context of the changing educational landscape of post-primary education in Ireland in general, and within post-primary RE in particular. The 'why' or rationale for this research was threefold:

- To improve my pedagogy and student learning in a 1:1 iPad environment. (A 1:1 iPad environment is one where students have access to their own individual iPad).
- To explore the potential of iPads for facilitating student collaboration and creativity.
- To engage and motivate students in non-examination RE.

Conscious of Papert's (1987) term 'technocentrism', which he defined as the fallacy of referring all questions to the technology, I didn't want the introduction of iPads to dominate the research or be the sole focus of developing a new curriculum. This research did not seek to address whether schools should or should not introduce 1:1 technology nor was it focused on the advantages and disadvantages for those who do. Instead, the idea of integration was at the heart of this research. Earle (2002) stated:

> Integrating technology is not about technology - it is primarily about content and effective instructional practices. Technology involves the tools with

> which we deliver content and implement practices in better ways. Its focus must be on curriculum and learning. Integration is defined not by the amount or type of technology used, but by how and why it is used. (p. 8)

Influenced by Earle's insight I sought to create a curriculum that would effectively integrate iPads with content and pedagogy. To achieve this I employed an Action Research methodology and was guided by the Educational Entrepreneurial Approach (EEA) to Action Research (Crotty 2014). This approach was developed especially for educational researchers seeking to create an innovative artefact and/or curriculum with an emphasis on technology. Following the four key strands of this methodology I had to:

1. Explore: my educational values, passions and work culture.
2. Understand: the skills and talents I have to create change, the literature to inform this change and the methodology to guide me.
3. Create: an original innovative multimedia artefact and/or curriculum with critical feedback from peers, colleagues, students, and my supervisors to ensure quality.
4. Show Transformation: with evidence of new skills and confidence gained and demonstrating the impact of the research in my workplace.

This research produced both an innovative curriculum and a multimedia artefact. The curriculum created as a result of this research is for Junior Cycle RE (for students ages 12-15) on places of pilgrimage called '*Wonderlands*'. In education, curriculum can be broadly defined as the totality of student experiences that occur in the educational process. However, the term often refers specifically to a planned sequence of instruction, lessons and content taught in a specific course and it is in this sense that it is used throughout this thesis. The *Wonderlands* curriculum is presented as an interactive iBook artefact. An iBook is an electronic book (eBook) specifically designed for Apple products such as iPads. This research also sought to move students from being passive consumers of content to active creators of content. The *Wonderlands* curriculum integrates a range of technology tools to present new content to students. Students are introduced to a variety of places of religious significance through activity-based learning culminating in the creation of their own iBook.

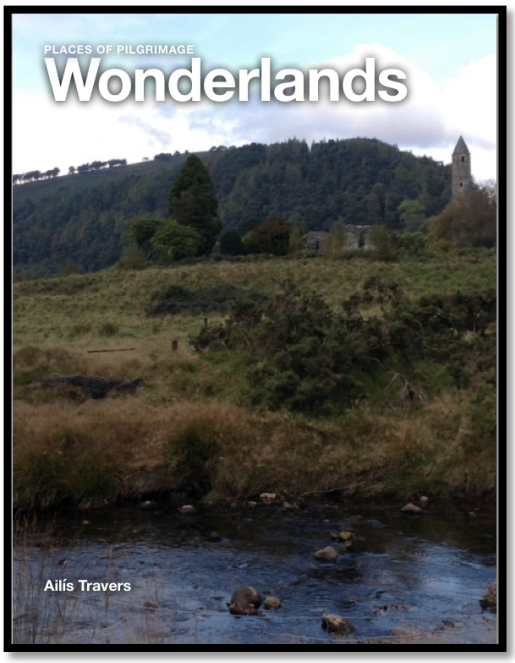


Figure 1.1: The cover of the Wonderlands iBook

1.2 Research question

From the exploration of my educational values and workplace culture as well as from the insights gained from my examination of the literature I formulated the following research question to help me integrate iPads in RE:

> *How can I create an innovative curriculum for Religious Education in a post-primary school in Ireland that integrates technology, pedagogy and content?*

The TPACK framework (Mishra and Koehler 2006), a theoretical framework designed specifically for integrating technology, pedagogy and content, guided the research. Within the context of my work place, I carried out this research in order to improve my practice and benefit my students' learning in a 1:1 iPad environment. This research also contributes new knowledge for the study of RE at post-primary level through the creation of an original curriculum and for the use of iPads in education by providing an example of effective integration.

1.3 Rationale for the research

I will now provide the rationale for embarking upon this research. Two significant changes occurred in my work context in recent years. In the academic year 2013-

2014 iPads were introduced into our school when an iPad trolley containing a class set of twenty-four iPads were made available for teachers to use with their classes. The following year we began to phase in a 1:1 iPad programme with the incoming first year students arriving with their own personal iPads in lieu of a heavy bag of textbooks. The second change was specific to the RE department, as the decision was made to end our participation in the Junior Certificate State Examinations for RE. RE is still retained as a core subject and all junior cycle students have RE classes three times a week. The first group of students to arrive with iPads in September 2014 were also the first group to have non-examination RE classes.

In light of these two changes I embarked upon this research. It was an opportune time to review and reform the approach to junior cycle RE in our school. We continued to work from the Junior Certificate Religious Education Syllabus (JCRES) but with more flexibility and freedom with content and time. This afforded me the chance to create and implement the *Wonderlands* curriculum. As a department the two biggest concerns we shared when introducing non-examination RE were how to assess it, and how to keep students engaged and motivated. While we would continue to follow the whole school approach to continuous assessment and Assessment for Learning (AFL) throughout the year, we wanted something to replace the focus in third year that was usually centred on the JCRES specific exam preparation. I was particularly interested in maximising the potential of 1:1 technology to engage and motivate students, as well as developing a digital component to the assessment of our subject. The creation of *Wonderlands* sought to address both of these concerns.

The rationale for this research also rests on the premise that research on the use of iPads in RE at post primary level is absent. Furthermore, having conducted previous research on the use of technology in RE for my Masters in Religion and Education I am aware that research on the use of technology in RE in Ireland is scarce (Travers, 2009). This research can make a valuable contribution to knowledge about the use of technology in RE in a 1:1 iPad environment and demonstrate how theories for technology integration can be implemented in RE to improve practice.

1.4 My educational values

The starting point for this research and for developing the *Wonderlands* curriculum was to identify and articulate my educational values. Exploring personal values is an intrinsic aspect of Action Research (Lombardo 2011, McNiff and Whitehead 2006) and is central to the first stage of the EEA (Crotty 2016, 2014, 2012). Lombardo (2011) defines values as the ideas and standards we use to direct our behaviour, in making judgments about what is important in our lives. My educational values are derived from my diverse experiences studying and working within the field of Religious Education. The educational values that underpin this research are collaboration, creativity and courage.

My understanding and appreciation of collaboration, creativity and courage developed most notably during my time working in educational publishing. I experienced a more collaborative work environment than in teaching, where regardless of how closely you work with colleagues, you still teach your students by yourself, more often than not behind closed doors. As Bennett and Rolheiser pointed out "the real world does not work in rows" (2001, p. 28). Removed from the safety of my classroom I found myself at a round table sharing ideas and contributing to projects that were developed and delivered through teamwork. The Horizon Report (Johnson et al. 2015) emphasised the potential of technology for global collaboration. I experienced this first hand as I regularly collaborated with colleagues and teachers in the US. Through the power of collaboration I had the opportunity to work in numerous areas of publishing, all the time developing new skills and losing sight of my perceived limitations of what was possible.

As a result of working as part of dynamic teams I witnessed the benefits of collaboration in enhancing creativity. Robinson (2011) defines creativity as "the process of developing original ideas that have value" (2011, p.3) and links these to imagination which he says is the root of creativity and innovation. I observed how my own ideas were valued and appreciated by my colleagues, which affirmed my own creativity. Robinson clears up some common misconceptions about creativity explaining how all humans are creative, and illustrates how it applies to every area of life, not just the arts. Bennett and Rolheiser (2001) argued that effective teaching has to be creative but that teachers often find themselves working in a system that

undermines creativity. I certainly believe that there is a lack of focus on creativity in education but Robinson (2006) went so far as to say that we have been educated out of our creativity. However, he asserts that the good news is that creativity can be taught, developed and refined. (Robinson 2010).

Courage has been one of my educational values since reading 'The Courage to Teach' by Parker J. Palmer. He believes in the importance of teachers having good self-knowledge because "we teach who we are" (Palmer 2007, p. 15). This in itself makes teaching a courageous act. The change from teaching to publishing took a huge amount of courage. I had most definitely stepped out of my comfort zone but as the anecdote suggests, that is where the magic happens. My appreciation of courage as a both a personal and professional value was further cemented during this time. According to Brown there are four pillars of courage that can be cultivated (Lewis 2017; Brown 2015). The first is 'vulnerability' or the willingness to show up and be seen despite uncertain outcomes. This is important for innovation, as it requires risk and uncertainty. Brown asserts that vulnerability is the birthplace of innovation, creativity and change (2017, 2015). The second pillar she outlines is 'trust' describing it as the courage to trust others and the integrity to be worthy of trust from others (Brown 2015, 2013). Brown concludes that trust is essential in a collaborative workspace. Her third pillar is 'rising skills' which she defines as the resilience to get back up when you fall, an inevitable consequence of courage (Brown 2015). Finally, the fourth pillar is 'Clarity of Values' or as Brown explains, "the thing that reminds you why you tried in the first place" (Lewis 2017).

After witnessing the power of embracing collaboration, creativity and courage in the field of educational publishing I returned to the classroom with renewed enthusiasm for fostering these values in teaching and learning. These values also drew me to the EEA where collaboration is essential as the knowledge created is part of a cooperative process involving the practitioner and the university and also linking to the wider social context (Crotty 2014). Creativity is encouraged and celebrated throughout the process and courage is required to allow for risk-taking and innovation (Crotty 2016).

1.5 My work context and culture

This research was situated within my workplace, Loreto College St. Stephen's Green. This is a Catholic secondary school for girls in Dublin city centre. It is part of a worldwide network of Loreto schools run by the Institute of the Blessed Virgin Mary, which was founded by Mary Ward (1585-1645). Ward pioneered a new type of religious life for women adapted from the way of life that St. Ignatius of Loyola gave to the Society of Jesus. She challenged women to "provide something more than ordinary in the face of the common need" (Ward). The Loreto philosophy of education is centred in God, rooted in Gospel values and is characterised by the five core Loreto values; Freedom, Justice, Sincerity, Truth and Joy (Loreto Education Trust - Ireland 2016):

- *Freedom.* This value allows us a school community to make mistakes, reflect on them and to grow, as we are encouraged to accept responsibility for our decisions and act out of love not fear. The support and encouragement I have received from my school community to carry out this research gave me the freedom to do so without any fear or expectations limiting it.

- *Justice.* Mary Ward encouraged people to be "seekers of truth and doers of justice". Justice can be described as living in right relationship; with God, myself, others and creation. This involves recognising the dignity of each individual and becoming aware of the rights and responsibilities of all. I am aware the rights of everyone who is a participant in my research and my responsibility to ensure quality research is produced.

- *Sincerity.* Mary Ward placed great emphasis on sincerity stating "we should be such as we appear and appear such as we are". A life of integrity is one of sincerity, without masks or pretence. In this research as I share my personal values, insights and experiences as they evolved throughout my reflective journals. I strive to remove any masks to show who I am as a teacher with sincerity and integrity.

- *Truth.* Truth was synonymous with integrity to Mary Ward, particularly the profound truth of who we are, and what gives meaning to our lives. Mary Ward

encouraged her followers to "love and speak the truth at all times". When I was a student, in a Dominican school, our school motto was '*Veritas*' meaning truth. Since my own school days, I have loved the quote from the St. Catherine of Siena, a Dominican Saint, who said, "be who God meant you to be and you will set the world on fire". This to me links with sincerity, and reminds me to be true to myself throughout the research process and share the truth of my experience.

- *Joy*. According to Mary Ward joy is the result of living out the other values and she stated "joy overflows from the heart of women who are free, just and sincere". It is also something worth valuing in and of itself. My favourite Loreto value is joy and I wrote a reflection on this value for my students to share how I see JOY as standing for Jesus, Others and Yourself (Travers 2015). Throughout my research journey, although it was not always easy, I was glad that I had the opportunity to explore my values and research something that I felt passionately about. I was excited to have the opportunity to use my talents and develop new skills to create something original and useful. I now feel immense joy to be able to share my work and show the transformation that has occurred.

These organisational values have become my own adopted values and as a teacher I embrace them as an aspiration and a daily reality. Along with my own values of creativity, collaboration and courage, these organisational values underpinned this research. These values were paramount in ensuring that my workplace provided a "safe and authentic environment to take risks and allow honest feedback" (Crotty 2014):

1.6 Framing the research

While this research took place within the specific context of my workplace and our unique work culture, it was also positioned within and influenced by the wider context of post-primary education in Ireland and within the subject specific context of RE. Ireland's post-primary school system and digital learning landscape are changing. New strategies and programmes are being implemented that aim to provide a more innovative teaching and learning experience. In particular *The National Digital Strategy for Schools 2015-2020* is making significant changes to the use of technology in schools and *The Framework for Junior Cycle* is changing

the content, pedagogy and assessment approaches for the first three years of the post-primary school curriculum. These key documents as well as the current context of Junior Certificate RE will now be explored.

1.6.1 The National Digital Strategy for Schools 2015-2020

There has been a strong emphasis on developing the use and infrastructure of Information and Communication Technology (ICT) in Irish schools in recent years. ICT is a broad term that can be defined as:

> A diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. (Blurton 1999, p.1).

This importance of ICT in education is evident within reports and policies from the Department of Education and Skills (DES) that have indicated that it is essential for economic, social and pedagogical reasons (DES 2012; DES 2008). ICT is embedded in all the recent major national policies on education in Ireland including:

- School Self-Evaluation Guidelines 2016-2020 Post-Primary (DES 2016)
- Framework for Junior Cycle (DES 2015)
- The National Strategy to improve Literacy and Numeracy (DES 2011)

While these documents all highlight the importance of ICT *The National Digital Strategy for Schools 2015-2020: Enhancing Teaching, Learning and Assessment* is the most significant document for ICT in education as it outlines the overall vision and plan of the DES for the integration of ICT. This vision aims to:

> Realise the potential of digital technologies to enhance teaching, learning and assessment so that Ireland's young people become engaged thinkers, active learners, knowledge constructors and global citizens to participate fully in society and the economy. [DES 2015, p. 5]

This document adapts the UNESCO (2011) 'ICT Competency Framework for Teachers', a global framework developed for teachers to facilitate ICT integration that aims to help countries develop national plans and policy. As figure 1.2 illustrates the five key principles that underpin the *National Digital Strategy* show the intended

depth of integration of technology within teaching and learning. From the promotion of a constructivist pedagogical approach and ethical use to the role of ICT for supporting the inclusion and diversity of learners to the realisation that ICT needs to be planned for and embedded in curricula, policies and teacher education, the relevance and reach of this document's vision is vast.

Principle	Descriptor
1. A Constructivist Pedagogical Orientation underpinning the embedding of ICT in schools.	A constructivist pedagogical orientation supports teachers in effectively using ICT with their students i.e. learners are actively involved in a process of determining meaning and knowledge for themselves.
2. The use of ICT in teaching, learning and assessment can enhance the learning experiences of all students.	ICT plays an important role in supporting inclusion and diversity for all learners by enhancing learning opportunities for all students.
3. The use of ICT in teaching, learning and assessment is embedded in school curricula, Department policies and teacher education.	The Department and its agencies will play a proactive role in implementing the Digital Strategy for Schools.
4. ICT is used in an ethical and responsible way.	Schools and the Department enable all users to use ICT in an ethical and safe way.
5. ICT Planning is required to ensure ICT integration in teaching, learning and Assessment.	All levels of the education system are engaged in inclusive planning for the effective integration of ICT.

Figure 1:2: The Key Principles of the National Digital Strategy 2015-2020 [DES 2015, p. 8]

Supports are already in place to help implement the strategy and the document highlights some of the key ones. Access to digital content is a practical requirement for implementing ICT in school and there are a wide range of resources available through *Scoilnet*, Ireland's education portal for primary and post-primary schools. The Professional Development Support Service for Teachers (PDST) provides a wide range of training and support for ICT integration in schools. The *National Digital Strategy* also highlights the work of the Teaching Council of Ireland, praising the culture of innovation and collaboration it promotes, and making specific reference to *FÉILTE*, the annual Teaching Council Festival of Teaching and

Learning, as a key event at which to share best practice.

The *National Digital Strategy* (2015) envisions the teacher taking on a more facilitative role, with a focus on feedback for the students who are encouraged to create and innovate and manage their own learning activities. It also sees ICT supporting "collaborative project-based learning activities that go beyond the classroom" (Butler et al. 2013, p.8). Teachers are encouraged to take ownership of their own professional learning and to participate in online learning communities. One of the aims outlined in the *National Digital Strategy* is to develop and promote examples of effective integration of ICT in teaching, learning and assessment (2015, p.34.). This research, and the curriculum developed from it, offers one such example.

1.6.2 Junior Cycle reform

The advent of the new Junior Cycle means that significant changes to teaching in post-primary schools are imminent. The *Framework for Junior Cycle* published by the DES in 2015 emphasises that:

> At the heart of Junior Cycle reform lies the need to provide students with quality learning opportunities that strike a balance between gaining knowledge and developing a wide range of skills, attitudes and thinking abilities. (DES 2015)

The framework is based around eight overarching principles of learning; wellbeing, learning to learn, choice and flexibility, quality, creativity and innovation, engagement and participation, continuity and development and inclusive education (2015). The learning at the core of the new Junior Cycle across the curriculum is informed by twenty-four statements of learning. Finally, eight key skills have been identified to underpin the successful learning for all students. (See table 1.1 for the eight key skills and Appendix A for a full overview of their components).

The *Framework for Junior Cycle* (DES 2015) indicates an emphasis on the integration of ICT in line with the *National Digital Strategy*. ICT is embedded both implicitly and explicitly throughout the framework's vision for the future. The last of the twenty-four learning statements is specific to technology, as it outlines that the

student "uses technology and digital media tools to learn, work and think collaboratively and creatively in a responsible and ethical manner" (DES 2015, p.12). This applies to all subjects and short courses. However, more significantly, each of the eight key skills that underpin the framework has a digital component. This ensures that technology can no longer be an add-on, but must be embedded in a new teaching approach across the curriculum. The Digital components of the key skills are:

Key Skill	**Digital Component**
1. Managing Myself	Using digital technology to manage myself and my learning.
2. Managing Information and Thinking	Using digital technology to access, manage and share content.
3. Working with Others	Working with others through digital technology.
4. Communicating	Using digital technology to communicate.
5. Being Literate	Exploring and creating a variety of texts, including multi-model texts.
6. Being Numerate	Using digital technology to develop numeracy skills and understanding.
7. Staying Well	Being responsible, safe and ethical in using digital technology.
8. Being Creative	Stimulating creativity using digital technology.

Table 1.1: Digital Components in Junior Cycle key skills (DES 2015, p.13)

These skills are essential for the digital era in which we live. The *Wonderlands* curriculum aims to facilitate the opportunity for students to develop and practice these skills in RE.

The impact of Junior Cycle reform on RE has lead to much debate. Going forward the new *Framework for Junior Cycle* states that schools may continue to provide RE programmes in accordance with their ethos (DES 2015). The Irish Catholic Bishops Conference produced a document entitled *Religious Education and the Framework for Junior Cycle* (2017) which states that what has been achieved since the introduction of the JCRES can be built on if the imminent changes are used as an opportunity to re-imagine the role and contribution of RE. While it is envisioned that there will flexibility for schools to design their own RE programme it "must be

informed by the *Framework for Junior Cycle* (2015), the RE subject specification, the particular learning needs and interests of the students and must reflect the characteristic spirit of the school" (Irish Catholic Bishops Conference 2017). Within the context of schools under Catholic patronage the Irish Bishops RE will retain its current status as a subject, taught by qualified teachers for a minimum of two hours per week for each of the three years of the Junior Cycle (Irish Catholic Bishops Conference 2017). With regards to assessment schools have a choice whether to present for an externally assessed state certified assessment task at the end of third year. If RE is not going to be externally assessed students can still present two Classroom Based Assessments (CBAs) that can be recognised as part of their Junior Cycle Profile of Achievement (JCPA) under 'Other Areas of Learning'.

1.6.3 The current context of Junior Certificate Religious Education

The current *Junior Certificate Religious Education Syllabus* (JCRES) was introduced to schools in September 2000 and was examined for the first time in June 2003. This was followed by the *Leaving Certificate Religious Education Syllabus* (LCRES), which was introduced in September 2003 and examined for the first time in June 2005. Schools have the choice to offer RE as an examination subject or not. Both the JCRES and LCRES are based on objectives relating to knowledge, understanding, skills and attitudes (DES 2003; DES 2000) which should be the focus of both examination and non-examination RE. Regardless of whether the subject is being taught for examination or not the RE syllabuses are designed to facilitate what Grimitt (1987) described as 'learning about religion' and 'learning from religion'. Byrne captures the strengths of the state syllabuses stating:

> As well as fostering an awareness of the human search for meaning and its continued expression in religion, these syllabuses…identify understandings of God, engagement with religious traditions, and in particular the Christian tradition, and how religion, and non-religious interpretations of life, have contributed to personal development and to the culture in which we live. (Byrne 2013, pp. 210-211).

The idea of RE having a dual role of learning 'about and from' was first outlined by Grimmitt and Read (1977). This dual role of RE allowed for the development and implementation of a state syllabus suitable for students of all faith traditions and

none while retaining the intention of supporting students in their own search for meaning and faith formation.

> The students' own experience of religion and their commitment to a particular religious tradition, and/or to a continuing search for meaning, will therefore be encouraged (DES 2000).

The JCRES is fully supported by the Catholic Bishops who developed *Guidelines for the Faith Formation and Development of Catholic Students* to support the introduction and use of the syllabus (Irish Catholic Bishops Conference 1999). This research is situated in this post-modernist view of RE that blends the cognitive and affective dimensions of the subject in order to contribute to the holistic nature of the subject matter and cater to students of all faiths and none.

For schools not offering RE as an examination subject for the Leaving Certificate or for students not choosing it in schools that do, the NCCA developed *A Curriculum Framework for Senior Cycle* which was published in the LCRES Teacher Guidelines (2005) as a planning tool to assist schools designing a senior cycle non-examination programme. There are no alternative guidelines available for schools not offering RE as an examination for the Junior Certificate. I would argue that this is an oversight and missed opportunity to help teachers maximise the potential of non-examination RE. The introduction of the syllabus led to a surge in resources available for RE. Schools offering non-examination RE use the many textbooks and resources available for it, effectively following the same syllabus. However, there remains an emphasis on exam preparation in these textbooks. The one area where the need for change is most evident is finding an alternative to replace the journal work element of the JCRES. The journal work component is an important element in the JCRES and is worth 20% of the final assessment. It is an opportunity for students to carry out research on one prescribed title from a list of twelve titles that are published each year. The rationale for the journal work as outlined in the syllabus (DES 2000, p74) says that it will:

- Facilitate a variety of teaching and learning methods
- Promote the development of skills in research, analysis, drawing conclusions, presentation, etc.

- Afford the students the opportunity to encounter religion as part of life.
- Facilitate the exploration of an area of personal interest or concern to the student

The syllabus also provides an overview of skills that the journal work fosters including research and reflective skills. (See Appendix B for the full list). This research identified a gap in non-examination RE as there is no specific opportunity or support for students to carry out research. There is also no extra curriculum content to replace the time exam students would have spent researching and writing up their journals. The origin of the Wonderlands curriculum was to design an appropriate and innovative curriculum alternative to the journal work for non-examination RE. It started as a research project for non-examination students and later expanded to include new curriculum content as the need for background lessons became evident during the research process. Going forward into the new era of Junior Cycle reform, with the specific details of the new RE specification as yet unknown, it is hoped that this curriculum could be the basis for one of the CBAs in the new JCPA.

1.7 Layout of thesis

This section provides a brief summary of the structure of the thesis. Chapter two examines the literature surrounding education in a digital age, twenty-first century pedagogy and the areas relating specifically to RE content and course design that I had to consider when creating the *Wonderlands* curriculum. Chapter three describes the methodology and methods employed in this research. Action Research and specifically the EEA are detailed and I explain my rationale for choosing this approach over others. Chapter three also demonstrates how I adhered to high standards of ethics, validity and rigour throughout the research process. Chapter four illustrates the Action Research cycles carried out over three years, describing my initial exploration of integrating iPads into my RE lessons and charting how this shaped my vision for the new curriculum. It then outlines how the curriculum and iBook artefact were created. Chapter five presents the created *Wonderlands* curriculum as evidence of how it facilitates an integrated approach to RE. It also describes the impact of its implementation thus providing evidence of the transformation that has occurred in my teaching practice and in my workplace. Chapter six presents the conclusions, the contributions to new educational

knowledge and offers recommendations and my final reflections on the research process.

CHAPTER TWO
LITERATURE REVIEW

It would be so nice if something made sense for a change.
Lewis Carroll, Alice in Wonderland

2.1 Introduction

In this chapter I will examine the literature pertaining to my research question:

> *How can I create an innovative curriculum for Religious Education in a post-primary school in Ireland that integrates technology, pedagogy and content?*

This literature review will explore the importance and relevance of understanding the relationship between content, pedagogy and technology in order to develop TPACK (Mishra and Koehler 2006) and create an integrated approach in RE. The three distinct themes of technology, pedagogy and content that are pivotal to my research question will be examined in turn. In order to delve further into the literature I will use sub-themes to assist in organising and structuring my research and thinking based on the main components of the TPACK framework (Mishra and Koehler 2006). Firstly within the general theme of technology the necessary background technology knowledge for integrating iPads will be examined. Under pedagogical knowledge key aspects of 21st century learning will be explored. Then linking these two themes together the specific 'technological pedagogical knowledge' needed for adapting pedagogy for a 1:1 classroom will be outlined. Moving to the content specific considerations the literature will look at how Religious Education (RE) content needs to be rooted, relevant and responsive to the current climate, in this case in contemporary Ireland. Reflecting on specific 'pedagogical content knowledge' the unique nature of the subject will be addressed and Shared Praxis (Groome 1999) will be reviewed for its suitability as an appropriate pedagogical approach for RE in Ireland today. Finally the specific links between Information and Communication Technology (ICT) and RE will be examined. To begin, the literature review will detail two theoretical frameworks for ICT integration, starting with the TPACK framework.

2.2 Theoretical frameworks for ICT integration

The integration of ICT into teaching, learning and assessment is a complex and challenging process. The Organisation for Economic Co-operation and Development (OECD) report on Students, Computers and Learning found that the mere presence of ICT in a school does not equate to its effective use (OECD 2015). Livingstone suggests that to achieve successful ICT integration involves the redesign of "educational infrastructure, teacher training [approaches], curriculum structures and materials, classroom practices and modes of assessment" (Livingstone 2012, p.22) indicating that successful ICT integration involves re-imagining every aspect of education. As a starting point for successful ICT integration theoretical frameworks can provide a useful starting point for planning and implementation. They can also be useful tools for evaluating the progress of ICT integration. There are a number of contemporary frameworks designed specifically for mobile learning, such as the M-COPE framework (Dennen and Hao 2014) and the FRAME model (Koole 2009). However, this literature review focuses on two prominent technology frameworks that provide guidance for general ICT integration; the TPACK framework (Koehler and Mishra 2006) and the SAMR framework (Puentedura 2009, 2006). The main focus is on the TPACK framework, a well established framework that gives a specific language to the integration of technology with pedagogy and content and therefore is the most useful framework for this research question. The SAMR framework provides an additional perspective that is particularly useful for evaluating the integration of iPads and identifying their impact on teaching and learning activities.

2.2.1 The TPACK framework

Mishra and Koehler of Michigan State University developed The TPACK framework in 2006. TPACK stands for Technological, Pedagogical, and Content Knowledge and it focuses on the interaction between these three concepts as they relate to teaching in a technology enhanced learning environment to "form an integrated whole, a 'Total PACKage'" (Thompson and Mishra 2008, p. 38). In total there are seven components of the TPACK Framework. A graphical representation of how TPACK's components fit together is shown in Figure 2.1.

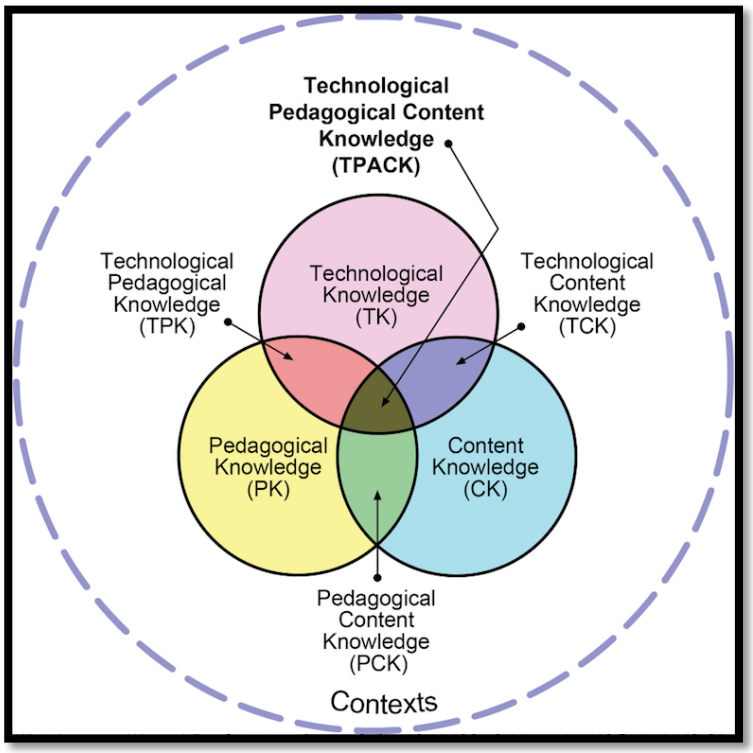


Figure 2.1: TPACK Framework
Reproduced by permission of the publisher, © 2012 by tpack.org

Firstly, there are the three main components of knowledge that guide teachers in planning lessons, their knowledge of 'what' to teach, 'how' to teach and 'which' technology to use. Mishra and Koehler (2006) define these as:

1. Content Knowledge (CK) - Knowledge of their subject matter.
2. Pedagogical Knowledge (PK) - Knowledge of the process and methods of teaching – including lesson planning, classroom management and assessment.
3. Technology Knowledge (TK) - Knowledge about various technologies, ranging from low-tech technologies to digital technologies.

Then the framework identifies three dyads where these components intersect:

4. Pedagogical Content Knowledge (PCK) - Knowledge that deals with the teaching process (Shulman, 1986). Pedagogical content knowledge is different for various content areas, as it blends both content and pedagogy with the goal to develop better teaching practices in the content areas.

5. Technological Content Knowledge (TCK) - Knowledge of how technology can create new representations for subject specific content.
6. Technological Pedagogical Knowledge (TPK) - Knowledge of how various technologies can be used in teaching such as tools for classroom management and assessment.

And ultimately the framework focuses on the triad where all components come together:

7. Technological Pedagogical Content Knowledge (TPACK) - Knowledge required by teachers for integrating technology into their teaching in any content area. Teachers, who have TPACK, act with an intuitive understanding of the complex interplay between all the components and interactions of content, pedagogy and technology knowledge.

Mishra and Koehler acknowledge that the concept of TPACK (2006) is an extension of Shulman's (1986) idea of pedagogical content knowledge (PCK), to which they added technological knowledge (TK). They described their framework, originally called TPCK and later renamed TPACK, by stating:

> TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones. (Mishra and Koehler 2006, p. 1029)

The TPACK framework is now considered to have entered a second generation with a focus on using it in both research and development projects (Thompson and Schmidt 2010). There has been extensive writing about the TPACK framework since it was first developed in 2006 (Mishra and Mehta, 2016; Hofer and Harris, 2015; Hofer & Grandgenett, 2012; Hofer and Harris 2011; Mishra, Koehler, and Henriksen, 2010; Thompson, and Schmidt, 2010). It has proven useful in helping teachers to make informed and creative choices in the use of technology in their

classrooms and has given researchers a framework for designing and developing programmes based on a more interconnected knowledge for teachers integrating technology into teaching (Olofson, Swallow and Neumann, 2016; Baran, Chuang and Thompson 2011; Schrum et al 2007). TPACK is not without its critics. The main criticism levelled at the framework is that it does not provide enough assistance to teachers to know what to do with it (Finger et al 2013; Dilworth et al 2012). It can be argued that the value of the TPACK Framework is that it makes pre-eminent the integration of a teacher's knowledge (Finger et al 2013). However, Dilworth et al (2012) suggest that many teachers do not understand the dynamic relationship between the three components of the framework and the TPACK framework does not close the gap between theory and practice. In spite of this weakness the TPACK framework does offer "researchers and educators a common language to bridge the gap between research and curriculum design (Jamieson-Proctor, 2013, p. 27).

The *National Digital Strategy* (DES 2015) also draws on the TPACK framework. However, the illustration contained in the strategy document (DES 2015, p.30) accidentally omitted the dotted line around the Venn diagram as seen in figure 2.1. This is unfortunate as the dotted line is an important part of the diagram as it represents the context in which everything else takes place. It is there as a reminder of all the variables that shape the situations in which teaching and learning take place. No two schools are the same and no two classes are the same and this must be taken into consideration. When planning for ICT integration we must take the available technologies' affordances and constraints, and the realities of unique school and classroom contexts into account and plan accordingly.

Hofer and Harris 2015 suggest that teachers can best develop TPACK during the process of designing their own lessons, units, and projects. They developed comprehensive taxonomies of Learning Activity Types (LATs) for a variety of US curriculum subjects to help integrate TPACK. There purpose is to assist teachers to design technologically enriched lessons, projects, and units. The taxonomies are divided into LATs that encourage knowledge development and knowledge expression. The research carried out with teachers using the LATs taxonomies during the planning process found that it helped them build their curriculum-specific technology integration knowledge (Hofer & Grandgenett, 2012; Hofer & Harris,

2010). Hofer and Harris (2015) offer a simple and straightforward five-step planning guide to help teachers. They advise teachers to always begin with choosing the learning goals and selecting the technology tools last. The other three steps, consider the classroom/school context, select activity types and select assessment strategies, can be planned in any order. This approach ensures that “technology use will be grounded in students’ curriculum based learning needs, rather than in the particular features of educational tools or resources” (Hofer and Harris 2015, p. 7-8).

Research on how TPACK informs educators' instructional planning also found that the teachers' selection and use of learning activities and technologies became more conscious, strategic, and varied and quality standards for technology integration were raised (Harris and Hofer 2011). Harris and Hofer devised four guiding questions for applying the TPACK framework and evaluating how it can inform and shape instructional planning. These are very useful for designing an integrated curriculum:

Pedagogical content knowledge: "How did you decide how to teach the content that this unit addresses?" "How, if at all, did these decisions change the content e.g., scope, depth, or nature of the content)?"

Technological pedagogical knowledge: "How did you decide which materials, tools, and resources to use to teach the content of the unit?" "How, if at all, did these decisions change your teaching (e.g., classroom management, assessment of student learning, or ways in which you interacted with the students)?"

Technological content knowledge: "How did the materials, tools, and resources that you used 'fit the content of the unit?" "How, if at all, did these decisions change the content (e.g., adding or subtracting unit sub-topics based on available resources)?"

Technological pedagogical content knowledge: "How and why was this particular combination of content, pedagogy, and technology most appropriate for this unit?"

(Harris and Hofer 2011)

The literature and research about the TPACK framework clearly show that successful technology integration begins with curriculum content and subject-specific pedagogy, and then with the value added use of educational technologies (Koehler and Mishra, 2009; Mishra and Koehler 2007). The SAMR Framework is a useful tool to evaluate how a planned ICT integration is progressing.

2.2.2 The SAMR framework

Developed by Puentedura (2009, 2006), the SAMR framework describes technology integration through four levels defined as follows:

1. Substitution: Technology is used as a direct substitute for what you might do already, with no functional change.
2. Augmentation: Technology is a direct substitute, but there is functional improvement over what you did without the technology.
3. Modification: Technology allows you to significantly redesign the task.
4. Redefinition: Technology allows you to do what was previously not possible.

While the first intuitive step for using any new technology in education is to substitute it for what you already do, the goal for a teacher in a 1:1 classroom is to move beyond the substitution and augmentation levels (Enhancement) and toward the modification and redefinition levels (Transformation). (See figure 2.2).

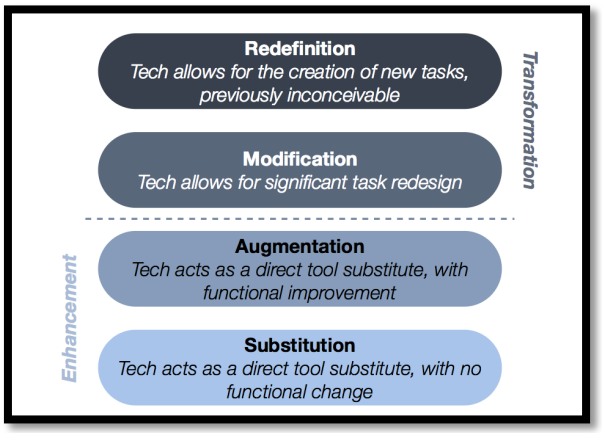


Figure 2.2: SAMR Framework Ruben R. Puentedura, 2009

The key to understanding the SAMR framework is that it is more about mindset than technical competency. Burvall (2014) suggested a simple way of remembering the levels with a rhyme she created that calls the levels ‘same same’ (substitution), ‘not

so lame' (augmentation), 'reframe' (modification) and 'change the game' (redefinition). The diagram for SAMR can be intimidating for teachers embarking on technology integration as it appears to indicate a progression of steps, like a ladder, that must be climbed. Building on the work of Puentedura, Hooker (2014, 2013) has developed a different approach to the SAMR framework. Instead of seeing it as a ladder the framework is re-imagined as a swimming pool (See figure 2.3). Hooker (2014, 2013) describes how it is natural that some people will dip their toes in the shallow end of the pool first, while others might dive right into the deep end, depending on their experience, confidence and skill.

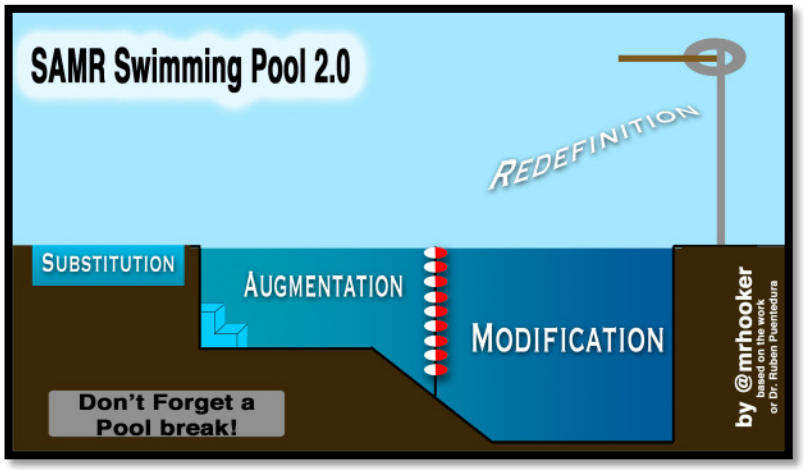


Figure 2.3: SAMR Swimming Pool 2.0

This perspective on Puentedura's work (2009, 2006) provides useful insight for the natural progression that can occur with technology integration and also reassures educators that the technology can and should be left aside for what Hooker describes as a 'pool break' (2014). The SAMR framework is a useful evaluation tool for the integration of technology and it can clearly challenge a teacher to try and move into the deep end when they are aware of the different levels that are possible. It can encourage teachers to begin to re-imagine how classroom activities could be modified or redefined. In order to do this successfully teachers need to develop their technology knowledge. The next section will look at the technology knowledge needed when integrating iPads.

2.3 Technology knowledge: integrating iPads

Embedding ICT in teaching, learning and assessment is a complex endeavour and using iPads for this is no exception. The iPad was not specifically invented for use in education, but it has become synonymous with it. This is not the first time that a device not originally intended for educational purposes were turned into a teaching and learning tool. Traxler (2010, p.4) describes this as education having a 'parasitic' relationship with technology, where devices originally intended for the corporate environment "continually challenge educationalists to develop educationally sound applications" for them. It is worth noting that previous attempts were often unsuccessful (Cuban 2015, 2002; Oppenheimer 2003). Therefore it is necessary to examine the specific affordances of iPads for education. These affordances are evident within the unique attributes of what is referred to in the literature as 'e-learning', 'm-learning' or 'u-learning'. 'E-learning', or 'electronic learning' is a term that covers all learning through digital technologies (Hwang and Tsai 2011). It has been happening in schools for a long time, although mainly through desktop devices. 'M-learning', or 'mobile learning', by its very nature, allows learning to take place anytime and anywhere (Hwang and Tsai 2011, Anderson 2010). A nuanced term, 'u-learning' or 'ubiquitous learning' emphasises the situated, contextualised learning that mobile devices enable over the mobility (Hwang and Tsai 2011), but m-learning and u-learning largely cover the same traits (Anderson 2010). Regardless of which term one prefers, introducing iPads in education allows for e-learning, m-learning or u-learning. What needs to be considered is what potential comes with this shift in technology.

The physical and social structural arrangements of classrooms were largely unchanged by the introduction of computers (Hartnett, Anderson and Brown 2014). It has been claimed that teaching and learning remains "largely untouched by the waves of digital technologies that have been introduced inside and outside the classroom over the last three decades" (Selwyn 2011, p.714). However new digital technology can give rise to potentially new and very different learning spaces if we are open to it.

Traxler (2010, p.5) makes an insightful comparison between desktop technology which takes place in a bubble – "in dedicated times and places where the user has his

or her back on the rest of the world for a substantial and probably premeditated episode" to mobile technology that is "woven into all times and places of students' lives". Melhuish and Falloon (2010) list five characteristics of m-learning that sets it apart from e-learning in education. These are 1) portability; 2) affordance and ubiquitous access; 3) situated, 'just-in-time' learning; 4) connection and convergence; 5) individualised and personalised experiences. The notion of the modern classroom has both expanded and evolved as the virtual space has increasingly taken its place alongside physical space (Brown 2005). Students can now learn on-site at scheduled times, on-site at unscheduled times, off-site at scheduled times and off-site at unscheduled times (Hartnett, Anderson and Brown 2014). Brown summaries this by stating "metaphorically speaking when the Internet enters the classroom the potential exists for students to leave it and learn at anytime from anywhere" (2015, p.44).

Taking on board this changing reality, Herrington et al. (2009) constructed the following design principles for teachers, instructional designers and educational developers to aid in planning and developing curriculum resources for mobile learning:

1. Real world relevance: Use mobile learning in authentic contexts.
2. Mobile contexts: Use mobile learning in contexts where learners are mobile.
3. Explore: Provide time for exploration of mobile technologies.
4. Blended: Blend mobile and non mobile technologies.
5. Whenever: Use mobile learning spontaneously.
6. Wherever: Use mobile learning in non-traditional learning spaces.
7. Whomsoever: Use mobile learning both individually and collaboratively.
8. Affordances: Exploit the affordances of mobile technologies.
9. Personalise: Employ the learners' own mobile devices
10. Mediation: Use mobile learning to mediate knowledge construction.
11. Prod*use*: Use mobile learning to produce and consume knowledge.

These guidelines for mobile learning were based on their research in higher education but the same principals are equally applicable at second level. The authors accept that not all of the principles will be relevant or necessary in all learning

contexts. The specific educational affordances of 1:1 technology allows for unique learning environments. I will now examine research that has been carried out in these environments.

2.3.1 Research on 1:1 technology in schools

The literature in relation to the use of iPads in education is still limited and lacks generalisability as there are such varied uses of them when integrated as well as many models of integration. Technology in general, and iPads specifically, have received criticism when used in education but research findings have been generally positive, while highlighting the importance of careful planning and preparation to maximise their potential. Melhuish and Falloon's (2010) study in New Zealand schools highlight the significance of innovative pedagogy and practice in order to utilise the advantages of the iPad. They emphasise the potential of iPads as a device for consuming and creating content collaboratively. They also emphasise the importance of seeing beyond the hype, and while their findings were generally positive and they identified many potential benefits, they clearly expressed the fact that "identifying and realising this potential are two totally different matters" (Melhuish and Falloon 2010, p.5).

While there are fears expressed about students loosing literacy skills when they become dependent on technology (Butler 2015), Sauers and McLeod (2011) outline research from the USA that shows an improvement in literacy after 1:1 iPad adoption. The most substantial results were evident with writing skills. Clarke and Svanaes' (2012) study across three UK schools found an increase in pupil-led learning, pupil-teacher communication and collaboration between pupils. Teachers described increased student motivation and found students were "more creative, independent and engaged with their schoolwork" (Clarke and Svanaes 2012, pp 46-47). However, a lack of appropriate educational content was identified as a challenge and it was noted that teachers had begun to respond to this by starting to create their own content, such as interactive iBooks (Clarke and Svanaes 2012).

A study in Western Australian schools, although small-scale and based in schools that were still in the experimental phase of adoption, found anecdotal evidence to support the literature around m-learning (Pegrum, Oakley and Faulkner 2013). The

schools in this study were still investigating the best way to integrate the iPads into an overall ecology of learning, but they found that that the devices themselves are less important than how they are used to support teaching and learning. They also identified the need for professional development opportunities for teachers (Pegrum, Oakley and Faulkner 2013). Research in Denmark on the integration of iPads for learning-centred processes concluded that the design of new forms of digital didactics enabled creativity, analysis, critical thinking, and reflection (Jahnke and Kumar 2014).

The most in-depth study in Ireland on the use of 1:1 technology in schools was carried out by the Association for Community and Comprehensive Schools (Hallissy et al. 2013). The research drew on a previous study by Galvin (2010) who investigated the use of 1:1 laptops in the CONNECT Project. He found the need for technology adoption to move beyond a technology-driven to a pedagogically led approach because "...technology alone is a mode of delivery and not a pedagogy" (Galvin, 2010, p.80). Galvin also found improved student engagement and in-class participation through the 1:1 programme. He credited this to the training that was provided to the teachers involved. Hallissy et al. 2013 acknowledged that while many of the schools they conducted their research with were only in the initial stages of 1:1 implementation the findings were positive, with schools reporting increased enthusiasm among students, higher levels of independent learning, and increased communication and collaboration among students. The study found that:

> The devices are currently being used primarily as eBook readers and in the main they wanted additional, subject-specific professional development on using the devices to transform student learning. (Hallissy et al. 2013, p5)

The recurring theme in the literature is the need for teacher training and professional development to support the successful integration of 1:1 technology.

Leading the way in research into iPads in Initial Teacher Education (ITE) is the School of Education in the National University of Ireland in Galway. The Dioplóma Gairmiúil san Oideachas (an Irish medium Professional Diploma in Education) for post-primary teachers is the first ITE programme to adopt 1:1 iPads. This decision

was motivated by the fact that Irish medium schools are to the forefront in adopting iPads for use by teachers and pupils (Mac Mahon, Ó Grádaigh and Ní Ghuidhir 2016). The limited choice and availability of Irish medium books is the driving force behind this. If publishers are not providing relevant resources, teachers are more likely to create their own and eBooks are proving popular platforms. A key element in this ITE programme is getting student teachers to use the iPads creatively. It centres on student teachers creating their own content, especially iBooks using *iBooks Author*. As the literature has shown the research to date has been mainly positive and indicates that further integration of 1:1 technology in schools is likely. However, the integration of ICT in education is not without its critics (Selwyn 2016; Butler 2015; Cuban 2015, 2002). It is therefore necessary to ascertain the general cautions and concerns found in the literature regarding ICT in education. I will begin by looking at the impact of ICT on student motivation and digital skills.

2.3.2. Considering the impact of ICT on motivation and digital skills

Motivation can be defined as "anything that encourages the student to learn". (Bennett and Rolheiser 2001, p. 83). Effective teachers try to establish a learning environment that encourages students to be intrinsically motivated while also applying extrinsic motivational factors. Bennett and Rolheiser (2001), drawing on literature dating back to 1897, identify six key characteristics of motivation:

- Success.
- Knowledge of results and feedback.
- Concern – which is influenced by increasing accountability, visibility, consequences, time and teacher or peer help available.
- Meaningful to the student – making links that are relevant to student experience.
- Positive feeling tone – creating a respectful learning environment.
- Interest – which can be increased with teacher enthusiasm, humour and generating curiosity.

Schools considering introducing new technology often talk about it engaging and motivating the students. However, it is not the technology that will engage them;

rather it depends on how the technology is used. Crevier (2012) argues that technology itself is not a motivator for students because:

> Technology is like socks for today's kids. It's something they just put on when they wake up and it doesn't really impress them. (2012)

On the other hand, he also points out that a lack of technology can be a de-motivator because technology is an expectation (Crevier 2012). Whether these expectations are met depends on how, why and when technology is used. As the research into digital fluency grows it is documenting the characteristics of those who spend extensive quality time navigating the Internet. According to Carr (2010) it is changing the way we read, think and remember. Tapscott (2009) found that a digital upbringing has changed the way people absorb information, noting that those who grew up with digital devices "don't necessarily read a page from left to right and from top to bottom. They might instead skip around, scanning for pertinent information of interest" (Tapscott 2009). The research in this area has found a number of other interesting characteristics of those who are digitally fluent indicating that: they prefer to receive information really fast; they engage with parallel processing and multitasking; they prefer to construct and discover learning rather than being told or lectured; they like to communicate and work in teams; they are more visually literate than any previous generation with a preference for image-rich rather than text-only environments, they spend significant time with images, video, sound, music, and animation, (Prensky 2012, 2001, Carr 2010, Tapscott 2008, Oblinger and Oblinger 2005). Drawing on this reality the DES is interested in developing ways to utilise these characteristics:

> Increasingly, young people are expert users of ICT and engage fluently and actively with the digital world in their everyday lives. They participate in online communities where they explore and share information and mediate their views and experiences within their peer groups. Essentially, they engage in informal learning across a continuum of digital activity in ingenious and impressive ways. We need to find ways of incorporating these new skills and experiences into the formal learning environment. (DES 2008, p 1)

However, it can be argued the level of technology use by students does not automatically transfer to educational skills. There is a growing body of empirical

research that discredits the validity of the simplistic dichotomy of digital natives and digital immigrants first coined by Prensky in 2001 (Bennett and Mahon 2010; Oblinger and Oblinger 2005). The initial DES approach seemed to assume that all young people have digital skills but this is an over-simplification of the situation. The more nuanced approach to digital skills in the new Junior Cycle Framework (DES 2015) is more suited to meeting students where they are and actively developing these skills rather than assuming they have them. Having considered some assumptions about motivation and digital skills I will now look further into criticisms of ICT in education.

2.3.3 Digital distraction

The traditional digital divide that was a question of having or not having access to technology is no longer the prevalent issue. With widespread access to technology the nuanced reality is the digital use divide. How we can and should use the technology available to us in education is an important question. However there are many criticisms and concerns that raise the question if we should use it at all. In *Oversold and Underused* (2002), Cuban subjected the use of ICT in education to critical analysis. As the title of his book indicates he argues that ICT fails to deliver on its promises to improve both the pedagogical process and learning outcomes in education. More recently he has commented:

> Since 2010, laptops, tablets, interactive whiteboards, smart phones, and a cornucopia of software have become ubiquitous. Yet has academic achievement improved as a consequence? Has teaching and learning changed? Has use of devices in schools led to better jobs? These are the basic questions that school boards, policymakers, and administrators ask. The answers to these questions are 'no,' 'no,' and 'probably not'. (Cuban 2015)

He is just one of many voices who have concerns about the widespread and fast paced adoption of technology in education. Professor Tom Butler from University College Cork also made headlines after giving a talk at Féilte (October 2015) where he stated, '*Books are Better than Screens*' (Gartland 2015). Butler quoted Selwyn (2015, p.247) who said that "digital technology is hardly the benign, neutral presence in education that we are often assured it to be".

Digital technology is not a neutral presence in education. Bring any device, digital or otherwise into a classroom, and it won't be a neutral presence. Likewise, bring any person into the classroom and the dynamics change. It is not neutral, but neither is it automatically good or bad. There are far too many variables at play to make a statement like that. Selwyn a well-regarded critic of technology in education argues that a big part of the problem is the language that we use. He believes that the language used is neither benign nor neutral (Selwyn 2016). He accuses it of having traits similar to language used in political speeches, real estate or advertising, infused with language that is 'opaque, obtuse and often self-serving' (Selwyn 2016 p.2). This 'ed-vertising' language is evident in a lot of hyped-up articles on educational technology that describe game changing 21st century tools for the future.

It is imperative to discuss the positives and negatives and be aware that the presence of technology has little impact, but how it is used makes a difference. Butler in the introduction to a paper entitled *ICT in Education: fundamental problems and practical recommendations* raises some valid concerns about the effect of ICT on the brain stating that "the negative effects of ICT use include sleep deprivation, distraction and multitasking, all of which directly impact on learning" (Butler 2015). Research has shown that the human brain cannot successfully perform two or more cognitive tasks simultaneously. It can only alternate tasks and sequence tasks and doing so hinders our progress (Sousa 2011). In other words, our ability to multitask is a myth. It seems young people, and a lot of adults, need to be made aware of the possible negative effects of technology and need to acquire the skills to manage and minimise these for themselves.

According to Powers (2010) in these early years of the digital era, without realising it, we are living with a philosophy of technology that tells us that it is good to be connected, and it's bad to be disconnected. He proposes that digital connectedness serves us best when it is balanced with disconnectedness (Powers 2010). With students armed with iPads, how much connection are they expecting to have with teachers on their devices? More importantly, how does the teacher make sure to balance their own disconnectedness when teaching with iPads? How can teachers model good practice for their students? It is imperative for teachers to consider if and

how they foster connections with their students online in a 1:1 classroom and how that online connection will impact their real world connection.

Protalinski reports that the main social media platform being used is Facebook (2016). As of April 2016 Facebook has over 1.5 billion monthly active users, of which of over 1 billion are reported to be daily users (Protalinski 2016) If our underlying philosophy of technology is connectedness (Powers 2010) then we need to call into question the type of 'connectedness' Facebook provides. According to Smith (2010) Facebook aims to connect people at all costs and warns of the unbalanced nature she feels is found in the approach of Facebook founder Zuckerberg:

> Zuckerberg uses the word "connect" as believers use the word "Jesus," as if it were sacred in and of itself: Connection is the goal. The quality of that connection, the quality of the information that passes through it, the quality of the relationship that connection permits—none of this is important. That a lot of social networking software explicitly encourages people to make weak, superficial connections with each other (as Malcolm Gladwell has recently argued), and that this might not be an entirely positive thing, seem to never have occurred to him. (Smith 2010)

Turkle argues that individuals are drawn to life online because 'the connections seem low risk and always at hand' (2011, p295) and concludes that what appears to be a connected life can actually disconnect people from engaging in real relationships. The negative impact of mindlessly wandering into the world of technology and social media without critically reflecting on its impact on our lives is clear. Therefore, the teacher in a 1:1 environment needs to be open to on-going questioning and reflection on their own use of technology. It is important to be aware of the criticisms and concerns explored in the literature before embarking on technology integration. However, technology is only aspect of the research question that needs to be explored. Reflecting on pedagogical knowledge for 21st century teaching is essential as the pedagogical practice of the teacher will determine the use of the technology.

2.4 Pedagogical knowledge: 21st century teaching and learning

Pedagogy is a collective term that refers to instructional knowledge, skills and strategies that facilitate student learning. Dewey (1956) described pedagogy as building a bridge between the world of the student and the intellectual and the cultural life of the community. The traditional model of pedagogy, which could be summed up as the 'sage on the stage' approach makes no sense to young people who have grown up in a digital world. Learners today need more opportunities to develop higher-order thinking, creativity, independence, collaboration skills and ownership of learning (DES 2012, p.20). There has been a shift that has seen teachers try to become a 'guide on the side' instead. McWilliam offers another approach that she describes as 'meddlers in the middle' (2012). This involves teachers steeping down from the front giving instructions and more time spent being a "usefully ignorant team member in the thick of the action" (McWilliam 2012). What then should twenty first century pedagogy look like?

The first key principle of the *National Digital Strategy* says that a constructivist pedagogical orientation underpins the embedding of ICT in schools because this pedagogical approach allows learners to determine meaning and knowledge for themselves (DES 2015, p. 8). Constructivism is a theory of learning that centres on the student's own knowledge, experience and perspective as a starting point. It then depends on the students being active learners rather than passive recipients of knowledge. Bruner emphasises the importance of teaching students to participate in the process of knowledge construction arguing that knowledge is a "process not a product" Bruner (1966, p 72). Bruner's Spiral Curriculum (1966) highlights the importance of building upon prior knowledge by revisiting concepts a number of times. Vygotsky's (1978) work on social constructivism is based on the belief that social interaction plays a fundamental role in the development of cognition. According to this theory learning depends on the interactions that take place in the student's Zone of Proximal Development (ZPD). The ZPD is the distance between the level of current development, measured by the student's ability to solve problems without assistance, and the level of potential development measured by the student's ability to solve problems with guidance or peer collaboration (Vygotsky 1978). The students' knowledge is actively constructed from their prior personal experience and interpretations of the world through their social interaction. As a result a learner can

contextualise information within their own unique personal context that can be applied as constructed personalised knowledge within practical real-world situations (Vygotsky 1978).

The blending of technological and pedagogical considerations allows an educator to anchor learning in real-world or authentic contexts that make learning meaningful and purposeful (Bonk and Cunningham, 1998). A constructivist pedagogical approach aligns with this. The religious educator Grimmitt views knowledge as 'socially constructed, socially related and socially relative' (1983, p.20). A social constructivist learning theory is appropriate for RE subject specific content as it reflects the personal, experiential and communal essence of RE. Within the social constructivist paradigm collaborative work is vital (Bertrand, 2003). It is also an appropriate choice for integrating technology because social constructivists emphasise dialogue, interaction, negotiation, and collaboration, all of which can be facilitated by technology.

Drawing on the literature on social constructivism Bonk and Cunningham (1998) outline useful guiding teaching practices and principles for curriculum design within this paradigm. These include:

- Build on individual student prior knowledge as well as on common interests and experiences.
- Use activities with choice, novelty and personal interest.
- Encourage group as well as individual reflection on experiences.
- Provide teacher explanation, support and clarification where needed.
- Foster student collaboration and negotiation of meaning.
- Create a learning community where students have ownership of learning.
- Assessment is less formal with a focus on real world tasks, collaboration and sharing of findings.

From the literature reviewed it is evident that a social constructivist pedagogical approach is suitable for 21st century teaching and learning. As the *National Digital Strategy* indicates this approach supports teachers in effectively using ICT with their

students. It also facilitates the move from teachers as the 'sage on the stage' to becoming 'meddlers in the middle' (McWilliam 2012). Ultimately it ensures students are actively involved in constructing knowledge and meaning for themselves. This construction of knowledge and meaning depends on the students utilising a range of skills which I will now examine.

2.4.1 21st century skills

An abundance of literature has been published with regard to 21st century skills. The focus on 21st century skills is an educational trend that is evident at national and international levels. The Partnership for 21st Century Skills (P21) identified four essential key skills that need to be part of teaching and learning today namely: critical thinking, communication, collaboration, and creativity. Updated in 2015 to the Partnership for 21st Century Learning, the original skills, commonly known as the four C's, are evident in other 21st century frameworks. The UNESCO ICT Competency Framework for Teachers (2011) and the European Commission's Assessment of Transversal Skills (ATS2020) all elaborate and expand on these skills. The ATS2020 Competences and Skills framework focus on four main areas: Information Literacy, Collaboration and Communication, Autonomous Learning, Creativity and Innovation. The *Junior Cycle Framework* incorporates the ATS2020 skills (Junior Cycle for Teachers (JCT) 2017; DES 2015).

The importance of these skills in preparing students for a changing world put collaboration and creativity at the centre. Mishra and Mehta (2016) highlight the risk of these skills unnecessarily overshadowing some traditional aspects of education that are still essential. Kereluik et al. (2013) analysed fifteen key documents from the literature on 21st-century knowledge frameworks and suggest a broader framework than the four C's, known as the 'three times three' model. The three main categories are Foundational Knowledge (to know), Meta Knowledge (to act) and Humanistic Knowledge (to value). Each category is divided into three further sub-categories. Digital/ICT literacy is found within the Foundational Knowledge category along with core content and cross-disciplinary knowledge. Humanistic Knowledge is made up of life/job skills, ethical/emotional awareness and cultural competence. Finally Meta Knowledge is divided into creativity and innovation, problem-solving and critical thinking and communication and collaboration. (See Appendix C for an

illustration of this framework). Mishra and Mehta (2016) conducted research with teachers on the 'three times three' model and found that meta knowledge categories (which broadly align with the 4 Cs) are regarded as being the most important for 21st-century learning. They expressed concern with these results concluding that:

> "The implication that in a world saturated with information (via ICT) facts and memorization are no longer important is narrow, and in fact, an incorrect understanding of what it means to learn" (Mishra and Mehta, 2016, p. 13).

It is worth being mindful of what Mishra and Mehta refer to as the myths that undermine education today. First of all, information does not equate to knowledge. With the widespread adoption of technology in education extreme views have emerged. One proponent of an alternative outlook, Sugata Mitra (2013, 2007) argues that students no longer need teachers to learn, insisting they only need each other and an Internet connection. While technology can give instant access to information Mishra and Mehta (2016) counter-argue that teachers are needed to put content into context as well as bringing together pedagogy and technology to facilitate experiences that allow for the transformation of information into knowledge. Mitra is quoted as saying, "If knowing becomes obsolete I think it'll leave us with space for something that is perhaps more important, which is creating" (Stinson, 2015).

Robinson states that "creativity is as important now in education as literacy and we should treat it with the same status" (2006). Creativity is not a replacement for a focus on knowledge in education. Furthermore, research indicates that creativity cannot be content neutral (Mishra and Mehta 2016) and often requires inter-disciplinary knowledge (Mishra, Koehler, & Henriksen, 2010). Seeking to balance a creative and collaborative curriculum without neglecting the foundational and humanistic aspects of 21st century learning is of paramount importance in finding a way forward. Bloom's taxonomy can offer a useful insight into planning balanced lessons.

2.4.2 Bloom's taxonomy; revised, digitised and flipped

Bloom's Taxonomy (1956), a multi-tiered model of classifying thinking according to six cognitive levels of complexity was revised for the 21st century classroom (Anderson and Krathwohl 2001). The original levels were: knowledge,

comprehension, application, analysis, synthesis and evaluation. Bloom's revised taxonomy added 'create' as the top tier and the levels were renamed as action words, emphasising that they are actions one takes to think in different ways (Krathwohl 2002). Synthesis no longer appears as a heading but it is not regarded as the same as creativity as one can be creative and not be engaged in synthesis (Bennett and Rolheiser 2001).

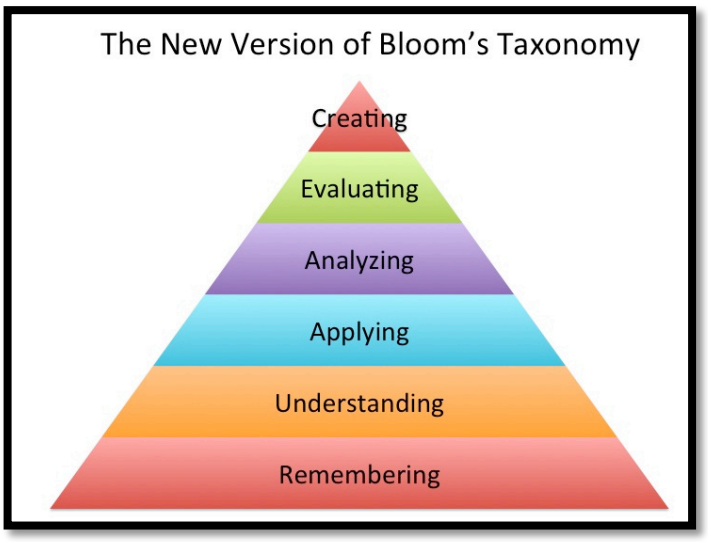


Figure 2.4: Bloom's Revised Taxonomy

It is interesting to see create on the pyramid in what some might see as the coveted top spot, but Shelley Wright made a useful observation:

> I dislike the pyramid because it creates the impression that there is *a scarcity of creativity* — only those who can traverse the bottom levels and reach the summit can be creative. (Wright 2012)

She proposes that we flip Bloom. In a similar way to seeing the SAMR model as a swimming pool rather than a ladder, flipping Bloom gives a useful new perspective. Rather than starting with knowledge, can we start with creating, and eventually discern the knowledge that we need from it? This seems very fitting for the twenty first century where we 'flip' our classrooms (Bergmann and Sams 2012). A flipped classroom normally involves a teacher assigning a video for homework that introduces the content for the next class, allowing class time be used for active learning rather than content transmission. In fact the main reason to flip a classroom

is to allow more time for creative work in class. For educators to successfully move students away from being consumers of content to becoming creators of content, then instead of seeing 'creating' as an add-on that comes after they have done everything else, this encourages 'creating' to be embedded in new ways, even as a starting point as seen in figure 2.5.

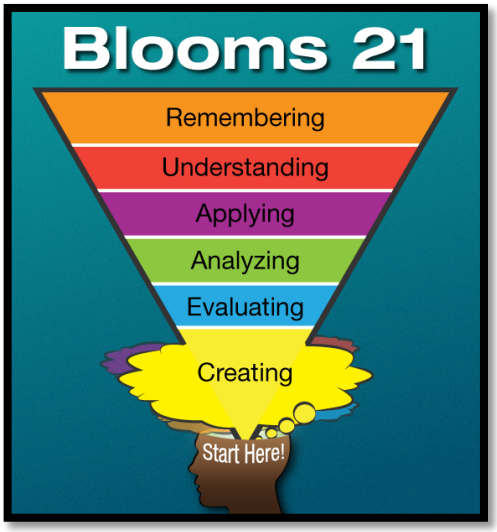


Figure 2.5: Chris Davis, Powerful Learning Practice LLC

Churches points out that Bloom's Revised Taxonomy (Anderson and Krathwohl 2001) describes many traditional classroom practices but:

> Does not account for the new processes and actions associated with Web 2.0 technologies, infowhelm (the exponential growth in information), increasing ubiquitous personal technologies or cloud computing. (Churches 2008)

In response to this void he has developed Bloom's digital taxonomy (Churches 2008). Churches highlights the importance of collaboration as a central aspect to his application of Bloom's taxonomy (2008). In fact he argues that collaboration is more than a twenty first century skill, it is an 'essential'. He also offers practical guides and rubrics to help implement the taxonomy. Having well thought out rubrics, and more specifically well planned assessment is an essential aspect of curriculum planning which I will now consider before moving on to integrating technological and pedagogical knowledge.

2.4.3 Aligning effective assessment

Assessment is an integral part of the educational process and effective teaching includes effective assessment. Assessment should help equip students with a wide range of transferable skills and competencies. Williams (2013) identified five key strategies for formative assessment; setting learning intentions, eliciting evidence, feedback, students as learning resources for one another and students owning their own learning. Williams' strategies come with a warning that "well-intentioned attempts to communicate learning intentions to students have made writing a mechanistic process of checklist management" (2013, p.16). The National Council for Curriculum and Assessment (NCCA) guidelines regarding learning intentions and success criteria are based on the work of Williams and provide useful examples of how to apply these guidelines with junior cycle students (NCCA 2015). Constructive Alignment is a theory of learning that begins with the premise that the learner constructs his or her own learning through relevant learning activities (Biggs, 1999). In practice this theory means that the curriculum aims and learning outcomes, pedagogy, resources and assessment activities and criteria for evaluating it, are all aligned. In an integrated classroom technology needs to be aligned to all of these. I will now discuss the importance of technological pedagogical knowledge for adapting to teaching in a 1:1 iPad environment.

2.5 Technological pedagogical knowledge: adapting for a 1:1 classroom

The *UNESCO ICT Competency Framework for Teachers* (2011) states that teachers need to use teaching methods that are appropriate for 'evolving knowledge societies' and elaborates on this by saying that as well as gaining knowledge in their school subjects students need to be enabled to understand how they themselves can generate new knowledge, using technology as a tool. The framework is under no illusions that this requires a shift in teaching and learning as it outlines the challenge that lies ahead.

> The successful integration of ICT into the classroom will depend on the ability of teachers to structure the learning environment in new ways, to merge new technology with a new pedagogy, to develop socially active classrooms, encouraging co-operative interaction, collaborative learning and group work. This requires a different set of classroom management skills. (UNESCO 2011, p8)

The UNESCO *ICT Competency Framework* (2011) acknowledges that it will take time for teachers to understand these new approaches to teaching and calls on strong leadership from all stakeholders in education to support teachers in this change. Research indicates that a teacher's pedagogical orientation is a principal factor in how he/she will use digital technology in the classroom (OECD 2015, Butler et al. 2013). It is also evident that the introduction of technology will not necessarily impact pedagogical practice (Butler et al. 2013; Mcloughlin and Lee 2008). Mcloughlin and Lee point out that:

> It must be recognised that technology is not of itself the sole driver of pedagogical change. Technological resources provide opportunities for a range of interactions, communicative exchanges, and sharing, but it is not possible to base an entire sequence of learning episodes solely on tools. (Mcloughlin and Lee 2008)

Many of the failures in successful technology integration are a failure to make the links between the technology tools and their specific pedagogical affordances. It is vital for educators to make informed decisions about what technology tools support the learning outcomes and planned activities in a lesson. It is easy to get overwhelmed in the midst of researching copious apps and their potential uses. The list seems never-ending as streams of new apps are regularly released and old ones are updated. To help make informed technology choices Donlon's Project 252 (2015), provides a crowd sourced alphabetical list of educational technology. It covers a large range of technology tools with clear descriptions of what each one can do and what platforms each are suited to. It is important to remember that every app is limited. Kulowiec (2013) encourages educators to consider 'app smashing', which is "the process of using multiple apps in conjunction with one another to complete a final task or project". Carrington's 'Padagogy Wheel' (2015) is a useful guide to help select appropriate apps for a variety of activities when planning integrated lessons. The Padagogy Wheel visual attempts to clarify the relationship between apps, the cognitive actions from Bloom's taxonomy and the technology considerations of the SAMR framework (See Appendix E). Seeing how the various elements from thinking to technology can blend together offers a practical tool for developing 'technological pedagogical knowledge' for a 1:1 classroom. However, while the vast array of technology tools can provide inspiration, successful

integration can only come when informed choices are being made. These informed choices depend on asking the right questions.

2.5.1 Asking the right questions

It would be interesting to know how many teachers are using iPads to deliver exciting integrated 21st century transformational lessons. The reality for many schools that adopt iPads is that they are simply reduced to being used as eReaders. The problem often lies in how iPads are introduced - teachers come in for a day of training and learn how to use the tool, but this is not done in context. Technology can help us see new ways of doing things but only if we see technology in the right way. Hannam and Ashcroft who run LearnMaker, a UK company that helps schools integrate technology, found in their experience that the key problem with technology deployment was schools asking the wrong questions. They were focused on asking *what* instead of *how*.

In their blog post entitled *iPad Apps vs. iPad Pedagogy* (Hannam and Ashcroft, LearnMaker 2015) the authors encourage teachers to draw on the TPACK framework (Mishra and Koehler 2006) to change the questions they are starting with. They concluded that 'only by mastering pedagogy can you truly master the technology' (Hannam and Ashcroft, LearnMaker 2015). The transition from the '*what*' questions to the '*how'* questions as outlined by Hannam and Ashcroft (2015) is a first step in bringing about an important mind-shift towards technology use. Ferriter (2013) provides further insight with an alternative guiding question. He advises educators to ask "what do you want kids to do with technology?"

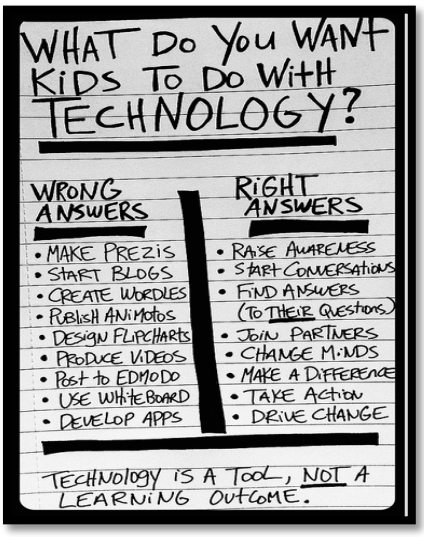


Figure 2.6: What Do You Want Kids to Do With Technology?

Ferriter's answers as outlined in figure 2.6 encourages educators to look toward the bigger picture as he wants to see technology being used to raise awareness and drive change. It is a reminder to carefully think through what students should know and be able to do when making choices about the role that technology plays in teaching. Mirroring Crevier's (2012) argument that students aren't motivated by technology Ferriter goes on to argue that they are motivated by opportunities to make a difference in the world and explains that technology can play a unique role in achieving this (Ferriter 2013). Other motivating factors for students that technology can facilitate are collaboration and content creation which I will now explore.

2.5.2 Collaborating and creating content

The Horizon Report, one of the most respected annual indicators of emerging technologies for education, predicts the impact of adoption of certain technologies across three horizons – near, medium and long term (Johnson et al. 2015). In the 2015 report the short-term impacts identified were an increase in blended learning and the rise of Science, Technology, Engineering, the Arts and Mathematics (STEAM) learning. The long-term impacts predicted were rethinking how schools work and a shift to deeper learning approaches. Most relevant to note is that the use of collaborative learning approaches and a shift from students as consumers to creators were identified as the two medium term trends. (See appendix D for an illustration of the report).

If content creation is the aim, the good news is that it is easier than ever for teachers and their students to be digital content creators with numerous free platforms available to create and share blogs, podcasts, videos, eBooks, etc. The advantage of using digital technology for content creation is that student work can be published online. This can help students to produce quality work by giving them an authentic audience. Even knowing that they are sharing their work with other classes or each other can increase motivation to produce quality work.

While a student may be able to find everything they need online when creating content, the ability to search and find what is needed is a skill that needs to be taught and practiced. This skill is an important part of developing students' digital literacy. The NCCA's short course on Digital Media Literacy explains digital literacy as follows:

> In studying digital media, students learn to use digital technology, communication tools and the Internet to engage in self-directed enquiry. As students develop their digital literacy skills, they improve their capacity to know what they are looking for, what information to ignore or discard, and how to identify what can be useful or significant. They learn to discriminate between the multiple sources of information available online and to challenge the views they find there. They learn how to create, collaborate and communicate effectively and ethically. (NCCA 2013, p.6)

The issue of ethics, specifically copyright, can be a challenge for content creation. However, understanding this challenge is another essential life skill for 21st century learners. With so many potential skills to develop, and challenges to overcome in content creation, it is advantageous to have students collaborate. Digital technology can facilitate effective collaboration through a range of apps and websites. Within a digitised classroom the collaboration can reach far beyond the classroom walls. The use of digital technologies empowers educators to take content creation and collaboration to a whole new level, both for themselves and their students.

The area of cooperative or collaborative learning is well researched. Certainly facilitating effective collaborative learning is complex. However the research indicates that social interaction is an essential element in the development of knowledge, creativity and learning styles (Bennett and Rolheiser 2001;

Csikszentmihalyi, 1997; Gardner, 1993; Vygotsky 1978). There are a wide variety of approaches available. Bennett and Rolheiser (2001) acknowledge that an effective teacher has the ability to integrate and stack these approaches suggesting that strategies like 'think-pair-share' are established before more complex strategies are introduced. When ICT is used effectively it can facilitate this style of teaching and learning. Platforms like *Google Drive* allow for shared folders and shared documents that can be worked on by multiple users at the same time. Technology gives added value to collaborative projects as students can work together from different locations. It is clear that the integration of technology and pedagogy has educational benefits. How then can the third aspect of the research question be integrated with these? The next section will begin to answer this question.

2.6 Content knowledge: rooted, relevant and responsive RE

The literature regarding technological and pedagogical knowledge has been addressed. The subject specific content considerations for RE will now be explored. As Schrum et al. highlighted:

> Different technologies do have unique pedagogical affordances and that the effects of these affordances can only be understood in the context of a specific content area (and related learning outcomes) and a specific pedagogy (2007, p.3).

RE is without doubt a unique subject. The Irish Catholic Bishops in the National Directory for Catechesis in Ireland, *Share the Good News* (SGN) highlight that the "study of religion in class can be both intellectually challenging and personally stimulating" (SGN, 107). It is the blend of potential impact on the head, heart and hands or what is more formally referred to as information, formation and transformation that make this subject special. As well as teaching an academic subject RE teachers are potentially involved in fostering faith and seeing this lead to action. In the context of pluralist Ireland today RE needs to be rooted, responsive and relevant to the current landscape. Content knowledge therefore not only includes an awareness of the RE syllabus as outlined in chapter one, but it is imperative to look at content in light of the influence of contemporary culture.

Many adolescents today have little experience of committed faith and religious practice compared to previous generations. In light of this Byrne (2017) concludes that the role of RE in schools is more important than ever as it gives the majority of young people their only opportunity to consider how religious, spiritual and moral questions impact on them. This opportunity to reflect on these topics is as relevant as ever. The *Junior Certificate RE Syllabus* (JCRES) clearly states that one of its aims is the 'spiritual and moral development of students' (DES 2000). The new *Framework for Junior Cycle* includes an "awareness of personal values and an understanding of the process of moral decision-making" (DES 2015) as one of its twenty-four learning statements. Many young people today describe themselves as being more spiritual than religious. Byrne (2004) acknowledges that spirituality can be a difficult term to define, but says it can be generally understood as "a consciousness at the core of each individual's being, affecting the way a person lives life." Lane (2008) speaks about this new trend in people emphasising their spirituality as a common movement in Irish society today. He feels that this increasing turn towards spirituality poses a new challenge for RE suggesting that if this turn to spirituality is not addressed explicitly in RE, it will become increasingly empty and disconnected from religious traditions (Lane 2008).

Many people underestimate the impact that RE can have on teenagers but Meehan points out that "the spontaneous Spirit of God is equally at home in the awkward, the giddy, the sullen, the world of iPods and iPads" (2012, p.19). She asks the reader to think not only of the aspects of young people that are the clichéd notions that we have come to know, but to consider the questions of faith, spirituality and beliefs that young people may want to explore. RE gives students the opportunity to look at a variety of cultures and faiths and consider the impact it may have on their own lives. She outlines the benefits of RE as part of a more holistic approach to education and linking to personal well-being (Meehan 2012). Students can feel a sense of belonging in the study of their own faith communities, as well as gaining wisdom and knowledge about different faiths that will foster a respect that will continue into their adult life.

The move towards spirituality is a great opportunity for RE. Groome (1999) explains that religion and spirituality are two sides of the same coin and they badly need each

other. If students are to consider everyday experiences and issues that matter to them in the study of RE this allows for spiritual wisdom to be brought back to their own lives. Groome's belief is that embracing spirituality in RE can have a positive impact on their study in all subjects and believes that "our scientific knowledge, and especially our technical knowledge, if not accompanied with spiritual wisdom, is likely to destroy us" (1999, p.165). The heart of RE is encountered especially in response to the great questions of life, what is, could be and should be (Groome 1999).

The sense of searching and wondering are universal. Journeys to sacred places can be traced back to the Stone Age, when megalithic sites like Newgrange were built. The design of Newgrange is still marvelled at by those who visit it today but what is even more remarkable is that journeys to sacred places are still as popular as ever in this digital age. However, going on pilgrimage is much more than an opportunity for a digital detox. As Drumm (1997) says a pilgrimage can strengthen our sense of fellowship, broaden our perception of things, deepen our awareness of mystery, renew our identity and heal our wounds. The peaceful atmosphere of sacred places appeal to people from all faiths and none, as people can tap into their innate sense of spirituality and sacredness that can, for some, be separate from organised religion. The JCRES (DES 2000) explores pilgrimage from the perspective of different world religions and outlines a variety of religious rituals and practices that can accompany a pilgrimage such as prayer, fasting and almsgiving. Howell notes:

> To seek out shrines, temples of yore, burial grounds of saints, places made immortal by heroic vigil is to acknowledge life as a spiritual journey. Caught in the human condition of infinite desires meeting seemingly finite capacities, we want to know what saints know. The education that pilgrimages offer is far less factual than experiential. (Howell 2013)

This shift from the factual to the experiential, as well as the wide appeal of pilgrimage, can tap into the universal human search for meaning making this a unique topic to teach from the JCRES. It is rooted in the long tradition of religious practice, it responds to the innate sense of searching within people and it is relevant to young people today as large numbers embark on spiritual pilgrimages such as the Camino de Santiago.

2.7 Pedagogical content knowledge: a space like no other

RE is regarded as a unique subject as it offers a "space like no other" that "calls for a unique blend of pedagogical qualities and skills (Sullivan 2017, p7). A specialised approach is required due to the sensibilities of the subject matter that can include topics that do not necessarily have one right answer but rather need to recognise and include a variety of world views. Watson (2012) suggests that RE can help society deal with diversity by providing an open and safe space for expressing disagreement based on understanding not ignorance. Dillon points out that:

> Inclusive practice in Religious Education is not just about the methodology or strategies used; it is about the hearts and minds, the values and understandings, which underpin those strategies. (2013, p.72)

Torvell argues that being vulnerable and open to sharing doubts is essential for RE teachers with the ultimate goal being able to enter into a common search with students. RE teaching requires an environment in which the "validity of the questions does not depend on the availability of the answers, but on the capacity to open us to new perspectives and horizons" (Torvell 2017, p.66). The challenge as noted by Groome (2017) is to find a pedagogy that can appeal to hearts as well as to heads.

2.7.1 A 'life to faith to life' approach to RE

With this in mind, Thomas Groome developed his Shared Christian Praxis or Shared Praxis approach to RE (1991). Groome more recently has summed this up as the 'Life to Faith to Life' approach (Groome 2017, 2011). This approach can be considered as a paradigmatic method for RE or a meta-methodology. It seeks to maintain the dialogue between religious tradition as a dynamic entity and human experience. This pedagogical approach to RE facilitates the integration of information and formation and transformation. Groome calls Shared Praxis an 'approach' because it is neither a theory nor method exclusively; rather it is a 'way of being with people' (1991). Groome acknowledges that the biggest inspiration behind this approach is the pedagogy of Jesus. Jesus' intent was to integrate life and faith into living faith or as Corkery notes Jesus as a teacher was concerned with "transforming his audiences' attitudes, behaviour and way of being in the world" (2017, p. 254). Groome's work has been recognised as a support for those who

advocate learning both 'about' and 'from' religion as he clearly states the intention of the approach to move students beyond 'learning about', to 'learning from', a religious tradition (Groome 2005) .

Shared Praxis is a five-movement approach centred on a 'generative theme'. It begins with a focusing act that introduces the topic in an engaging way that is tied to the participants' interests or raising a life-centred theme for the participants. This is then followed by the five movements. Speaking at the *Mater Dei Centre for Catholic Education* (2017) Groome summarised the movements as:

Life	• M1: Invite expression from praxis/experience around theme. • M.2: Encourage reflection and conversation (reason, memory, imagination).
Faith	• M3: Persuasive access (reason and desire) to story/vision of faith tradition for theme, group, context.
Life	• M4: Encourage people's appropriation, integration, seeing for themselves. • M5: Invite decisions – at least learn *from* its spiritual wisdom; dispose to choose as identity.

Table 2.1: A Life to Faith to Life Approach to RE

The pedagogical commitments that underpin the movements allow Shared Praxis to unfold as a communal process of conversation that engages participants as active learners and contributors to the curriculum. The dynamic of personal appropriation by the student helps prevent the teacher from proselytising for a particular outcome; it gives a real freedom for students to 'see for themselves' whatever they see, and to say so.

Shared Praxis has had a major influence on RE around the world and while for many this is a welcome and positive influence, it is not without critics. Groome encourages students to bring their own 'stories' (i.e., their own questions and experiences) into dialogue with the Christian story to appropriate it on their own terms. Groome was accused of designing a process that encouraged students to pick and choose the aspects of Christianity that they find personally congenial. However, this is not what Groome intended. Groome is echoing the insight of the early Church's great

pedagogues that said in order for students to truly understand the Gospel they must claim it for their own. As argued in *The General Directory for Catechesis* (1998) "the recipient [of education] must be an active subject, conscious and co-responsible, and not merely a silent and passive recipient".

Another area of concern arises from the word 'Christian' in the original title to this approach. For many this means that Shared Christian Praxis works as an approach to contemporary catechesis but doesn't fit into the broader picture of RE. In Catholic schools around the world, and in particular in Ireland, teaching world religions and catering for students that are not Catholic is essential, so people question if this approach is useful or even appropriate. However, Groome clarified an intended broader and flexible approach to the pedagogy stating that it can be used as a 'shared Christian or Buddhist or Jewish or whatever-praxis approach (Groome 2005).

By its very nature, the study of any world religion demands more than knowing about it and even goes further than understanding it to 'appropriate' its wisdom for our lives. He elaborates on this by stating:

> It is better to approach and present religion for what it is: a tradition of spiritual wisdom that can help students to realise themselves as spiritual beings with responsibility for their own and others' welfare (Groome 2005).

This approach has been used with students of all faiths and none, allowing them to start from a personal life perspective and reflect on what they hear for their own lives. Speaking in *Boston College* Groome (2011) advised that this approach should be used gently, and held loosely by the teacher stating that the process is meant for the students, not the students for the process. This student-centred approach should always be at the heart of pedagogy in RE. It is also wise to remember the same advice when integrating technology.

2.8 Technological content knowledge: ICT and RE

Effective RE must acknowledge the context within which it takes place. It requires dialogue with the culture in which students grow and by which they are shaped. The Second Vatican Council document on education, *Gravissimum educationis*, states that everyone has an inalienable right to education and that:

> This education should be suitable to the particular destiny of the individuals, adapted to their ability, sex and national culture traditions. (Vatican II 1965).

It is evident that an education that suits the culture and ability of young people today will include digital technology. The National Directory for Catechesis in Ireland, *Share the Good News*, affirms the need for religious educators to engage with modern forms of communication and to be aware of the contexts and ways in which young people meet, interact and chat (Irish Episcopal Conference 2010). The use of technology in RE offers religious educators the opportunity to engage in a dialogue between faith and culture in a way never imagined in the past. Byrne (2017) points out that the globalising presence of ICT has opened up new possibilities for a variety of different religions and world views to become visible and alive in the contemporary classroom. ICT when used in conjunction with Shared Praxis has the potential to enhance this approach to RE. It can bring 'life to faith and faith to life' through the use of social media, which allows students follow issues of faith and culture in real time. This is most effective when ICT is properly integrated and teachers have identified the reason for using it as well as the underlying pedagogy. Zukowski (2013) who specialises in e-learning for Catholic education argues that:

> Catechists who are truly digitally fluent blend creativity and innovation into lesson plans, assignments, and projects. They understand the role that digital tools and resources can play in creating meaningful faith formation learning experiences that engage the whole student.

Recent research carried out by Morrison-Reilly (2016) on the use of Smartphone microblogging in RE provides a useful example of what Zukowski suggests. Morrison-Reilly took an innovative approach to engaging students in discussions on images of God using their phones. The meaningful discussions that occurred showed that the chosen digital platform and assignment blended together to facilitate a formational learning experience (Morrison-Reilly 2016).

2.8.1 A Christian presence in the digital world

Unique insights and wisdom on the use of technology can be found by exploring religious perspectives on the topic.

> The digital age is taking us to new places on many levels and Catholic educators cannot be passive bystanders or mere implementers, but must be active designers and philosophical thinkers about what it means to be human in the digital age. (Zukowski 2010)

Horan (2010) acknowledges that communication and the development of relationships have changed for people because of technology. He wants to see the church become aware of the impact this is having:

> In an era marked by advances in technology, communication and virtual spaces, we must be attentive to how much our church community is being influenced or shaped by its new environment.

Horan poses the question:

> If Jesus had been born in 1980 and began his public ministry in 2010, would he have 'friended' the Twelve Apostles on Facebook instead of visiting the Sea of Galilee?" (2010)

Either way social media is a reality of the times we live in. Those who are aware of and open to its potential can use it to engage with and communicate issues of RE and faith in a new way. The Catholic Church is embracing the power of social media and new forms of communication. The Catholic Church has published several significant documents addressing communications. These include *Aetatis novae* (Dawning of a New Era 1992) and *The Church and the Internet* (2002). As has been customary since 1967, there has been an annual papal message to mark World Communication Day. In recent years, the Papal message for World Communication Day has provided valuable insight into appropriate ways of being present in the digital age. In his 2011 message: *Truth, Proclamation and Authenticity of Life in the Digital Age* Pope Benedict XVI invited people to confidently and creatively "join the network of relationships which the digital era has made possible" (Benedict XVI 2011). Taking a balanced approach to this invitation Pope Benedict XVI outlined practical concerns that must be kept in mind:

- Entering cyberspace can be a sign of an authentic search for personal encounters with others, provided that attention is paid to avoiding dangers such as enclosing oneself in a sort of parallel existence, or excessive exposure to the virtual world.

- In the search for sharing, for "friends", there is the challenge to be authentic and faithful, and not give in to the illusion of constructing an artificial public profile for oneself.
- It is important always to remember that virtual contact cannot and must not take the place of direct human contact with people at every level of our lives.

Pope Benedict clearly articulated that there exists a Christian way of being present in the digital world, which includes communication that is honest, open, responsible and respectful of others. Pope Francis continues to encourage a thoughtful and balanced approach for engagement in the digital world. The 2017 message focused on communicating hope and trust (Francis 2017). Bishop Paul Tighe who is responsible for the social media accounts for the Pope has indicated that he wants to see more than 'User-Generated Content' and would like to see a sense of 'User-Generated Culture' (Lee 2017). The efforts of the Vatican to integrate technology is an encouraging and empowering example for teachers of RE in Catholic school contexts. It is a useful to have this broader balanced perspective to draw from when integrating technology with RE.

2.8.2 Digital resources for RE

There have been a number of digital resources developed to support the teaching of RE in Ireland. A comprehensive resource that was developed to assist those teaching the *JCRES* was the *LOGOS* project. This was designed as a resource bank for teachers to download worksheets, lessons plans and background reading on the syllabus (Byrne 2005). An initiative that tried to develop a new approach for students to use ICT in RE was *Cyberclass*. This Junior Certificate textbook came with a CD Rom that resembled the book with hyperlinks to other chapters. This was not as successful as expected, mainly because of hardware difficulties in the piloting schools and because of timetabling constraints (Gunning 2002). *FaithConnect*, an interactive website, developed by a team from Veritas and the Mater Dei Institute of Education, was launched in 2009. It used technology in a multi-faceted way to reflect students' digital skills, especially the use of digital video and blogs. Research into the development and piloting of this website saw enthusiastic responses from teachers and students. The findings of the research confirmed that *FaithConnect* appealed to young people and helped them engage in RE in a new and innovative

way. However, issues regarding access to the computer room to make use of the website were a difficulty that saw the decline in numbers of users (Travers 2009). The content of the website was published as a textbook in 2011 (Walsh, Donlon, et al.), which could be used to accompany the website, but was mainly used as an alternative. It could be argued that *FaithConnect* was simply ahead of its time and that the rise in mobile learning may now provide a better context for *FaithConnect*. Exciting research and innovation in the use of ICT in RE is evident at Third Level (Fitzsimons 2012; Donlon 2010). The benefit of this expertise is being passed on to Newly Qualified Teachers (NQTs) and RE teachers are actively sharing ideas in a variety of online communities including blogs, Twitter chats and Facebook pages.

Since the arrival of iPads a variety of apps with daily quotes or meditations are available that can enhance the RE classroom (*Headspace, Smiling Mind, Insight Timer, Pope Francis Daily Surprise* etc). There have been a few specific apps with useful content for religious educators such as *DoCat* that looks at Catholic social teaching and complements the *YouCat*, a Catechism designed for young people. However, nothing has been created specifically for iPads in RE in the Irish context. Publishers have addressed the rise in mobile technology in education by making eBook versions of their textbooks available. They often have websites with web links and resources, mainly PowerPoints, available to accompany this. However, publishers have not created anything new with the 1:1 classroom in mind that integrates technology, pedagogy and content as a starting point or framework for resource development. This is the gap that this research will contribute to.

2.9 Chapter Summary

This chapter reviewed literature surrounding the three distinct areas pivotal to this research; technology, pedagogy and content. The TPACK and SAMR frameworks for technology integration were examined. Literature and research on the use of iPads in education were explored. Key features of twenty first century learning were identified and suitable pedagogical approaches for a 1:1 classroom were outlined. The subject specific sensibilities of RE were described. To facilitate the integration of content and pedagogy Shared Praxis was summarised as a suitable pedagogical approach for RE. Previous work on the integration of RE and technology were investigated. From the exploration of the literature it is evident that there is a vast variety of considerations

that need to be addressed when implementing the TPACK framework. This literature review has provided a clear roadmap for the integration of technology, content and pedagogy in Junior Cycle RE. Chapter three will present the research design.

CHAPTER THREE
RESEARCH DESIGN

> Alice: Would you tell me, please, which way I ought to go from here? The Cheshire Cat: That depends a good deal on where you want to get to.
>
> Lewis Carroll, Alice in Wonderland

3.1 Introduction

This research aims to create an innovative curriculum for religious education that integrates technology, pedagogy and content. This chapter addresses the research design and explains how the chosen methodology, action research, was the best choice for this research. A critique of action research will be presented. There are a variety of possible approaches to action research and the rationale for choosing the Educational Entrepreneurial Approach (EEA) (Crotty 2014) will be discussed. The key characteristics and four stages of this approach will then be detailed. The remainder of the chapter addresses the data collection methods and demonstrates how validity, rigour and ethical considerations were ensured. The chapter begins with an overview of the research paradigm and philosophical assumptions underpinning this research.

3.2 Research paradigm

Research is inevitably shaped by underlying assumptions about reality, knowledge and values. These ontological, epistemological and axiological assumptions influence how the researcher views the entire process of research and shapes the foundation for the construction of a body of research (Denzin and Lincoln 2011; Creswell 2007). This set of assumptions forms the paradigm or lens through which one sees the world and one's place in it. Educational research is embedded within numerous and diverse paradigms. By choosing one paradigm as opposed to another, one is already making a statement with regard to one's worldview and the philosophy that underpins it. A positivist paradigm stems from the tradition of scientific enquiry, which emphasises objectivity, numerical calculations, facts and figures, patterns and the construction of laws and rules of behaviour (Denzin & Lincoln 2011; Cohen, Manion and Morrison, 2011; Creswell 2007;). Knowledge is regarded as accurate and certain, when a theory is empirically tested and found to be

true. A positivist researcher is a distant outsider observing and investigating the phenomenon. An interpretivist paradigm is of a subjective nature with events and individuals being seen as unique and non-generalisable (Cohen, Manion and Morrison 2011). An emphasis is placed on the individual and aims to understand their interpretations of the world around them (Cohen, Manion and Morrison 2011). An interpretivist researcher conducts research on others. A pragmatic paradigm is essentially a practice-driven model. A pragmatic researcher begins with research questions and then will use the best method they feel appropriate to solve their research problem (Punch 2009).

A social constructivist paradigm underpins this research. Researchers with a social constructivist lens view meaning as something that does not exist in its own right; human beings construct it as they interact and engage in interpretation. Realities are local, specific and constructed depending on the individuals or groups holding them. A social constructivist researcher gathers data from the researcher's interaction with contexts and persons within. In line with the social constructivist paradigm, this research employs methods such as observation and interviews to acquire multiple perspectives. According to Robson (2011) the social constructivist approach is very open in the sense that it does not proscribe or prescribe any specific or particular way of doing research or method of data collection. The ontological, epistemological and axiological assumptions that shaped the chosen research methodology for this study will now be outlined.

3.2.1 Ontology

Ontological assumptions are the nature of reality for the researcher. The lens through which I view the world, my ontological perspective, is influenced by everything I have experienced. My undergraduate degree from the Mater Dei Institute of Education allowed me to develop a heightened sense of self-awareness because the subjects, including philosophy, world religions, moral theology and ethical debates, encouraged me to think about my own life and beliefs. The search for meaning and values is a topic that I enjoyed studying and now one that I love to teach. The opportunity to reflect on who I am and examine my beliefs and values is one that has

stood to me and has allowed me to notice the life experiences that have influenced the evolution of my perspective. Closely connected to these experiences are the values at the heart of this research. In the course of the research I have developed further insights into my understanding of my ontological values. My chosen methodology, the 'how' of this research, is action research. This methodology offers a vehicle towards ontological harmony as it seeks to realise values in practice (Elliot 1991).

3.2.2 Epistemology

Ontology and epistemology are inextricably linked. Epistemology is concerned with how we understand knowledge, including how knowledge is acquired. The question of whether I see knowledge as an objective reality or as a subjective experience of reality will affect how I go about uncovering knowledge. I agree with McNiff and Whitehead who state that knowledge is 'never static or complete: it is in a constant process of development as new understandings emerge' (2002, p.18). A social constructivist learning theory, that understands knowledge as socially connected and constructed, as outlined in chapter two, underpins my pedagogical approach. A constructivist paradigm assumes a relativist ontology, that each person experiences their own version of reality. This aligns to a subjectivist epistemology where knowledge is seen as something co-created between the researcher and the researched. Furthermore, knowledge is seen as the outcome of human activity, which in turn suggests knowledge is constantly changing and evolving based upon experience and dialogue (Denzin & Lincoln, 2011). For me, knowledge is a product of constructed learning through interactions with others. My view of knowledge as ongoing rather than static has implications for my choice of methodology. Action research, with its cyclical and continuous nature, aligns itself to my epistemological stance.

3.2.3 Axiology

The axiological assumptions, that is the role of values in the study, are an important foundation for action research. McNiff and Whitehead (2006) assert that researchers need to spend time reflecting on their core values to discern if they truly espouse them. Action researchers should openly espouse their values to enable their research to emerge as 'living in the direction' of their values. Reflective practice is essential

for researchers as they strive to articulate and live out their values. Schön's (1983) model of reflective practice involves refection on and in action. My educational values as outlined in chapter one drove my research question and guided my choice of methodology. An Educational Entrepreneurial Approach to Action Research (Crotty 2014) requires the researcher to use their values as guiding principles to ensure that the research remains true to what they are passionate about.

Research Paradigm
Social Constructivism
Methodology
Action Research
Approach
Educational Entrepreneurial Approach

Table 3.1 Research Design

3.3 An action research methodology

The methodology and design of research is determined by the aim and purpose of the research (Cohen, Manion and Morrison, 2011). In keeping with the philosophical underpinnings, rationale and the overarching paradigm of this research, an action research methodology was employed. Action research can be defined as "a process of learning from experience, a dialectical interplay between practice, reflection and learning" (McNiff & Whitehead, 2002, p. 15). According to Newby (2010) the defining characteristic of action researchers is that they seek to develop and implement change as a result of utilising action research as a methodology. In this research, I asked how I could better integrate iPads in RE. The improvement of my practice, a deeper understanding of my practice, and making a positive change to the context of my practice were all motivating factors that drew me to action research.

Lewin (1946) generally credited with coining the term 'action research' developed an approach that consists of six stages: 1) analysis; 2) fact finding; 3)

conceptualisation; 4) planning; 5) implementation of action; 6) evaluation (See figure 3.1)

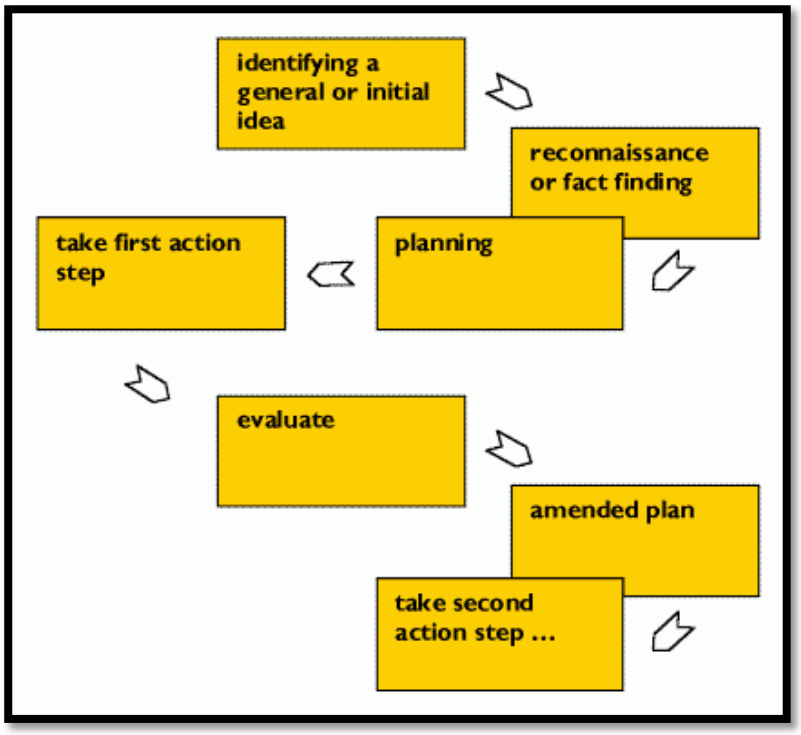


Figure 3.1: Lewin's 1946 Model of Action Research Cycles. Source: Smith, K. http://www.infed.org/thinkers/et-lewin.htm (accessed 26th June 2017)

For Lewin the aim was to bring about social change stating "research that produces nothing but books will not suffice" (1948, p 203).

While Lewin's model forms the basis of current action research, many varied approaches have developed from it. Action research models typically ask the practitioner to plan, act, observe and then reflect. Design for action research, which is focused on bringing about improvement in practice through a cyclical process, is necessarily flexible as reflection on one cycle of action leads to a revised plan for the subsequent cycle.

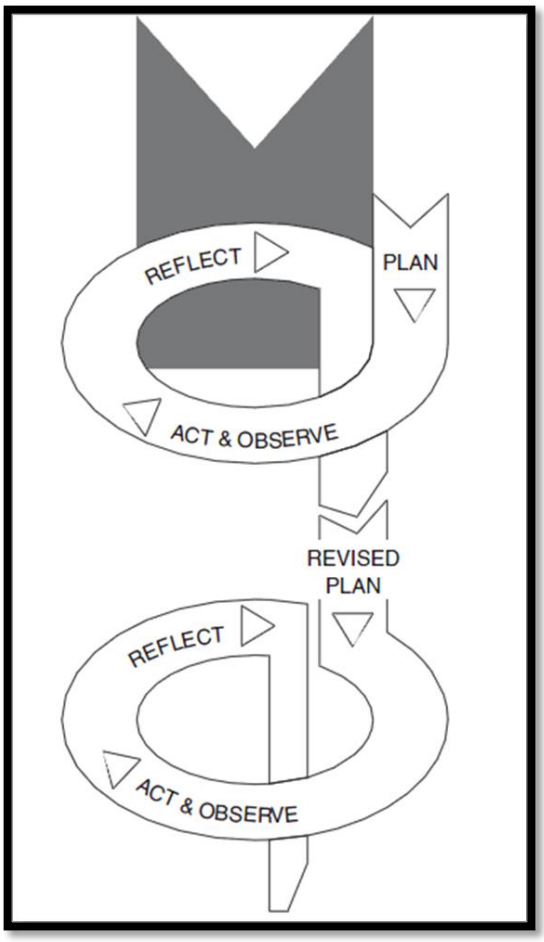


Figure 3.2: The Action Research Spiral (Kemmis & McTaggart, 2000)

One of the key features of action research is that it is collaborative, that is where the research is carried out with the help of others. Carr and Kemmis (1986) advocated "emancipatory action research" as a participatory form of research and according to them "the aim of involvement stands shoulder to shoulder with the aim of improvement". McTaggart & Kemmis (1988) further expanded on the collaborative nature of action research and called it Participatory Action Research (PAR). Carr and Kemmis (1986, p. 162) outline three areas of improvement made possible by action research:

> "Action Research is simply a form of self reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices and the situations in which the practices are carried out"

Whitehead and McNiff (2006) recognise the centrality of the 'I' of the researcher in relation to practice, to other participants, and to the context of the research. They

consider research to be a holistic practice, where the practice informs the theory and the theory informs the practice as a self-generating spiral which can inspire and promote new educational theory and practice. Whitehead (2008) differentiates between the terms ‘education theory’ and ‘educational theory’ and explains that education theory is drawn from the disciplines of history, philosophy, psychology and sociology, whereas ‘educational theory’ is drawn from educational practice

Corey (1953) first spoke of action research as being a means for improving practice in school. He urged teachers to research their own practice in order to improve it. Stenhouse (1975) was a strong advocate for teacher research, with an emphasis on teachers researching their own practice rather than implementing outsider researcher's ideas. He argued that “it is not enough that teachers' work should be studied, they need to study it themselves” (Stenhouse 1975, p. 144). Due to its cyclical and adaptive nature action research is regarded as a suitable method for educational research with a backdrop of constraints and pressures in a busy school environment. Cohen, Manion and Morrison (2011) identified numerous areas of school life where action research could be used including teaching methods, attitudes and values and in-service development of teachers. They also identified action research as a suitable method for curriculum research and development as is the case in this research. Elliott, a founder of the Classroom Action Research Network (CARN), now known as the Collaborative Action Research Network, suggested that the while action research can contribute to knowledge the fundamental aim of action research for teachers is to improve practice (Elliot 2004, 1991). For Elliott, educational action research seeks to have teacher-researchers, rather than the academic disciplines, declared to be the main contributors to educational research.

Action research in education may be conducted in numerous ways; by a teacher or teachers working alongside a researcher or researchers, a group of teachers collaborating together or it may be pursued by a single teacher operating within his/her own class. Cohen, Manion and Morrison describe the motivation and approach of a single teacher researcher:

> “She will feel the need for some kind of change or improvement in teaching, learning, or organisation, for example, and will be in a position to translate

> her ideas into action in her own classroom. She is at were, both practitioner and researcher in one and will integrate the practical and theoretical orientations within herself" (1994, p.189).

However, even with the single teacher approach, collaboration is a common characteristic because "the problems of teachers are often shared with other teachers in the same school" (Cohen, Manion and Morrison 1994, p.189). This description effectively captures the approach that I took as a single teacher practitioner-researcher with the involvement and co-operation of my colleagues in the RE department.

Whitehead (2008) refers to action research as creating your own 'living theory' so some approaches to action research focus on creating theory. Stringer's (2004) view is that the action researcher is not trying to invent a new theory but instead seeks to find a solution to a practical problem in order to improve their practice. For example, in this research, I felt motivated to create something practical that could help establish a new approach to RE in light of our new access to technology and our transition to non-examination RE. My desire to create something practical for my workplace lead me to choose the EEA (Crotty 2014) because this approach to action research involves the design and development of an educational multimedia artefact or curriculum that has a practical application. I will detail this approach in the next section.

3.4 An Educational Entrepreneurial Approach to action research

The EEA as the name suggests, focuses on both educational and entrepreneurial elements. It is educational, in so far as the researcher creates an educational artefact or curriculum to improve their workplace practice. It is entrepreneurial because the researcher, in order to create something of value, must plan and design an original concept and bring their idea to fruition. Action researchers look at their practice and ask themselves "How can I do this better"? (McNiff & Whitehead, 2002). While other approaches focus on the researcher updating or improving the curricula, Crotty (2016, 2012) specifically allows for the creation of an original innovative multimedia resource. While the creation of a curriculum or multimedia learning artefact is the central part of the research process the researcher needs to begin by saying what research question/s the development work is addressing. The research

question needs to be clear and evidence is needed to prove the research is doing what it has said it is doing. The researcher must explain how the creation process is informed by the literature and reflective practice. The data that is collected is analysed and in turn informs the curriculum or multimedia artefact and this is the iterative cycle of research. The EEA is a collaborative process. This approach concludes with the researcher showing the evidence of impact on themselves, at a personal and professional level as well as on their workplace and perhaps in a wider context.

My research question asked: How can I create an innovative curriculum for religious education that integrates technology, pedagogy and content? It was clear that the action at the heart of this research would culminate with the creation of a new curriculum, making the EEA the most suitable choice. I was also drawn to the EEA as it specifically emphasises curriculum design for the use of technology (Crotty, 2016). The decision that the EEA was the most appropriate to suit the nature of my research was further clarified as I examined the defining characteristics of this approach to action research. There are three unique characteristics that define the EEA:

- It involves the creation of a multimedia artefact or curriculum aimed at improving the researcher's own work context and workplace practice.
- It is a value-based approach, driven by the values of passion, creativity and excellence as well as the researchers' own articulated values.
- It is collaborative research with an emphasis on co-creating knowledge.

The idea of creating a multimedia curriculum based on my espoused educational values to see an improvement in my own practice appealed to me. The collaborative nature of the EEA (Crotty 2014) also meant that I could include the involvement of my colleagues in the RE department as well as my students allowing us to co-create a curriculum relevant to our own unique context.

The action reflection cycles of plan, act, observe and reflect are still integral to this research approach, however the EEA follows four key research stages; Explore, Understand, Create and Transform. Cycles of reflection and analysis are ongoing

throughout each step. Figure 3.3 shows a graphical representation of the four stages of the EEA, which I will now outline in detail.

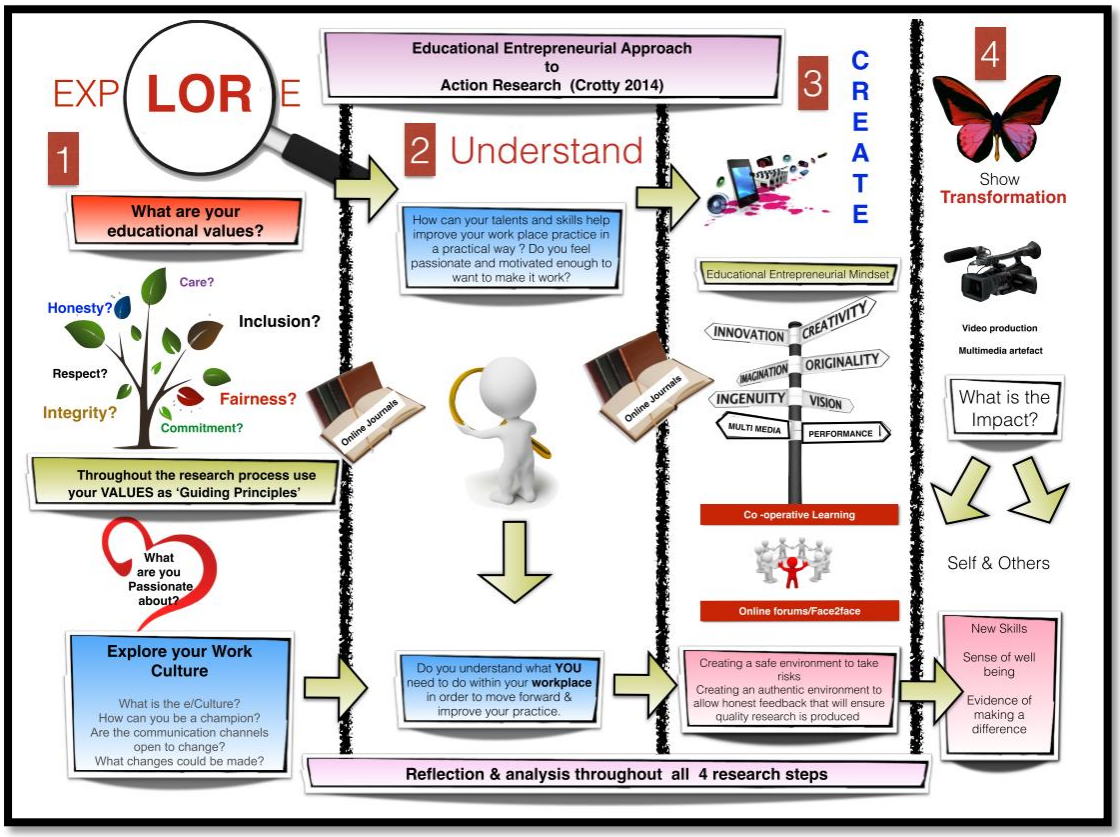


Figure 3.3: The Educational Entrepreneurial Approach to Action Research (Crotty 2014)

3.4.1 Explore

In this initial stage it is important to consider the ontological perspective of the researcher themselves, the openness of the researcher's workplace to change and the existing scholarship that is available (Crotty 2016). At the outset of the EEA the researcher needs to explore their passions and values (Crotty 2016, 2014). As McNiff (2002) suggests action research is a way of working that helps to identify important values and to live in the direction of those values, that is, take them as the organising principles for life. By reflecting on and articulating their values the researcher is motivated to carry out meaningful relevant research. These values become the guiding principles throughout the EEA to help keep the researcher in line with what they truly believe in (Crotty 2014).

This first stage of the EEA also calls for the researcher to examine their workplace. The EEA draws upon Rosenberg's (2001) 4 C's of e-learning strategy success to achieve this – Culture, Champions, Communication and Change. It is in this exploratory phase that the researcher can begin to consider if and where change is needed to improve work practices. Espoused values can sometimes conflict with the work context. It is therefore important to explore the work culture of which they are a part, identifying organisational values and establishing if the organisation is actually open to change. The researcher needs to identify 'champions' who can assist in facilitating this change and establish whether the channels of communication are open to enabling and sustaining the change (Crotty 2014). Indeed another very important factor in this phase that could be regarded as a fifth 'C' of success is the collaborative nature of the EEA. Collaboration is encouraged within the workplace as well as the university and wider social context to help further strengthen the research.

Finally this initial stage is where the exploration of the relevant literature begins, helping to shape the research and identifying the direction to take to make changes in the workplace. In this stage the use of journaling to record thoughts, ideas, experiences and insights begins and this continues throughout all four stages (Crotty 2016). This facilitates the ongoing process of analysis and reflection needed for the EEA as well as providing an important source of data and evidence.

3.4.2 Understand

In the second stage of the EEA the researcher begins to synthesise the various components of their espoused values, their work context and the relevant literature in order to understand what they have to do to bring about a positive change. In this second stage it is important for the researcher to consider how their talent and skills might help improve their workplace in a practical way. These might include digital, multimedia or other creative skills that can enhance workplace practice (Crotty 2016).

The second stage of the EEA places a strong emphasis on whether the researcher is motivated enough to follow through on the commitment required to design a quality artefact or curriculum (Crotty 2014). The importance of exploring your values as a

researcher in the previous stage becomes clearer and more relevant as the study progresses as the researcher is more likely to have enough motivation to sustain them throughout the research process if what they are doing is underpinned by their values.

Having explored the literature in the first stage of the EEA the researcher must now move to understand how the research can contribute to new knowledge as well as expanding upon the existing literature. The collaborative nature of the EEA once again comes to the fore as it is also essential that the researcher understands the perspectives and potential concerns of all collaborators and stakeholders in the research (Crotty 2016).

3.4.3 Create

The third stage of the EEA is the time to 'unleash the creative and innovative potential within the practitioner' (Crotty, 2014, p. 76). At this stage it is essential for the researcher to establish a clear overall vision for what they want to create. This vision will be influenced by the work undertaken during the 'explore' and 'understand' stages of the research. However, during the create stage this vision should be further refined through continued reflection and discussion with others. It is important that the researcher is open to the co-creation of knowledge. The reoccurring emphasis on collaboration is essential to the EEA, allowing an individual practitioner researcher to create something practical and relevant for their intended audience through the active participation of others in the research.

During this third stage of the EEA the researcher must also decide what type of multimedia is most suitable to get their message across (Crotty 2016). The EEA places creativity as a core value and the researcher needs to use their imagination to make decisions regarding the design and delivery of their work. Technology is also at the centre of the EEA. This means the researcher should adopt a multimodal approach, combining a variety of elements such as text, audio, images and video (Crotty 2016, 2014). Adhering to the EEA the researcher must demonstrate ingenuity and originality in their work throughout the create phase in order to create an innovative artefact.

It is imperative that the researcher is prepared to move their work forward throughout the create phase by taking risks. Risk is a key principle in ensuring rigour in action research (Winter, 1989). The researcher needs be confident that they are taking risks in a safe and open environment. It is important that the researcher creates such an environment to ensure they receive honest feedback. An important aspect of this is the 'performance' element of the EEA. Within this approach, performance involves presenting your work in an authentic environment at different stages throughout the research in order to obtain constructive feedback. Social validation meetings provide a suitable environment for the researcher to share their work and also ensure the rigour and validity of research. One of main values underpinning the EEA is excellence. Both risk and performance are integral elements that ensure the researcher continually strives for excellence by improving and strengthening their work to produce a quality artefact and quality research (Crotty 2014).

3.4.4 Transform

The final stage of the EEA requires the researcher to analyse and reflect on the impact of their work in order to show transformation (Crotty 2014). The researcher should by now have created a multimedia artefact or innovative curriculum inspired by their values, shaped by the literature and influenced by their work context. The finished artefact may have gone through a number of iterations based on the action research cycles carried out. The researcher at this stage is now invited to step back from what they have created to look at the impact of the research process. This stage is an opportunity to reflect on the aims that were set out at the beginning to see if they were achieved and to point to evidence of how the researcher was guided by their values and passions throughout.

The impact of the research is firstly examined from a personal perspective. A process of continuous reflection, on a subject matter that the researcher felt drawn to based on their values and passions, creates an opportunity for significant personal growth and development. The onus is on the researcher to articulate how the research has impacted on them at both a personal level, such as their own sense of wellbeing and at a professional level, highlighting any new skills developed as a result of engaging with the EEA (Crotty 2016). Most significantly, the researcher

needs to establish if their artefact or curriculum has improved their own workplace practice (Crotty 2016).

At the outset of the EEA the researcher spent time exploring their work environment and envisioning possible changes that could occur as a result of the research. It is important now to determine if the research has made an impact upon the work culture in which it took place. As with any authentic action research journey the changes cannot be predicted and may not be what the researcher expected. Due to the adaptive and flexible nature of action research decisions made may have brought the research in an unexpected direction. What the EEA focuses on now is identifying what difference this research has made by examining if there has been a change in work practice or culture as a result of this research intervention. The researcher may be able to provide evidence of the impact of the artefact or curriculum on the target audience if the resource has been used within the researcher's work context. Further reflection may also allow the researcher to examine if the research has had any impact on the wider society.

McNiff & Whitehead (2002) suggest that there is no final outcome in action research because it's a cyclical approach to life and learning where we are continuously experiencing, learning and changing who we are in the hope that our new understanding and knowledge will make a positive impact on us and others. The final stage of the EEA may also be an opportunity to begin to speculate about future potential for further action.

3.5 Criticism of action research

Common criticisms of action research include the use of restrictive and unrepresentative samples, situational and specific to the context with results that are not generalisable. Action research is often based on small scale investigations and "may be insufficient to lead to new insights or that they may be too small-scale to be valid or that they may be too convoluted to be practical" (Zuber-Skerrit 1996, p17). It has been pointed out that giving action researchers a small degree of power to research their own situations has little effect on the real locus of power and decision making because this is often beyond the control of action researchers (Cohen, Manion and Morrison 2011). However, Cohen, Manion and Morrison clarified that

the focus of action research is a specific problem in a specific setting so the emphasis is on precise knowledge for that specific context rather than obtaining generalisable knowledge (2011). Bradbury (2015) argues that conventional methods of inquiry have not kept pace with our changing world while action research responds to the big issues of our time such as the information technology revolution. She concludes that action research helps respond to the conventional disconnect between theory and practice (Bradbury 2015). She further rebukes criticism of action research stating that it actually goes "beyond applied research into the democratization of research processes, programme design, implementation, strategies, and evaluation" (p.3). According to Bradbury (2015) as we understand how global challenges are anchored in local problems "it is better to have more citizens capable of developing practical knowledge" (p.4), suggesting that an action-orientated approach to knowledge creation is essential. Bearing these critiques in mind, the focus for this research is to address the specific needs of my work context. Following the EEA this research will be shared at both a practical and theoretical level with other practitioners and while the findings may not be generalisable the knowledge created will be transferable to numerous other contexts.

3.6 Data collection methods

Action research can employ both qualitative and quantitative research techniques. The focus for this research was on qualitative data collection methods in order to "obtain the intricate details about phenomena such as feelings, thought processes, and emotions that are difficult to extract or learn about through more conventional methods" (Strauss and Corbin, 1998, p.11). The data needed for this research was collected in an on-going and cyclical way throughout the research. Data collected at the start showed what was happening before the action was planned, and how they were being used. Further data was generated as the action was being implemented. This involved monitoring my own actions, other peoples' actions, and critical conversations about the research (McNiff, Lomax and Whitehead 2003). This data is analysed and interpreted in chapters four and five as evidence of the process undertaken as well as the transformation that has occurred as a result of this research. Mills (2003) identified three categories of data that can be used in action research. He described these as the three E's: experiencing, enquiring and examining.

Experiencing is data gathered through the researcher's own experience. A research journal was employed to record my experiences. Enquiring data is collected by asking participants to respond in some manner. In this research, data was gathered from meetings with my colleagues in the RE Department and online questionnaires were employed to gather responses from student participants. Data was also collected through examining student work routinely collected throughout the research and through examining the finished iBook artefact.

3.6.1 Research journal

Research journals are a common method for gathering data in action research. Keeping a journal is central to the EEA (Crotty 2016, 2014). This allows for the recording of the researchers experience as suggested by Mills (2003). It supports the consolidation and validation of research (Kirk and Miller 1986). Journaling also facilitates the researcher to be a reflective practitioner and engage in reflection-in-action and reflection-on-action (Schön 1983). This level of reflection is pivotal throughout all four stages of the EEA (Crotty 2014). Hendricks (2009) outlines a number of useful reflective journaling techniques that can support the reflection process:

- Write notes as soon as possible
- Set aside time to review and expand the detail
- Use prompts to start writing
- Include information about the context
- Document actions you might consider taking
- Review the journal regularly to help see themes and patterns
- Use technology in collaborative reflection activities

Journaling was the main method used to record and reflect my experiences and reflections throughout this research journey. From the outset that reflection was important to increase my awareness at each step of the process. During the implementation phase journaling allowed me to document my observations. It included making notes from my observations about my own practice and class activities, as well as recording comments from my students and informal conservations with my colleagues throughout the process. The data collected in the

journal was both written and visual, including photographs and videos. Extracts from the research journal are included throughout chapters four and five as evidence of the actions taken and the reflections on the process that guided the research.

3.6.2 Questionnaires

A questionnaire was selected as the main instrument to gather data from students. A pre-research questionnaire recorded students' use of their iPads and identified what apps they had on their devices (See Appendix F). This data assisted in the planning of this research. A post-research questionnaire recorded students' feedback on their engagement with the *Wonderlands* curriculum (See Appendix G). Questionnaires allow participants to remain anonymous, thereby allowing for a process that is more open and producing more reliable data (Cohen, Manion and Morrison, 1994). The questionnaire was designed to incorporate a variety of question types. It consisted of open-ended questions to allow respondents to provide richer, contextual, qualitative data. This was used to gather feedback about using the *Wonderlands* curriculum. Some nominal quantitative data was also gathered with closed questions.

The questionnaires were piloted with one class to ensure its suitability as a research instrument. No major revisions were made following feedback from the pilot, but one question was modified to allow participants select more than one option. Following the incorporation of this change the questionnaire was deployed electronically to the students using Google Forms, an online survey tool. Feedback received is shared throughout chapters four and five.

3.6.3 Recording minutes of RE department meetings

Through regular meetings with colleagues I was able to gather useful data. Our regular RE Department meetings facilitated the sharing and comparison of our experience of using iPads in RE. On a number of occasions my colleagues provided feedback on the various iterations of the *Wonderlands* curriculum. While an informal approach was adopted I was aware that I had to guard against certain factors to avoid contaminating the data (Cohen, Manion and Morrison, 1994). In particular I had to be aware of:

- Bias - where the researcher allows their own opinions to obscure the data.

- Leading questions - where the researcher seeks to elicit a certain response by using carefully crafted questions.

A question sheet was prepared for two of the RE department meetings, one after the 'Understand' stage of the research and one at the end of the 'Create' stage but these was not an exhaustive script of topics, rather a guide with key ideas identified for further probing (see Appendix H). Feedback received is shared throughout chapters four and five.

3.6.4 Student artefacts

Samples of student work were collected and saved throughout the different research cycles. For example, photographs of students collaborating or student created iBooks were saved to show how the values of creativity and collaboration were influencing the research. Examining student work allowed me to analyse the progress of the research and provided evidence of the transformation in my workplace practice and the impact of the research on my workplace. This evidence is included in chapters four and five.

3.6.5 My curriculum and artefact

My completed *Wonderlands* curriculum and the iBook artefact I have produced to present it in are the most valuable sources of data and evidence for this research. It is my evidence to show how I can now integrate our new iPad technology appropriately with content and pedagogy. It is evidence of how the research and literature shaped the curriculum and improved my pedagogical practice. Access to the iBook is shared at the beginning of chapter five. Screenshots and extracts from it are included throughout chapter five as supporting evidence of the transformation that has occurred.

3.7 Data analysis

In action research data analysis occurs throughout the research. The methodology of action research requires the researcher to constantly evaluate what they are doing to see if it is working. McNiff (2002) says this is essential to establish if you are actually influencing your situation or just fooling yourself. This can be one of the most daunting aspects of being an 'insider researcher' (McNiff and Whitehead 2006). The process of generating evidence to support conclusions involves sorting

the data, analysing it for meaning and identifying criteria and standards of judgement for the action (Whitehead and McNiff 2006). Interpretation of the data collected at the start of the research contributes to planning for action. The analysis of data collected while monitoring the action is used to develop a tentative explanation of what has happened and contributes to evaluation of the action, which can feed into planning for subsequent cycles.

3.8 Participants

Students from class groups timetabled for RE who were 'willing and available to be studied' (Creswell 2012, p.145) were invited to take part in this research. The first cycle of action research, in the academic year 2014-2015, was carried out with one first year class group, consisting of twenty-four students. These participants were involved throughout the three years of their junior cycle programme, which coincided with the three cycles of research conducted. The research was conducted over a short timeframe each year as it related to one particular topic within the RE course. The remaining two cycles of research were carried out in the academic years 2015-2016 and 2016-2017. An additional two Junior Cycle class groups participated for these two years, to include class groups timetabled with my colleagues in the RE department. In the second cycle during the academic year 2015-2016 a group of twenty-four Transition Year students also piloted part of the *Wonderlands* curriculum. In total the sampling consisted of ninety-six students who voluntarily agreed to participate in this research with parental consent. My colleagues in the RE Department also consented to be part of this research.

3.9 Validity and rigour

It is of paramount importance that research is both valid and rigorous. Following the four stages of the EEA (Crotty 2014), as outlined above, helps to ensure the validity and rigour of this research. Over the period of the research data was collected, recorded, shared, discussed, evaluated and acted upon all while working closely with my supervisors. Regular social validation meetings are important in the EEA to strengthen the validity of the research by providing a safe environment for taking risks and sharing the research at different stages to allow for honest feedback and critique from peers. The performance element of the EEA also encourages sharing of the research and further feedback outside of the social validation meetings. To

further compound the validity of the research I chose to focus on Habermas's (1976) four criteria of social validity when sharing the research. These four criteria are:

- *Comprehensibility* – was it clear to my peers what I was trying to do?
- *Truth* – is my research an honest account of my findings*?*
- *Authenticity* – did I remain true to myself and my values?
- *Appropriateness* – Is the curriculum relevant and suitable for my work context?

Following these criteria facilitated the open and honest scrutiny of my peers, ensuring the validity of the research.

Embedded throughout the four stages of the EEA are Winter's (1989) Criteria of Rigour. Winter (1996, p.13) cites these principles as:

- *reflexive critique*,
- *dialectic critique*,
- *collaboration*,
- *risking disturbance*,
- *creating plural structures*
- *theory and practice internalised*.

For Winter reflexive critique means deconstructing your thinking in light of new learning from experience (1989, 1996). It relates to judgements made from one's own personal experiences. During the reflexive critique process, it is not enough to reflect on my practice in isolation from my values and assumptions. For example, in this research I questioned my practice and reflected on how I can improve it in relation to my values of creativity and collaboration. I documented this process in my research journal. Thus, I am able to make explicit why I do what I do and show how I deconstructed my own thinking in light of new learned experience in my school context. Winter suggests that we need to include both a reflexive and dialectic critique in our work. Dialectics is about challenging contradictions. A dialectic critique identifies and confronts the contradictions between values and lived

experience. Particularly relevant to this research has been my engagement with dialectic critique, as I identified and attempted to resolve the contradictions that existed between my own values of creativity, collaboration and courage with my practice. Once I determined what these contradictions were, I was able to identify how I hoped to rectify them through this action research process.

Risking disturbance according to Winter is appreciating that nothing is certain but you embark on the journey nevertheless (1989, 1996). The element of risk is synonymous with the creation phase of the EEA (Crotty 2016, 2014). Being creative involves taking chances, exploring something new, risking that something may (or may not) work. By definition, this means there is always the possibility of looking a bit foolish in front of others. To overcome this inherent risk, the EEA encourages the use of performance in safe environments. This element of performance also enhances collaboration. Collaboration is important to ensure rigour in action research and is one of the core values that underpin the EEA (Crotty 2016, 2014). For Winter (1989), this means inviting other people to contribute to our action research to help us to see other points of view. By collaboratively interpreting data, we may be more aware of how our own personal biases and assumptions influence the analysis. This aligns with the emphasis on performance to inform and shape the research in the EEA (Crotty 2014) and it is similar to collaborative nature in the thinking of McTaggart & Kemmis (1988) for Participatory Action Research (PAR).

Creating plural structures or plurality is at the heart of the EEA method of action research. It calls for the creation and use of multimodal resources (Crotty 2016, 2014). A plural form of research requires a plural form for reporting. This research includes a multiplicity of different forms of multimedia representation including journal extracts, screenshots of online learning, videos, photographs and the interactive iBook artefact itself to show proof of the plurality used within the research. According to Winter, theory and practice ‘do not confront one another but are necessary to each other for continued vitality and development as questions are asked and contradictions confronted in unending transformations’ (Winter, 1989, p.67). This means that theory and practice are not seen as two separate entities but are intertwined. Theory informs practice and practice, in turn, informs theory. Following the four stages of the EEA (Crotty 2014), the researcher links the

questions raised in the literature with his or her own practice, makes explicit the theories that inform a change in practice and shares evidence to demonstrate the transformations that have occurred. Thus, following the four stages of the EEA with Winter's (1989) six criteria of rigour embedded ensures that when findings are presented for verification they will be deemed reliable.

3.10 Ethics

Following approval from the Research Ethics Committee of Dublin City University, the purpose of the research was explained to all stakeholders – the School Principal, the Board of Management, the RE Department, the students and their parents/guardians. Consent was sought and obtained from the Principal and the Board of Management to carry out this action research within the school community (Appendix I). Consent was sought and obtained from my colleagues in the RE Department to be named as co-creators and collaborators in this research (Appendix J). Consent and assent letters with plain language statements detailing the right to confidentiality, the right to anonymity, the right of withdrawal at any stage and the educational benefits and risks of the research were given to all student participants (Appendix K). Consent was obtained from the parents/guardians of student participants under the age of eighteen (Appendix L). Creswell (2009) advises that ethical considerations in research are much more than following a set of guidelines provided by professional associations and asserts that anticipating ethical issues in all stages of research is crucial.

As ethical gatekeeper for this research I had the utmost respect for my students and colleagues who opted-in to participate in the research, aware of and sensitive to the delicate balancing act required in respect of my relationship as colleague, teacher and insider researcher. Once again I drew on Habermas (1976) to speak comprehensibly, truthfully, authentically and appropriately at all stages of this research while being mindful of the experiences and needs of all the participants within the research. Mercer (2007) points out the complexities of ethical concerns, especially around issues of power and authority for insider research viewing it as a 'double-edged sword'. Wickens and Crossley (2016) suggest that reflexivity is essential to overcome the difficulties of adopting two different roles within an organisation arguing that the insider researcher must consciously reveal their beliefs

and values as they co-construct their research findings. However, Drake (2009) contributes that reflexivity can be enhanced with distance suggesting periods away from the research and a refreshed return to avoid being too close. Le Gallis (2008) suggests that fluidity along the insider-outsider continuum should be embraced as it provides an opportunity for 'richness of insight' (2008, p.153). Wickens and Crossley (2016) coined the term 'alongsider' to reference the fluid position of the insider-outsider continuum, particularly for a team approach of co-creation. They agree with Roland and Wicks who asserted that many minds being applied collaboratively to date through a fluid process maximises 'academic integrity' and minimises 'potential concerns about bias' (2009, p 10.)

3.11 Chapter summary

This chapter described the philosophical principles underpinning the research design including ontological, epistemological and axiological assumptions. These assumptions, as well as the research subject itself, guided the choice of action research as an appropriate methodology. The rationale for choosing the EEA (Crotty 2014) was articulated and the four stages of this approach, Explore, Understand, Create and Transform were explained. This chapter also set out the details of the data collection, sampling and data analysis methods utilised in this research. Finally, this chapter demonstrated how rigour, validity and ethical practice were adhered to throughout the research. Koshy suggests that "through action research, a researcher can bring a story to life" (2010, p. 25). In the next chapter I will present the story of my research journey to show how the implementation of the EEA brought about the development of the *Wonderlands* curriculum and began to transform my practice.

CHAPTER FOUR
THE WAY TO WONDERLAND

> What is the use of a book, thought Alice, without pictures or conversations?
>
> Lewis Carroll, Alice in Wonderland

4.1 Introduction

The Educational Entrepreneurial Approach (EEA) to action research (Crotty 2014), as outlined in the previous chapter, culminates in the creation of multimedia artefact or innovative curriculum. As a result of adopting this approach I developed an original curriculum called *Wonderlands* for Religious Education (RE) and presented it in an interactive iBook artefact designed specifically for a 1:1 iPad environment. The purpose of this chapter is to guide the reader through my research journey and the actions and reflections undertaken. In this chapter I will use the first three stages of the EEA Explore, Understand and Create (Crotty 2014), to outline my research journey. Each main heading represents a new school year and a new cycle of action research. Table 4.1 provides an overview of the main cycles of action research carried out.

	Explore 2014/15 *Year 1 of 1:1 iPad adoption & non-examination RE*	**Understand 2015/16** *Year 2 of 1:1 iPad adoption & non-examination RE*	**Create 2016/17** *Year 3 of 1:1 iPad adoption & non-examination RE*
Focus	Exploring my changing work context and the educational affordances of iPads	Understanding how I can improve my practice through the development of a new integrated approach	Creating and piloting the interactive iBook artefact
Outcome	Identified the potential benefits of iPads for collaboration and creativity. A new department approach began.	A more refined approach with a clear focus on one main app to foster creativity and collaboration. Pilot of curriculum assessment highlighted need for background lessons.	*Wonderlands*, a curriculum that integrated technology, pedagogy and content was created.

Table 4.1: Action Research cycles

During these reflective cycles of the EEA my exploration of my values deepened and my understanding of what I could do to improve my practice grew. Each year I created new opportunities for teaching and learning with iPads and the transformation in my work practice became evident. Throughout this chapter I will demonstrate how I lived out my educational values and followed the guiding principles of the EEA by collaborating and co-creating the curriculum with my colleagues. I will also outline how the risk, performance and feedback elements of this approach were paramount in validating my work. In the next chapter I will focus on the final stage of the EEA 'Show Transformation' (Crotty 2014) to reflect on the overall transformation that has occurred as a result of this research.

4.2 Explore

Figure 4.1: An overview of the research during the Explore stage

4.2.1 A changing context

The impetus for this research was a twofold change in my workplace context: the introduction of student iPads and the move to non-examination RE. I commenced my research with an investigation into my changing work culture and context. This coincided with an in-depth exploration of my values and passions as well as enquiry into the relevant literature that helped me identify how I could best respond to the changes in my workplace.

4.2.1.1 A new organisational eCulture

Chapter one introduced my workplace context and outlined the organisational values that underpin it, shaping a culture of freedom, justice, sincerity, truth and joy. Following the EEA I had to further examine the specific 'eCulture' (Crotty 2014) in which this research was embedded. The eCulture was in a state of flux as we transitioned to 1:1 iPads. While I was excited for their introduction, the rapid pace of change overwhelmed me and my concerns were evident in my journal:

> I was surprised at how much had changed in terms of technology while I was on secondment. My folder of acetates is no longer relevant as all the old projectors are gone. We had portable laptops and projectors before I left but upon my return every classroom is equipped with these and we have a portable iPad trolley. We had a strict no mobile phone policy but now we begin the transition to students having their own iPads, with access to the internet and a camera in their hands at all times. Part of me is excited for what lies ahead but I feel unprepared for this change. *(Journal entry extract, 11/09/14).*

The school wide adoption of iPads began in September 2014 and was met with mixed reactions from the staff. While some colleagues expressed strong feelings against the introduction of iPads, there was a general openness to receiving training to try and improve their integration. The literature on 1:1 technology adoption emphasises the need for more professional development for teachers identifying the lack of training as a barrier to them enhancing student learning (Hallissy et al. 2013, Pegrum, Oakley, & Faulkner (2013). At the beginning of the phased in iPad adoption we had a training day and a follow-up workshop at the start of the second year. This was helpful but was limited in scope. The training did encourage creative approaches, which I appreciated, but we had to get to grips with the basics first. It would have been beneficial to have more training prior to their introduction and a

second day during the school year to ask questions based on our experiences to date would have been very helpful.

The student perspective is an important factor influencing the eCulture. As Crevier (2012) suggested, technology itself is not a motivating factor for students, rather it is how it is used. The single biggest motivating factor for the introduction of student iPads in my workplace was to reduce the weight of the student school bags. With this as a starting point there was a lack of discussion around the educational possibilities of these devices in the classroom. The IT co-ordinator gathered teacher and student feedback at the end of the first year of our 1:1 adoption. This provided useful background information on my workplace eCulture. Extracts from this feedback are seen Table 4.2. The following extracts show that students mainly expressed the practical benefits of the iPads, saying they were good for looking things up, communicating or that it alleviated the burden of carrying books.

• "It's good for looking up things when you are studying or if you missed out on taking notes. If you are at home you can just look up anything you need help with". (Student AM10)
• "I like it that you can have loads of different apps, like flash cards or mind maps and you can type up your stories on it. This saves printing hard copies of everything". (Student AM6)
• "It's easier to communicate with our teachers". (Student AM1)
• "It's easier on our backs. Everything is on the iPad" (Student AM20)
• "I like it that if you are studying outside your house you don't have to carry many books when you are studying more than one subject". (Student AM11)
• "It's really handy to have messaging and email on the iPad in case you forget a piece of homework. It's also handy to be able to get apps like PicCollage to help with our work". (Student AM18)
• "Sometimes the teachers don't let us use them in class when it would be easier to use them". (Student AM13)
• "I find it hard to study, take notes, highlight and retain information off them". (Student AM19)
• "There's a lot of responsibility like if they break, get wet, fall it's a lot of money wasted". (Student AM2)
• "They run out of storage too easily so you have to delete things you might need for something else". (Student AM21)
• "It's hard to flick though pages, I prefer studying off books". (Student AM7)

Table 4.2: Student feedback on iPad adoption at end of year 1

The student feedback lacked any mention of creative or collaborative work, which

further motivated me to take action to change this.

A survey on the introduction of iPads was also carried out with the staff. Upon reviewing this feedback the response to a question comparing teaching and learning with traditional textbooks and the iPads stood out to me. With permission to share this response to our school survey I include it as evidence of the divided opinions among staff as seen in seen in figure 4.2

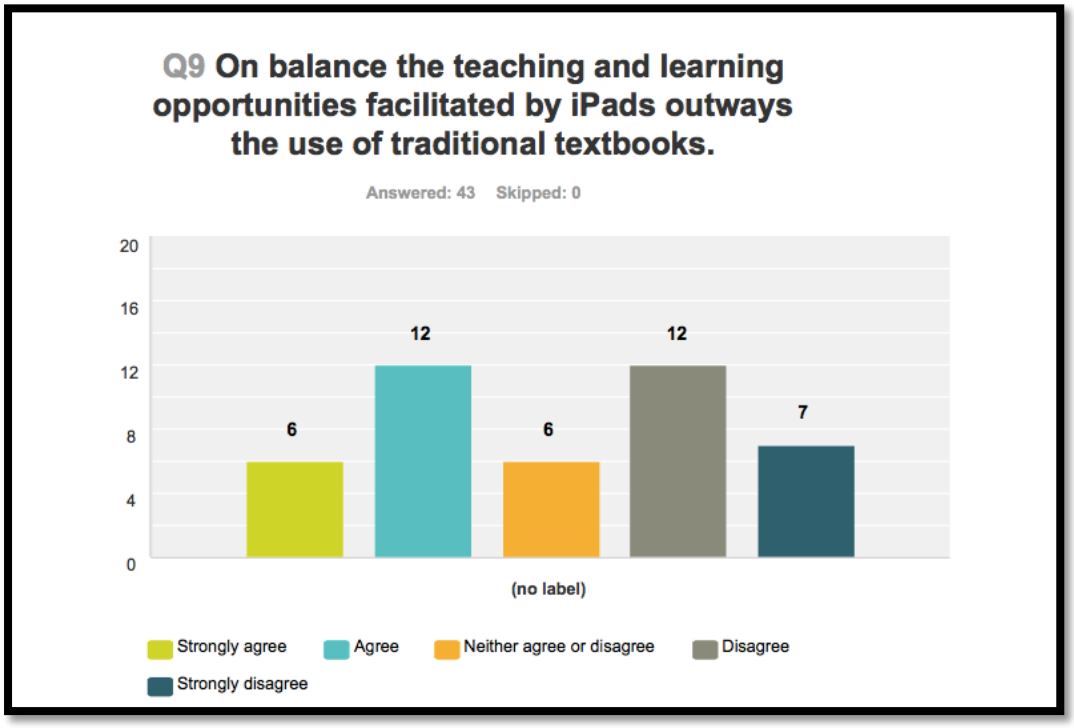


Figure 4.2: Staff feedback on iPad adoption

As a staff we really depended on each other as we began to experiment with the iPads and shared our experiences as we learned by trial and error. Among my colleagues I was able to identify 'champions' (Crotty 2014) who were open to embracing the new potential the iPads brought. These included the school IT co-ordinator and my colleagues in the RE department. Champions in a variety of subject areas shared their creative uses of the iPads as part of the first year feedback questionnaire. The following extracts show examples of some of the innovative ways my colleagues were embracing iPads from the outset:

"The use of iPads has been of enormous benefit to student learning in English this year. iPads allow students to access a huge variety of material online, including film and audio clips, blog posts and interactive websites. Students now produce their written work in digital formats and can safely and securely store their assignments in e-portfolios". (*Ann-Marie Ryan, English Teacher).*

"There has never been a more exciting time to be engaged in the teaching and learning of languages! iPads allow us to be transported to the country of the target language in a matter of taps. The language is brought to life in a way that has enhanced the process of language acquisition like never before. In one light & portable device, we not only have a textbook, dictionary and encyclopedia at our fingertips, but also a mobile language lab where students have the capability not just to hear the target language in use, but also to record themselves using it. Our students are now simultaneously acquiring the crucial skill of being able to be effective practitioners of another European language while being supported by technology every step of the way. iPads have revolutionised the way we teach and learn. The possibilities are simply endless". (*Jennifer Maverley German Teacher).*

"In P.E. iPads proved very helpful by allowing the students to video their movement and evaluate performance through video analysis ". (*Gill Crinion*, *PE teache*r)

All of our communication and collaboration began creating a new eCulture in our workplace that has helped shape my approach and understanding of iPad integration. While in year one of our 1:1 iPad adoption we felt unprepared, in year two the introduction of a school '*iPad Acceptable Use Policy*' provided better guidance for teaching and learning in a 1:1 environment. (See appendix N for a copy of our school policy). The third year of study showed how the impact of this research brought about further changes to our eCulture, which I will describe in chapter five. As the culture of our school around the use of technology continues to evolve the introduction of the *Classroom* by Apple app in 2017 has further addressed and improved issues surrounding classroom management. This app allows teachers to view student screens and lock them into an app. On a more positive note it facilitates easy sharing of material with students. This research, which was originally sparked by the introduction of iPads, has been carried out during an important time of transition with technology in my workplace. Throughout each cycle of action research valuable insights gained have contributed to the shaping of our eCulture.

4.2.1.2 The move to non-examination RE

The move to non-examination RE was a significant change for the RE Department. At the beginning of our first year teaching non-examination RE to first year students we collectively explored the opportunities and challenges we faced at our first meeting of the new school year on 28 August 2014. We identified four main areas to address:

> - The opportunity to take a more flexible approach to content
> - The opportunity for more faith formation
> - The challenge of keeping students motivated and engaged
> - The challenge of assessing non-examination RE
>
> (RE Department meeting minutes 28/08/14).

As we navigated the new direction we hoped to take we became aware of the gap left in our third year subject scheme of work where we normally completed the Junior Certificate journal title (DES 2000). We agreed to retain a research project component for in-house assessment. My research was informed by our collective vision for the move to non-examination RE and aimed to respond effectively to these opportunities and challenges. I formally invited my colleagues in the RE Department to be a part of my research at an RE Department meeting on 14 January 2015. I provided them with a Plain Language Statement of their potential contribution to my research and requesting Informed Consent for their participation (see Appendix J). All members of the RE Department were willing to be a part of the research. As we embarked on this journey as a department we collaborated to co-create our new curriculum. Those teaching junior cycle non-examination RE went on to pilot the curriculum with me. I also formally invited the twenty-four students in my first year RE class, the first non-exam group I taught, to participate in the first cycle of action research. The invitation was later extended to other class groups as the need arose as will be outlined later in this chapter. Student feedback and ideas proved an important insight into the exploration of motivation and engagement in non-examination RE as well as technology suggestions and solutions. These will be included throughout this chapter.

4.2.1.3 Reaffirming my values and passions

The first stage of the EEA facilitated a process of searching for, discovering and articulating my values of creativity, collaboration and courage as outlined in chapter one. Unearthing my values also reignited my passion for technology as I reflected on how it can enhance creativity and collaboration. Whitehead and McNiff (2006) advocate understanding our values as our standards of judgement asking to what extent we show that we are living in the direction of our espoused values. Upon reflection of my workplace practice I identified a lack of application of these values in my work. I could relate to Whitehead's (1989) description of experiencing oneself as a "living contradiction" where a conflict occurs between the aspirations of one's values and the reality of one's life and work practices. As evident in the previous section I endeavoured to collaborate with my colleagues and students in my work by inviting them to be a part of my research from the outset. However, I was disappointed to observe a lack of creativity in my use of technology in the teaching of RE. My initial use of the iPads mirrored what the literature indicated to be a common starting point in iPad adoption, reducing the iPads to an eReader (Hallissy et al. 2013). The training day we had prior to the iPad adoption was limited and didn't include anything on the use of iBooks. There was nothing exciting about the eBook version of the RE textbook, with no obvious additional or interactive features. In spite of this I found using it a big adjustment, noting that 'it was intimidating to go into a class feeling unsure of what you are doing' *(Journal entry extract, 04/01/14)*.

In my previous role as a 'Digital Specialist' in Veritas I provided training for teachers on the use of technology and I developed interactive websites for RE. I have always valued the potential that technology has for education when used well so I questioned why I was struggling to use it effectively in my own teaching. Sharing my concerns at a validation meeting with my supervisor, Dr. Crotty in DCU on 25 February 2015 she felt that I was being too hard on myself, pointing out that my passion for the creative use of technology was evident in my conversations with her. However, the challenge was to bring this into my teaching. Following Dr. Crotty's advice I began to further reflect on my value of creativity and came to the realisation that I have often struggled to see it in myself.

> Once again, I seem blind to my own creativity, struggling to see it without others pointing it out. There is always vulnerability in creativity and I am quick to shy away from it… I can still recall Dr. Elaine McDonald, my teaching practice supervisor during my undergraduate degree in MDI telling me that I was creative and later Maura Hyland, the director of Veritas, told me the same thing and encouraged my creative use of technology. They saw something in me that I had been blind to, and helped me to see it for myself. My appreciation of this value is deepened by the fact that I have struggled to fully embrace it and I am grateful for this opportunity to reaffirm my creativity *(Journal entry extract, 26/02/15).*

This journal entry encouraged me to embrace vulnerability as an opportunity to live out my value of courage. It also showed me the importance of being open to listening to others and learning from their insight. This was a fundamental component of my other value, collaboration and the EEA's collaborative nature (Crotty 2014). I could now see how my journal was becoming an important place to record the feedback of my co-creators as well as my own perspective on the research.

The SAMR framework (Puentedura 2006) would categorise my initial use of the iPads at the most basic level of substitution. In the early phase of 1:1 iPad adoption I often didn't even reach that basic level as I taught topics on autopilot, doing what I had always done without much consideration for the new devices. A moment of clarity came unexpectedly and I reflected upon this in my journal:

> After asking students to write down five facts they would like to find out about the life of Jesus one student asked me if Jesus had a surname and what it was. I told her to wait so we could go through all the questions and answers together to which she replied, "you know we have iPads here don't you." In that moment she just wanted to look up the answer but her words really resounded with me. As the lesson progressed I was showing the students a map of the Holy Land when I noticed one student on her iPad. In response to my inquiry about what she was doing she announced that she was "just checking out Nazareth on Google Earth." I was impressed with her initiative but equally uncomfortable that she did it without asking. Today was a wake up call. It was interesting to notice my own discomfort with student initiative. Was the problem that she didn't ask or that I just felt a loss of control? And the question "you know we have iPads here don't you?" seems to be at the heart of things. I hadn't thought about what I could do differently with the iPads and I slipped into my regular teaching plan for this topic. *(Journal entry extract, 08/01/15).*

Upon reflection it was evident that my lack of integrated planning for the new context in which I was teaching was the problem. Conversations with my colleagues revealed similar experiences. Our practice mirrored what the OECD (2015) report concluded; that the presence of ICT in a school does not equate to its effective use. It is clear to me now that in the beginning the very presence of the iPad had become an unpleasant dominant force in my thinking. By the end of the first year, any time we used the textbook, I would read from the physical book while the students read from their iPads. If I saw the iPads as an eReader then I could have concluded that they have failed and we may as well say goodbye to them. However, I aspired to take action and make changes to my practice. The key to achieving this was revisiting my educational values. Through the reflective journaling practice established at the beginning of this research I clarified my educational values and they became the guiding principles for this work. Upon reflection I decided that I not only want to embrace these values myself but my aim was to foster these values with my students encouraging their collaboration and creativity through the use of technology.

4.2.2 New ways to collaborate and communicate

In the transition to a 1:1 iPad classroom I had the opportunity to develop new ways of collaborating and communicating with my students. According to Hamman and Ashcroft the Virtual Learning Environment (VLE) is dead (2016) especially when there are so many informal free alternatives, including social media. Within my work context there is no official online platform or VLE. The advantage is the freedom to choose whatever platform you wish, however, the disadvantage is students potentially having numerous platforms and passwords to navigate. Perhaps due to this freedom I did not settle on one but rather explored a number of platforms. I will now explore the main four platforms that I used in turn:

- Twitter – a social media account to add real world relevance and connection to a worldwide community in my classes
- Edmodo – a safe space for students to share work and ideas online
- Showbie – student preferred tool for uploading assignments
- Padlet – a virtual wall for sharing ideas and resources

4.2.2.1 Twitter

During my time working at Veritas I managed a number of their social media accounts. This experience showed me the potential of connecting and collaborating with the wider world and my personal Twitter account @ailis_t was a valuable source of inspiration for this research. I began to understand how my social media skills could enhance my teaching and I set up a separate Twitter account to use with my students, @mstraverstweets. This added a new 'real-time' dimension to my lessons as it raised awareness of what was happening outside the classroom walls, see figure 4.3 for an example.

Figure 4.3: A sample Tweet from @MsTraversTweets

Motivated by my exploration of the literature on a Christian presence in the digital world and reflecting on Ferriter's (2013) work, I was reminded of all the suggested 'right answers' to what we should want our students to do with technology. These included raising awareness, taking action and driving change (Ferriter 2013). Twitter helped me connect my lessons to the real world, in real time and that definitely added the potential to raise awareness. Using Twitter complemented by pedagogical approach of bringing 'life to faith to life' (Groome 1991). However, it was mainly limited to a place for gathering links to articles to share with my students. This worked well with senior classes that didn't have iPads but I needed to develop a more interactive approach for the 1:1 environment.

4.2.2.2 Edmodo

While social media is very useful at connecting classes to the wider world in a 1:1 classroom having your own online private space or VLE to communicate and collaborate is essential. On Edmodo students can have their own accounts and can interact with the teacher as well as collaborating with each other. Technology does not just allow students to have new learning spaces but allows teachers have greater flexibility. The *Edmodo* app on my phone allowed me to post material and check in easily at my own convenience. The students' first impression was very positive. It reminded them of social media, with one saying this was "the closest to Facebook they would ever get" (Student AM6).

Edmodo facilitated new ways of communicating. Online polls that could be answered anonymously allowed students to express opinions that they might hesitate to say out in class as seen in figure 4.4. When I posted this question asking whether or not they believed Jesus walked on water one student asked "but is it ok to say no?" (Student AM12). I was taken aback that she would be unsure of this but it was a good reminder that students sometimes might try to give us the answers they think we want to hear. In RE, when we have students of different faiths and none in front of us, it is very important that they know they can freely express their opinions.

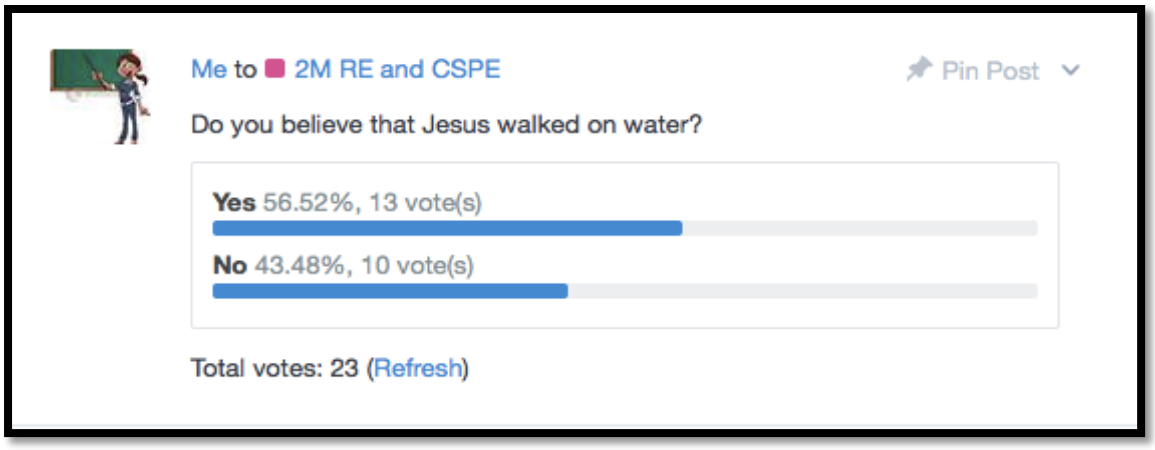


Figure 4.4: A poll on Edmodo – gathering student opinion

When students feel respected and are comfortable sharing their opinions it helps to open up discussion and move material in a more meaningful way for them. *Edmodo*

helped achieve this as students can interact with each other in a safe online environment as seen in their online discussion in figure 4.5.

Figure 4.5: Student discussion on Edmodo

Our "religious Facebook" (Student AM2) proved popular. Unlike other platforms, Edmodo is more than a place for teachers to post assignments. It helps students learn how to interact, facilitates collaboration and helps students have ownership of their learning as they can access shared resources. *Edmodo* was also useful for students who did not have their own iPads because it could easily be accessed at home and some students put the app on their phones. The main disadvantage was that it was not widely used across the school community to fully integrate it into our eCulture.

4.2.2.3 Showbie

In spite of my preference for *Edmodo*, feedback from the students working in a 1:1 environment indicated a preference for Showbie, an app that they found easy to upload their digitally created work to. "It is easy to use because you always know when and where to upload your work" (Student AM17). This was an app introduced to the staff at our training day and therefore was used by a number of my colleagues, which increased student knowledge and confidence in using it. I was happy to take on board the student feedback and integrate this app into my 1:1 classes. The use of shared folders on *Showbie* allowed me to share files from my computer and Google drive with students. Teachers can communicate with students by typing posts or leaving audio notes. These can be used to give feedback on the work students upload, facilitating the move to a paperless classroom for digital activities as seen in figure 4.6. One student pointed out another advantage of *Showbie* stating, "I prefer getting comments on *Showbie* because sometimes handwriting is hard to read" (Student AM23).

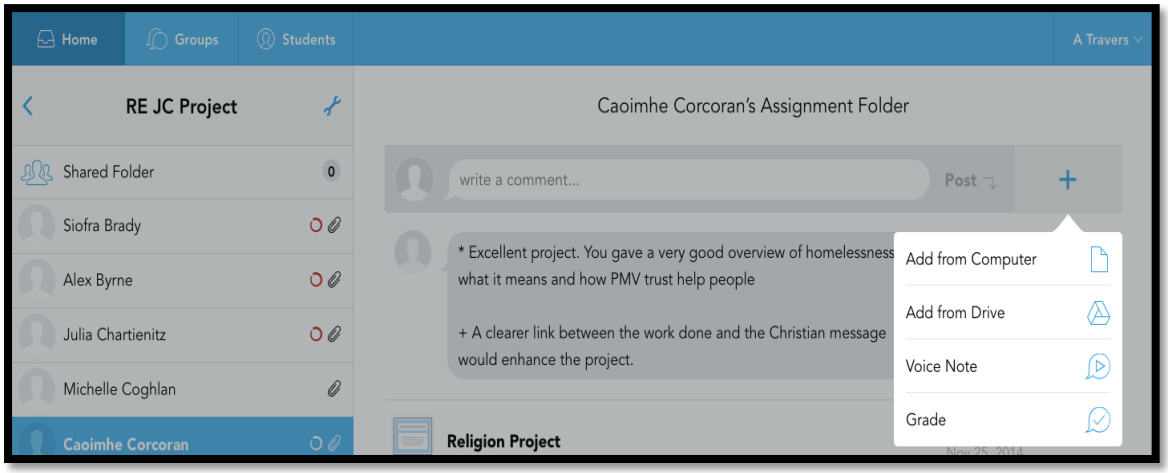


Figure 4.6: An example of collecting assignments and giving feedback on Showbie

A simple but effective use of this app is to type class instructions into the shared folder. Figure 4.7 is an example of a lesson on 'Our Carbon Footprint' that I developed as part of the module on Stewardship. Posting a link to Trócaire's 'There is no Planet B' video, which is fifteen minutes long, allowed me to assign the video as homework, leaving more time in class for group work. This idea of the 'flipped classroom' (Bergmann and Sams 2012) highlights the possibility of technology for

facilitating more face-to-face collaboration. With a renewed emphasis on collaboration in my classes, developing good group work practices was of paramount importance. Using technology helped me to improve my practice, as I was able to share the roles and instructions with everyone, reducing the need to repeat them during the group activity. This use of technology allowed me to seamlessly integrate the group work pedagogy with the content.

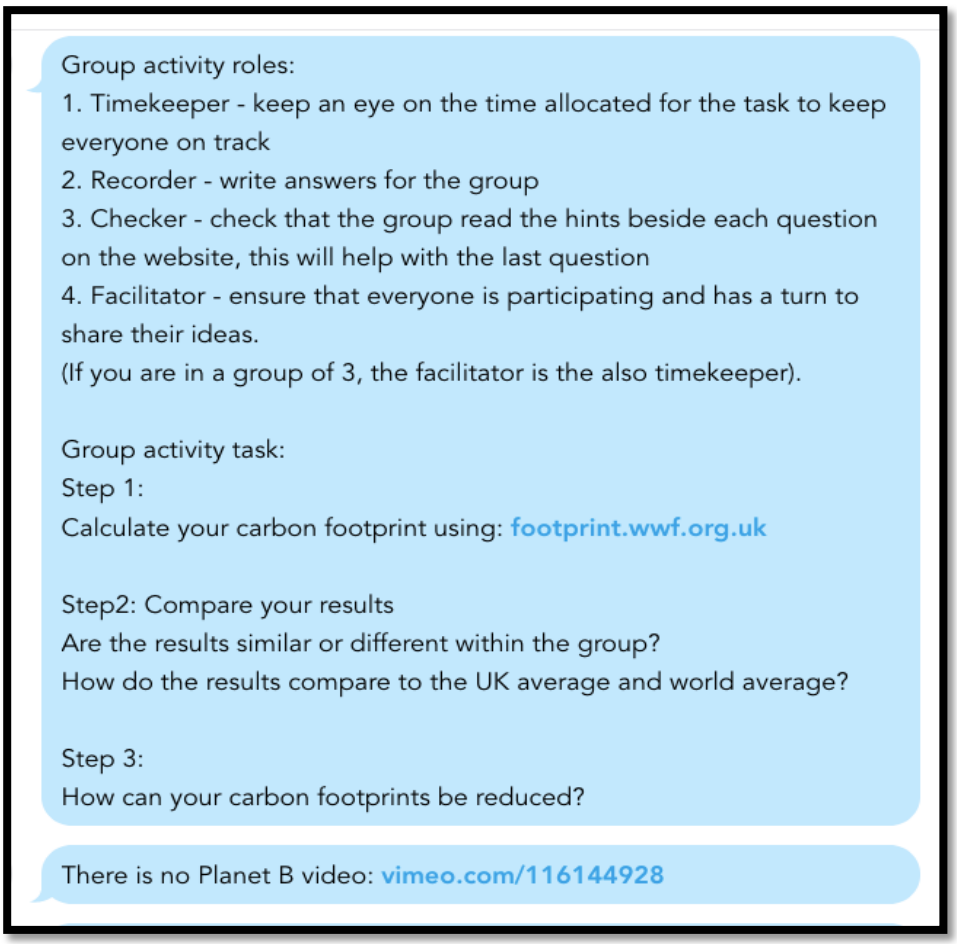


Figure 4.7: Using shared folders on Showbie to create an integrated lesson

To fully utilise the range of features on *Showbie*, including an ePortfolio option, a paid version of the app is required. This would only be cost effective as a whole school license. However, in spite of only having the free version, *Showbie* helped me to establish a new digital workflow in my 1:1 classes. It is now the platform used for students to submit their completed 'Digital Disciple' activities and finished iBooks from the *Wonderlands* curriculum.

4.2.2.4 Padlet

A Padlet is a virtual wall that allows people to write comments and upload files, images and links. Students can all type on the same wall at the same time and see what each other are saying. Figure 4.8 shows an example of a wall we used to prepare questions for a guest speaker, Sr Ríonach.

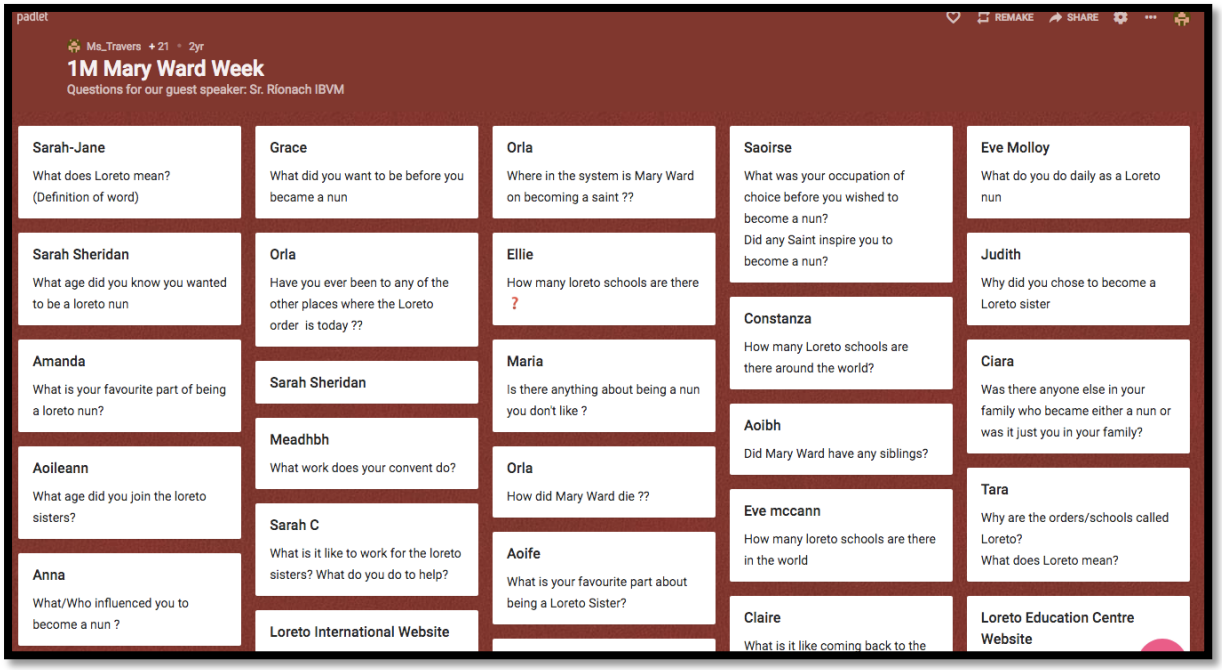


Figure 4.8: Collaboration on a class Padlet Wall

The student reaction to *Padlet* was very positive, "It was deadly being able to see what I typed on the screen and see everybody else's questions. It helped me think of more questions and our interview planning went really well" (Student AM14). To write on a shared class wall students don't need any app or password; they simply need the link to the teacher wall. However, if students do have an account *Padlet* can become a useful platform for student presentations and small group projects. My colleagues were also impressed with how easy it is to use, "A virtual wall sounded complicated so I was pleasantly surprised at how straightforward it was to use" (Colleague A). From my exploration of new ways to collaborate *Padlet* is my favourite due to how quick and easy it is to set up and use. It is featured as a suggested tool throughout the *Wonderlands* curriculum.

4.2.3 The potential of iPads for content creation

The RE department explored a variety of digital and multimedia applications to begin to make the move from being consumers of content to creators of content. This cycle of research was a great opportunity to enhance and broaden our technical skills as we learned from each other and from the students. Utilising the built in camera and video on the iPads as our starting point we focused on:

- Using PicCollage to design collages and posters and enhance photos with background and text.
- Using Animoto to create digital stories
- Using iMovie to record and edit videos
- Using QR Codes to create a virtual stations of the cross experience that students could access via a QR code scanner

4.2.3.1 PicCollage

PicCollage was an app introduced to us at our initial training day and was on all the student iPads. It is very simple and easy to use and therefore was the ideal starting point for content creation. We decided that we would get the students to create a collage representing all of the communities that they belong to. This worked very well and when we shared our experiences at an RE meeting we concluded that:

> - It is easy to use and students enjoy it.
> - It takes a lot less time than we anticipated to complete
> - Some students may put more effort into the design than the content
> - Some students only add images so clearly instruct them to add text as well if it is required.
>
> RE Department meeting minutes (06/10/14)

The novelty factor of the new iPads perhaps accounted for the technology overshadowing the content at the early stages when students spent more time playing around with the design than the content. However, this app is the most popular and regularly used by students and is one that is equally popular among staff. Figure 4.9 shows a student created *PicCollage* about Pope Francis.

Figure 4.9: A student created PicCollage

4.2.3.2 Animoto

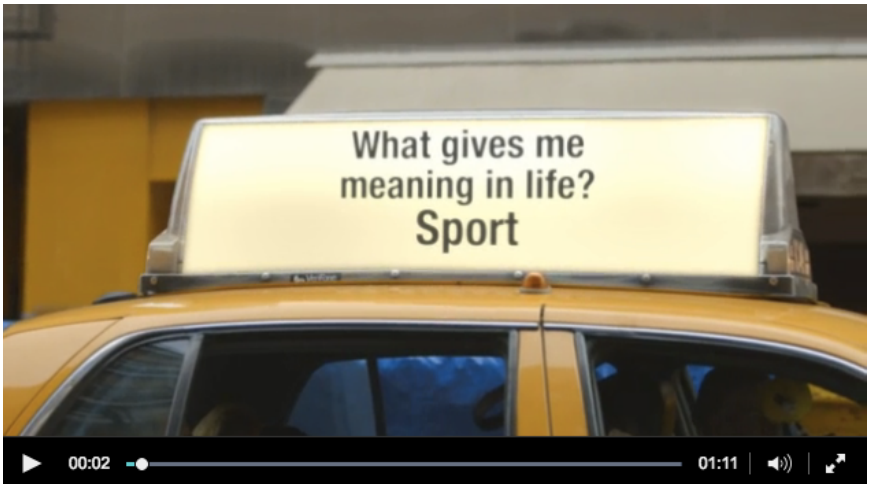
Animoto is a website and/or app that allows users to make digital stories. A digital story is a video made with photographs, text and music. It has been one of my favourite apps to use since I discovered it during a technology workshop with Dr. Enda Donlon and I often showed teachers how to use at workshops I presented during my time in Veritas. As an app I am very familiar with I decided using it would be a good way to model responsible content creation for my students. I created an *Animoto* video to celebrate the life of Mary Ward, the founder of the school. See video 4.1.

Video 4.1 Mary Ward Week

The students' response to the video was overwhelmingly positive. This in itself wasn't surprising as there is an abundance of literature that describes students today as being more visually literate than any previous generation with a strong preference for image-rich environments, especially video and music (Prensky 2012, 2001, Carr 2010, Tapscott 2008, Oblinger and Oblinger 2005). However, my journal provides evidence of further insight gained from this experience:

> The students loved the *Animoto* video. What intrigued me was their shock upon learning that I had made it myself and how impressed they were with my editing skills. I had assumed that they would know how easy it is to make digital stories. I began to comprehend that while my students may be constantly on digital devices they don't automatically have the knowledge and skills for content creation beyond what they share on social media. *(Journal entry extract, 28/01/15)*

This insight motivated me to spend a class teaching the students how to make their own digital stories. As a result it has become a regular feature in my classes. It aligns with my value of creativity as it allows students to engage imaginatively with the subject matter. See video 4.2 for an example of a student created video.



Video 4.2: What gives meaning in life?

Introducing students to Animoto was an important step on their journey from consumers of content to creators of content (Johnson et al. 2015) as the website provides copyright free music to accompany videos and thus opened up an important conversation about copyright and ethical content creation.

4.2.3.3 iMovie

Traditionally, when teaching the parables of Jesus to first years I get them to act it out or do a role-play of a modern version of the parable. In my first year teaching with iPads I continued to teach as I had always done. It was my colleague Aoife who decided to use iMovie to record her class role-plays. Inspired by her idea, I decided rather than going back over the parables I would get my class to use *iMovie* to make films about the miracles of Jesus. This last minute change in plan resulted in some valuable lessons in facilitating student content creation:

- Learn from those who know - I had never used *iMovie* before but this didn't matter as the students were confident that they knew how to use it or could figure it out. All successfully completed the task without needing technology guidance from me.
- Be aware of what apps are on the student iPads - Not all of the students had *iMovie* on their iPad, which I was not aware of until we were beginning the project in class. We managed to have six students with it and they became the six group leaders. The following day one of the group leaders was absent, leading to further complications and that group had to use my iPad.
- Give clear instructions - My lack of expertise in facilitating this kind of content creation became apparent when I didn't give clear instructions on how long the film should be or what I was looking for so some groups had a short trailer style video while others had a longer movie and one group had both.
- Encourage quality production - Technical hitches were evident as the sound was hard to hear in some of the movies and this really took away from the students learning from each other. Students need to review and edit their work before sharing it.
- Give students the marking scheme - The importance of having a proper rubric so students know how it is being marked became evident.
- Plan ahead - Other practical issues for this kind of project became clear, for example, it is not possible to film six movies in the classroom at the same time. We filmed in the assembly hall and canteen so students could spread out and film without interfering with each other and this worked but these

spaces are not always free so extra planning and preparation is needed for this type of activity.

- Accidents happen - One student smashed her iPad screen while filming, which made me question if all the hassle for this type of activity is worth it.
- Share the finished product – the highlight for the students was the class where we watched all the movies and the anticipation of this created heightened excitement during film production.

After seeing the excitement and enthusiasm from the students when we watched the movies in class, I would have to say this was a very worthwhile activity. Students worked in groups of four and their feedback was overwhelmingly positive about this assignment with students saying “that was awesome” (Student AM3) and “when can we do another one?” (Student AM8). I was impressed by both their creativity and collaboration in this project. They were very engaged throughout as they planned their scripts, rehearsed before filming and some even used their own initiative to bring in props. The activity seemed to reinforce the learning and it was interesting to note that the students answered the question on miracles in their summer test really well. On reflection the weakness with this activity was my own lack of clarity as to what was possible and what I expected. This was an important learning curve in my research journey that I was able to take these new insights into consideration when creating my curriculum.

Figure 4.10 Students making an iMovie

4.2.3.4 QR codes

At our RE department meeting it was decided that we should include an opportunity for faith formation in non-examination RE by marking the season of Lent (RE Department meeting, 14/01/15). I suggested creating a virtual Stations of the Cross experience using QR Codes. A QR code, (quick response code) is a barcode that can be scanned to send or receive information. They have been around for years but are only becoming relevant in education now that students have access to smart devices. I designed posters to represent each Station of the Cross and hung them around the school. For each poster I created a QR code that the students could scan with the QR code scanner on their iPad to bring them to a video reflection on that station. While I created the posters, my colleagues wrote reflection questions for the students, arranged a timetable for the classes taking part and set up the sacred space in the oratory. We communicated our plans to the principal to ensure that we could have the students scattered throughout the school and with all of this support and effort we succeeded in achieving a unique learning experience for our students.

Students gathered in their class group in the canteen as a starting point and we gave them some background material and questions on the topic to prepare them. We divided them into small groups and staggered their starting times. This allowed students to move around the school quietly and gave them enough time to pause and reflect at each station. Students then moved throughout the school to find each poster, virtually following in the footsteps of Jesus. The last poster led them to the school oratory where candles were lit and music played.

Figure 4.11 Virtual Stations of the Cross

This was our first experience of successfully creating an integrated lesson with content, pedagogy and technology, working together, as the TPACK framework envisions (Koehler and Mishra 2012). Students were asked for feedback afterwards with one saying, 'that was really sad what happened to Jesus, I didn't know the details before (student AM16) and another noted, 'I liked how the videos made a link between Jesus and our life today' (student AM4). My colleagues and I were impressed that their feedback focused on the content, proving that the movement or the technology did not distract them from the lesson objectives. The success of this activity was possible because the whole RE department collaborated and planned everything in advance. We had thought about possible distractions and deterrents. We were clear on our aim of wanting a reflective and prayerful atmosphere throughout. This activity also had an unexpected impact on the wider school community. By stepping outside our classroom walls we were automatically sharing ideas, starting new traditions and opening up new conversations. The school website included an article on it and it was mentioned in the principal's end of year reflection and the parent newsletter showcasing the highlights of the first year of 1:1 iPads in the school. This experience gave me a renewed enthusiasm for trying new digital tools and reassured me that I was motivated enough to follow through on the commitment required to design a quality artefact or curriculum (Crotty 2014).

4.2.4 Technology tools for assessment

The OECD report quoted Livingstone's (2012) recommendations for ICT integration that included the redesign of "curriculum structures and materials, classroom practices and modes of assessment" (p.22). Beginning with the end in mind, we started with the new modes of assessment. Drawing on my 'Technological Pedagogical Knowledge' (Mishra and Koehler 2006) I knew there were useful technology tools that could enhance my approach to assessment. Agreeing with Williams (2013) observation that any assessment can be formative assessment, my focus was on the function that the assessment serves. Carrington's (2015) '*Padoagogy Wheel*' as discussed in the literature review and illustrated in Appendix E helped me to evaluate the variety of technology tools available to incorporate assessment into my curriculum. During the research Donlon's Project 252, a crowd sourced list of educational technology, was developed.

This provides a large alphabetical list of technology tools with clear descriptions of what each one can do (Donlon 2015). From my exploration of the available options the two main tools that I selected to use were:

- *Kahoot* – for fun assessment games
- *Quizlet* – to help students study and test themselves with online flash cards

4.2.4.1 Kahoot and Quizlet

Kahoot is a website that allows users to create multiple-choice quizzes. Students do not need an app; they simply go to https://kahoot.it/ and type in the pin that the teacher game has generated. Figure 4.12 shows the teacher screen that can be projected in class alongside the student screen that allows them to respond to the questions. Click on figure 4.12 to access a *Kahoot* that I created.

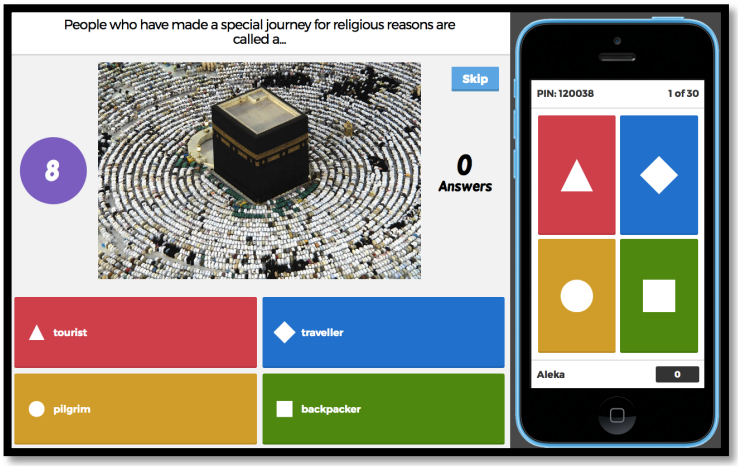


Figure 4.12: A preview of teacher and students screens during a Kahoot quiz

The more recent development of a *Kahoot* app has further enhanced its usefulness as now a *Kahoot* quiz can be sent as a challenge to students for homework. *Kahoot* is very popular with students as evident in the following extract from my journal:

> *Kahoot* brings out the competitive spirit in the students and is the perfect way to test prior knowledge or recap on a topic. Fun and enjoyment are not generally closely associated with assessment practices but *Kahoot* managed to achieve this as is evident from student requests to 'play' it. This is by far the most popular form of assessment I have ever given with students regularly requesting to use it *(Journal entry extract, 20/05/15).*

Quizlet is a website and app that facilities learning by allowing users to create study cards for key words. This is particularly useful for the RE syllabus which contains 276 key concepts (DES 2000) and was useful to help students assess their knowledge of the glossary for the curriculum. It helps students learn the concepts using virtual flashcards and offers a variety of activities for them to test themselves as seen in figure 4.13. Click on figure 4.13 to access a sample study set I created.

Figure 4.13: Quizlet study set

Figure 4.14: Students engaging with Quizlet live

Quizlet live is a newer feature that facilities team quizzes to revise the study cards. Figure 4.14 shows students actively engaged in the quiz with the leadership board displayed on the board. As I strive to facilitate student collaboration this feature is an ideal tool as it automatically creates the groups and easily shuffles them. It ensures that all students have to participate by presenting different answers on each student device with students having to communicate to figure out which student has the right answer. Mindful that technology should not replace physical communication I feel that this app achieves a happy medium. The group quizzes further motivate the students as they race against other groups to win.

4.2.5 Reflecting on my explorations

On completion of the first phase of the EEA I had reaffirmed my core values and had already experienced an improvement in my practice. In work I had experienced a newfound positive attitude towards the use of technology where the eCulture was definitely changing for the better. My passion for the use of technology in education was reignited. From my multi-tiered exploration of my values, workplace culture and

the literature, I was confident in my assertion that I was well placed to innovate further change. The second stage of the EEA provided the opportunity to synthesise these findings in order to understand what I could do.

4.3 Understand

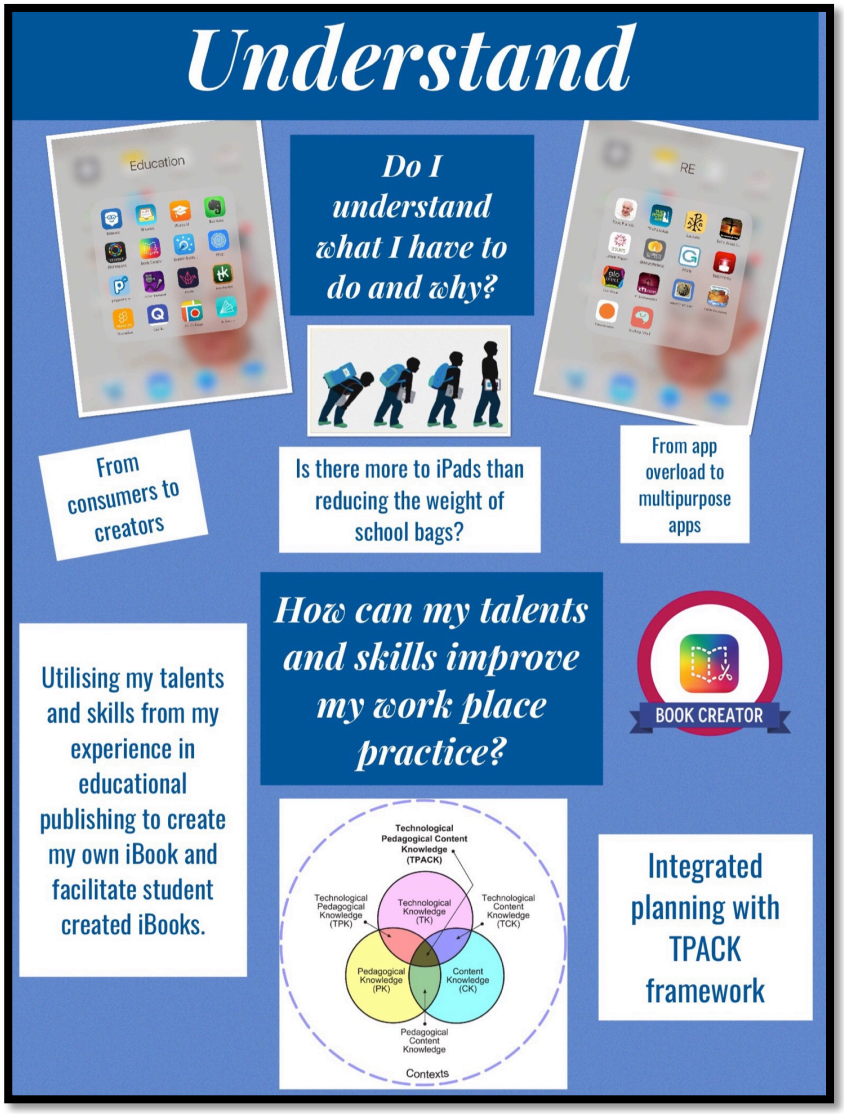


Figure 4.15: An overview of the research during the Understand stage

4.3.1 How can I implement TPACK to improve my practice?

In the 'understand' stage of the EEA the researcher must ask how his or her talents or skills can help improve their workplace (Crotty 2014). Crotty (2016) suggests a focus on digital, multimedia or other creative skills that can enhance workplace practice. Having explored and identified numerous skills in the first cycle, the focus

shifted to understanding how I could begin to better integrate them by following the TPACK framework (Mishra and Koehler, 2012, 2006). As the literature review pointed out the TPACK framework is now well established with a focus on using it in both research and development projects (Thompson & Schmidt 2010). For this reason I felt it was the most appropriate choice for a theoretical framework upon which to base my curriculum. It also appealed to me that this framework had already moved into its second generation by the time the iPad was invented, proving that it would be useful framework to help integrate any other technology available now or invented in the future. The literature informed me that developing TPACK occurs as part of your daily activities when you begin to gradually try to integrate the three in tasks that you are already doing (Hofer and Harris 2015). In order to fully understand how I could do this a second cycle of action research was carried out in the 2015/2016 school year. My awareness of my progress was again recorded in my journal, while I also recorded the feedback of my colleagues and students and gathered evidence of our creativity and collaboration. The systematic documentation of our progress allowed me to reflect on our experiences to crystallize my ideas and clarify my thinking, which resulted in my seeing how I could develop an integrated curriculum.

4.3.2 The rationale for student created iBooks

Embracing the collaborative nature of the EEA I sought to understand the perspectives and potential concerns of all the collaborators in the research (Crotty 2016). An emerging concern was a general sense of being overwhelmed by all the possible apps available or what I referred to as 'app overload'. As my colleagues and I discussed our confusion regarding which apps were worth using, the literature helped me understand that we had to change our focus from what apps we wanted to use to asking how and why we wanted to use technology (Hannam and Ashcroft 2015, Ferriter 2013). We had clearly established that we wanted to use technology for content creation and collaboration. Furthermore, we had decided that the Junior Certificate Journal Work should be replaced by an inquiry based research project. Following the guidelines from the understand phase of the EEA I reflected on my talents and skills to identify how they could help bring about these changes. This time I looked to my experience as a published author. Authoring (and publishing) a book is one of the most empowering things a person can do. Helping my students

become authors was an ideal focus for an inquiry based research project that centred on content creation and collaboration. I shared my rationale for the move to student created iBooks with my colleagues on 28 August, at our first RE meeting of the new academic year:

> - The focus is on content creation and collaboration
> - Books created become a record of student work, like an ePortfolio
> - The possibility to use a wide variety of media in the book – including images, audio and video.
> - Helps students understand what it means to be a writer and how to edit their work
> - Develop student literacy skills, in line with our School Improvement Plan (SIP)
> - Allows students to express themselves, demonstrate learning, and creates meaning for them
> - Engage students by making them responsible for their own learning
>
> *(RE Department meeting minutes 28 August 2015)*

At this meeting it was agreed that our focus for the third year research project would be student created iBooks and that we would pilot the project this school year.

4.3.2.1 Book Creator: one key app to foster creativity and collaboration

The clear focus on why we wanted to use technology helped us decide to focus on one key app for this research cycle:

- Book Creator - for student created iBooks

I came across the *Book Creator* app via the Twitter #edchatie community during the summer of 2015. In spite of already exploring numerous apps for content creation this one instantly drew me in. The *Book Creator* app makes eBook creation easily accessible to students. The move to student created eBooks is becoming a popular educational trend. One of the Irish *Book Creator* Ambassadors and an Apple

Distinguished Educator, Cormac Cahill, was a great source of inspiration when I came across iBooks that he created with his students in a special needs unit in a primary school in Cork. (See figure 4.16)

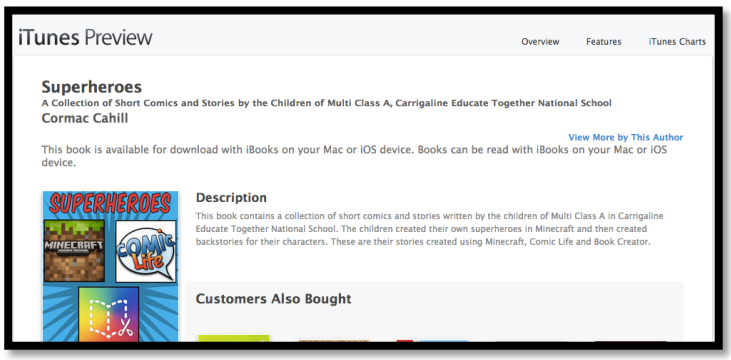


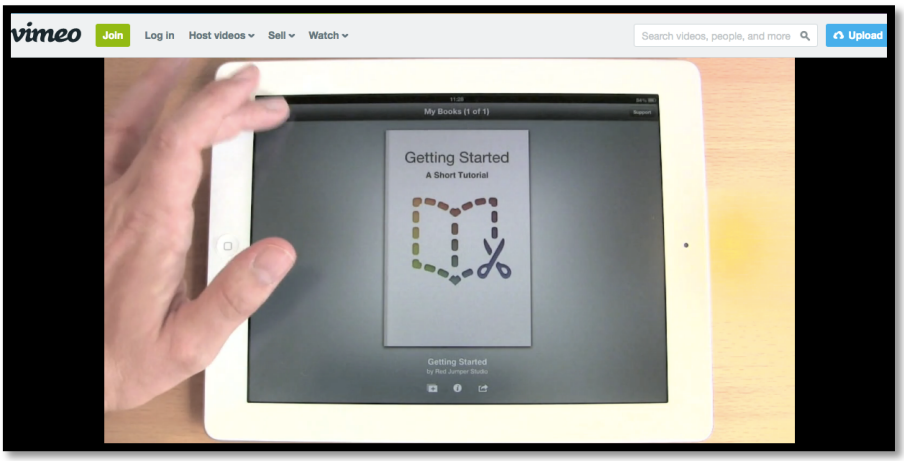
Figure 4.16: iBook made by primary school students available in the iBook store

Seeing what primary school students could achieve with this app reassured me that it was simple and easy to use. As the literature pointed out every app is limited but these limitations can be overcome by 'app smashing'. This is "the process of using multiple apps in conjunction with one another to complete a final task or project" (Kulowiec 2013). The *Book Creator* app can be 'smashed' with a wide variety of other apps and websites, which allow students to create content on numerous other platforms and then insert them into their iBook. At our RE meeting on 28 August 2015 I listed the reasons why I felt *Book Creator* should be our key app:

- Simple (but with potential to be as complex as you need)
- Easy to navigate, self-explanatory
- Possible to merge books and collaborate
- Can annotate and draw on the books
- Can import videos
- Can add audio to give every student a voice
- Ability to app smash – so can insert content created on other apps.
- Can export as ePub, which is a universal format

(RE Department meeting minutes 28 August 2015)

I also shared the *Book Creator* introductory video (See video 4.3) with my colleagues, which reassured them that this was a very user-friendly app.



Video 4.3 Book Creator tutorial

With my colleagues agreement to focus on student created iBooks using the *Book Creator* app we set out to develop and pilot a new approach to non-examination RE with the intention to have it ready for the first non-examination third year RE class the following year.

4.3.3 Learning with limitations and overcoming obstacles

As the purpose of the *Wonderlands* curriculum was to replace the time spent on the Junior Certificate Journal it had been decided to design it around a research project. Inspired by what the literature identified as 21st century skills (Partnership for 21st Century Learning 2015), the project was designed to encourage critical thinking, communication, collaboration, and creativity. The aim of the curriculum was for students to create, communicate and collaborate to publish an iBook that celebrates places of religious significance. The first iteration of the curriculum was solely based around the student project as the focus was on students moving from consumers to creators of content. In order to ensure quality in my curriculum design and in my research plans I worked closely with my colleagues in the RE department and we piloted the developing curriculum with a number of class groups. This provided valuable feedback that helped improve and shape the curriculum. We encountered a number of problems and setbacks, but these were valuable learning curves on the research journey.

We couldn't use the curriculum with our current third years as they were preparing for the Junior Certificate exam so initially we decided to pilot the curriculum with the year group ahead of them, a group of Transition Year (TY) students. A straightforward plan on paper became complicated in the midst of a busy school environment but from the limitations we faced we learned valuable lessons. We encountered two significant problems. First of all we did not have enough class contact time with them as the TY students only have two RE class periods a week. Furthermore, due to the unique nature of TY, students go on work experience, community care projects and a variety of trips throughout the year missing a number of classes. This made group collaboration difficult and slowed down our progress. The second factor was that this group did not have their own iPads so we were depending on booking the school set. We used the computer room instead for a lot of the research and mainly used the iPads for filming interviews. The biggest issue with using the shared iPads only became apparent when we discovered that they only had the free version of the *Book Creator* app on them and that it only allowed one book to be created. In the end the TY students had completed great research and created valuable original content but they were unable to complete the iBooks as we had planned. This was disheartening at first as I noted:

> I'm very frustrated with the lack of progress at the moment. Everything seems to be going wrong. We have missed classes and when we had class some students were missing and some groups were left with only one or two students. The iPads are not always available when we need them (even though we had booked them!) and sometimes they are not charged. The free version of the app has caused confusion as it means each group has to use the same iPad each time as only one book can be created on them. One group said the work they completed disappeared from the iPad. Did they do it? Did they save it? Was it deleted? I don't know but I do know this isn't working. The project was supposed to be completed before the Easter holidays but they are here and no iBooks are completed. I'm going to use this much-needed break to try and figure out where to go from here (Journal entry extract, 02/04/16).

After I debriefed our first attempt with my colleagues it was reassuring to realise that the main problems encountered were due to factors that would not apply to the third year group the curriculum was being developed for, as we would have them three times a week and they would have their own iPads. Determined to see how the *Book*

Creator app would work in these conditions, I decided to use the app with the second year students that had already agreed to be part of this research when they were in first year. As we were coming towards the end of the year time was tight so the research topic was narrow and confined to one that they had background knowledge on. They had studied Islam and learned about Mecca as a place of religious significance earlier in the year. It was decided that for the project they would work in groups to create a book about one phase of the pilgrimage. Each book would then be combined to create a class book. There were six phases, including the background and preparation phase of the pilgrimage so they worked as six groups of four. They had one class to research their phase of the pilgrimage, one class to create original content in any format they wished and one class to compile their chapter in the *Book Creator* app. My colleague Laura also did this with her second year class to provide further feedback on the experience. This second attempt at piloting the project encountered some minor problems but the outcome was much better than anything I had expected.

4.3.4 Moving beyond expectations

With the iPad as their main technology tool, all of the tasks involved in creating their iBooks were undertaken on this device. Students had instant access to the Internet to begin their research. They were used to take notes, photos and record video footage. They had participated in my exploration phase of this research in first year so they were able to draw on the technology tools we had used and skills they had developed. The groups used *Padlet* to plan their project and share their progress. Using a variety of apps such as *Animoto* and *PicCollage*, students created original content. However, there were no restrictions on what technology they could use and I was particularly impressed with how they illustrated their iBooks with original artwork created on the iPad with the *Sketches* app. See figure 4.17. I was not familiar with this app but I was delighted to learn from my students and include it in the final draft of the curriculum.

Figure 4.17: Student created illustrations using iPad

Creating their own iBook was a big learning curve for the students and it gave them the chance to develop new skills. They appreciated the autonomy they were given in their plans and approach for the project. However, they struggled when learning about the issue of copyright for images. They had never been challenged to think about this before and were a little disheartened to learn that there are not as many options when you restrict your search to copyright free images. As figure 4.17 showed one group overcame this by creating original illustrations on the iPads. Another group used their artistic talents to draw original images on paper and then took photographs of them to include in their iBook. The student experience reflected the Horizon report (Johnson et al. 2015), which identified a lack of research skills and the issue of copyright as the two challenges for digital projects. In light of this experience I began compiling a list of websites that provide copyright free images to assist students going forward and included them in the project guide in the final curriculum. It also made me appreciate the value of having your own photographs to use when designing an iBook. Students were not as self-aware of their lack of research skills and found it a challenge to identify reliable sources and remember to cite them. This influenced my decision to include a good research guide in my iBook.

This experience improved my understanding of the *Book Creator* App. One technical problem encountered was that we were not able to combine their individual chapters into one class book as planned. This was because different templates had

been used meaning some chapters were made in landscape mode and some were in portrait mode. It also became evident that the free version of the app was not enough for our needs. Finally, feedback from a colleague after her experience with second year students identified another area for improvement; the need for students to edit their work and submit more than one draft. “Students are always in a rush to hand their work in, if they are going to publish books they need to become editors as well as authors” (Laura, Feedback received at RE meeting 04/05/16). These lessons reinforced our commitment to continue using this app as we overcame the obstacles we faced and overall found the experience very worthwhile.

The innovation, creativity and enthusiasm demonstrated by the students surpassed my expectations. Students were engaged and motivated by the task of creating their own iBook as evident by the effort that they put into book layout, colour schemes, font style and overall presentation of the work. The level of research and detailed content included is also evidence of their engagement. Students particularly enjoyed being able to add audio and video to their iBooks. They inserted web links to *YouTube* videos to accompany what they wrote as well as filming their own videos. Students recorded definitions of key words and one group even wrote and recorded an original song for their iBook. Another group decided to include some Muslim prayers in Arabic. I was impressed to see how the technology was inspiring an original and in-depth approach to the content. While I had planned to complete the full project in a week, the student enthusiasm for content creation inspired me to arrange a class interview with a senior student in the school who had been on the Hajj with her family. Students used their iPads to record the interview and then edited it in *iMovie*. They were then able to include it in their iBook. Figure 4.18 is a screenshot from a page the student created iBook showing the video as well as audio features being used.

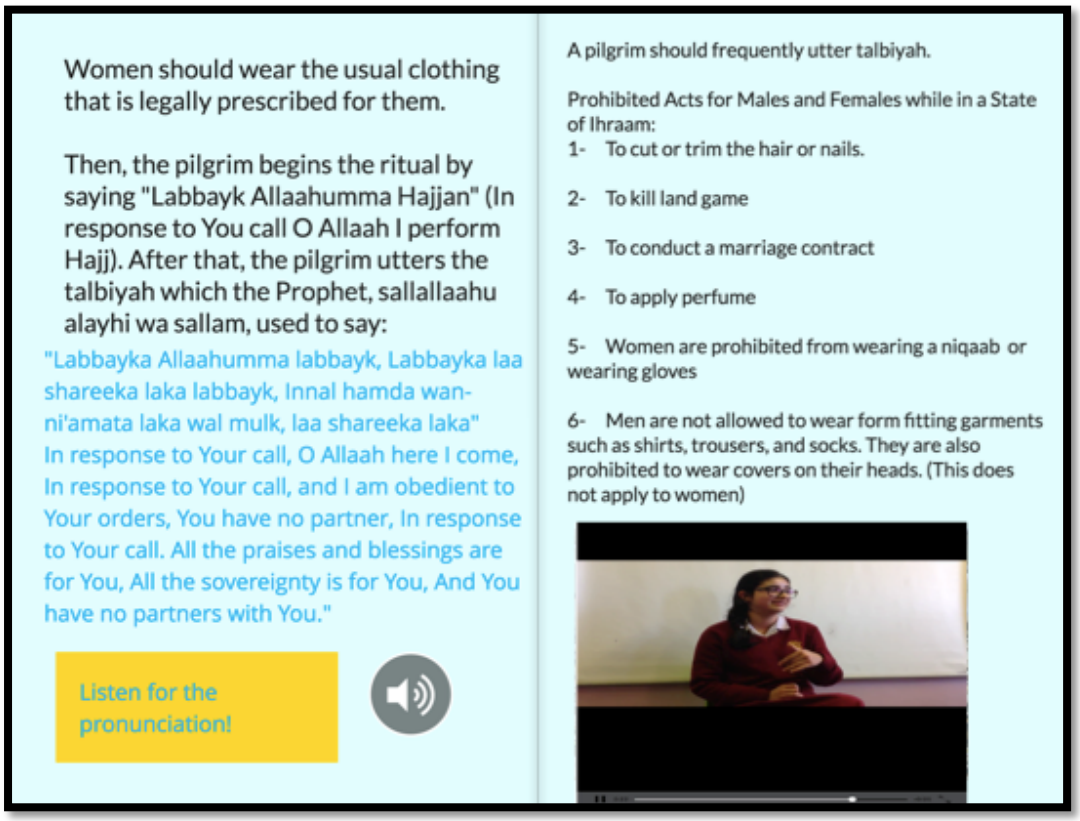


Figure 4.18: Sample page from student created iBook showing the use of audio and video to enhance the text

Feedback from students and colleagues about the *Book Creator* app mirrored my own first impressions as it was seen as "very easy to use, easier than doing a PowerPoint presentation but much more fun" (Student AM19). My colleagues felt the same noting "It was extremely user-friendly and with its blank canvas it provided the perfect platform for allowing the students imagination complete freedom to create a wide range of unique iBooks" (Laura, Feedback received at RE meeting 04/0516).

4.3.5 Do I understand what I have to now?

Moving through the second stage of the EEA helped me to understand in a deeper way my own talents and skills and how they could be used to bring about the changes that I wanted to see in my work. The guiding principles that facilitated a deep reflection on my passions, talents and skills had brought me back to my love of curriculum planning, writing and publishing. It helped expand my vision for my

curriculum. Seeing the student created multimodal iBooks inspired me to create my own iBook artefact in which to present the *Wonderlands* curriculum.

4.4 Create

Figure 4.19: An overview of the research during the create stage

4.4.1 The vision for Wonderlands

With valuable insights from the 'explore' and 'understand' stages and informed by the literature my research had progressed and I was ready to move into the create phase of the EEA. According to Crotty (2016) it was time for me to engage my

imagination and creativity and to establish a vision for my curriculum. The vision for *Wonderlands* was to create an innovative curriculum about pilgrimage and sacred places that have significance for my school community. Having explored and understood my values, work context and the literature I was committed to developing an integrated curriculum using the TPACK framework (Koehler and Mishra 2012). My main goals for the *Wonderlands* curriculum were to facilitate student collaboration, foster student creativity and enable my students to become creators of content rather than consumers (Johnson et al. 2015). I will now describe the content, technological and pedagogical aspects of my vision for an integrated curriculum.

4.4.1.1 Content: places of significance

Selecting places of significance as the content focus for my curriculum reflects my desire to help students explore places that are steeped in religious tradition and have appealed to spiritual seekers throughout the years. Pilgrimage is a significant spiritual experience that can appeal to young people in their search for meaning. Another important aspect of the vision for my design was to create a personalised curriculum that students could recognise themselves in. To achieve this, the curriculum would focus on places that had a special significance for my school community. With annual involvement in the Dublin Diocesan Pilgrimage to Lourdes, sixth year retreats being held in Lough Derg and third year retreats in Glendalough these became the starting point for my content choices. With a passion for travel and a collection of photographs from places I had visited I was excited to develop a new approach to this topic. This is a topic that is normally covered in third year but also allows a thematic approach as it links to key concepts found throughout the syllabus.

Having examined Bloom's flipped taxonomy (Wright 2012) that started with creating, I was initially envisioning students doing research and creating a project without developing background lessons. However, as much as I value creating I do not agree with Stinson (2015) who sees it as being more important than knowledge. Rather, I see both as equally important and feel they need to co-exist to enhance each other. From piloting the project and feedback from colleagues and students it was

decided that background knowledge was necessary. The following extract from my journal captures my reflections that prompted me to develop lessons:

> The importance of not assuming anything is the biggest lesson for me. The fact that the majority of the class had never heard of Knock shocked me. Most had heard of Lourdes, perhaps because 6th year students' travel there every year, but some had no idea where it was and only a few knew it was associated with Mary. The fact that Mary was supposed to have appeared came as a shock to many. Some were quick to dismiss the notion but were still baffled that there were so many alleged apparitions in so many places. They had a real curiosity to find out more about them. Their genuine disbelief that Mary was said to have appeared anywhere was almost funny. I assumed they would know some of this from primary school or maybe through family. Regardless of religious belief I thought Knock was a well known place. I'm aware that teaching in a city centre school our students come from a wide variety of primary schools. Their level of religious literacy varies greatly, often depending on whether they attended a Catholic primary school and some who attended Gaelscoils don't always have the language associated with very specific religious terms. When they researched Lough Derg online they struggled to understand what was meant by words like 'vigil' or 'penitential beds' so I have started to compile a glossary that can accompany the topic *(Journal entry extract, 20/01/16).*

The lack of prior knowledge was an impediment to students successfully creating an iBook on a place of religious significance. This phase of research was to expand the curriculum. Following Hofer and Harris' (2015) five-step planning guide for implementing TPACK, as outlined in chapter two, the first step was to choose the learning goals. In collaboration with my colleagues in the RE department we identified the following learning outcomes for the curriculum:

- Define 'Awe & Wonder'
- Identify places that are considered to be of special significance and explain why they are significant
- Compare and contrast different places of religious significance
- List a variety of reasons that people might go on pilgrimage or visit places of religious significance
- Reflect on the importance of pilgrimage for Christians
- Describe the central role of the Hajj for Muslims
- Explain how a place of religious significance can give people a sense of awe and wonder and strengthen their faith.

- Collaborate to create original content that can be used for peer teaching which will include text, audio, video and still images.
- Develop literacy skills with a key focus on digital literacy.

RE Department Meeting Minutes (09/11/16)

These outcomes focus primarily on the content but do reflect general pedagogical and technological outcomes. They were not based on any specific technology tools however as we remained open to using whatever best suited the outcomes. The final outcome was included to reflect our school context as our SIP focused on developing literacy.

4.4.1.2 Technology: choosing a multimedia platform

During the third stage of the EEA a decision regarding what type of platform or multimedia was most suited to the curriculum had to be made. Crotty encourages the researcher to adopt a multimodal approach, combining a variety of elements such as text, audio, images and video (Crotty 2014). The decision to have students create iBooks to present their work influenced the decision to also present my curriculum in an iBook format. As mentioned in the literature review, the iPad was not designed specifically for education, and it is important to note it was not designed to be an eReader. However, as the research has shown, this is the main use of the iPad in education, at least among early adopters (Hallissy et al. 2013). Educational publishers have made eBook versions of their textbooks available, and while they are often nothing more than glorified PDFs, they do allow schools replace textbooks with iPads. The research has also shown that teachers are creating their own content (Clarke and Svanaes 2012). This is not exactly new, as teachers have regularly made their own notes and PowerPoints to supplement the textbook. What is new is that, in spite of eBooks being available and being used, there is also evidence of a growing trend of teachers writing their own eBooks. Crotty (2016) advises the researcher to use their talents and skills when planning to create their curriculum and creating iBooks allowed me to draw on my publishing experience. It is equally important when following the EEA to be willing to take risks (Crotty 2014). Creating an iBook was a risk as it was something I had never tried before. I pushed myself further out

of my comfort zone with the decision to move beyond the simple *Book Creator* app and instead opted to use:

- iBooks Author – my choice for a teacher created iBook

This was supported by the use of:

- Bookry – to create widgets to enhance the iBook
- iTunesU – to share the iBook with students

The rationale for using iBooks Author as the main platform for my artefact was the fact it has more advanced functionality than *Book Creator*. It allows users to create fully interactive iBooks with embeddable content making it an ideal platform to bring together an integrated curriculum. I was conscious that using *iBooks Author* limited my curriculum to function on *Apple* devices but justified the choice as I was designing a curriculum especially for my school context. Mastering *iBooks Author* to make my own interactive multimedia artefact was more difficult than I had anticipated. While I largely relied on Apple's iBooks Author user manual and a variety of *YouTube* videos to guide me I found the format frustrating compared to how easy and intuitive *Book Creator* was. This self-taught technology was worth the effort but it also showed me my own limitations. The following journal extract captured my thoughts on my design dilemmas;

> The iBooks Author interface is not as intuitive as I thought it would be. I have struggled with the layout in the fixed template. I'm feeling my own artistic inadequacies as I try to make the pages look nice with font and colour choices. I never had to worry about these things when I worked in publishing as there were professionals there to design and typeset the text, as well as editors and even people to arrange copyright for everything I wanted to use. Even though it is hard I'm enjoying the challenge (*Journal entry extract, 10/08/16).*

The main advantage of using *iBooks Author* was the ability to add widgets. A widget is an application, or a component of an interface, that enables a user to perform a function or access a service. I was first introduced to the idea at the Mobile Technology in Initial Teacher Education (MiTE) conference on 15 January 2016

where I had the opportunity to present my work. With a strong focus on iPads throughout the conference, the keynote speaker was Dr. Bill Rankin, the Director of Learning at Apple. As well as providing valuable feedback this conference fuelled my passion for technology in education with inspiring and thought-provoking presentations. As I shared my research I received feedback from fellow researchers as well as Apple Distinguished Educators who gave very specific advice on the use of iPads in education. This moved my artefact creation forward as noted in my journal:

> Discovering widgets and getting some basic instructions on how to use them has sparked my imagination and excitement for enhancing my iBook. I had toyed with the idea of just using the *Book Creator* app to create my own iBook for the students but now I feel I need to further develop my technical skills and learn how to use *iBooks Author*. Seeing how the widgets can help me add photograph galleries, link to *YouTube* videos and even incorporate social media links in a safe way really opens up many exciting opportunities *(Journal entry extract, 16/01/16)*.

I opted to use the Bookry website to get widgets specifically designed to work with teacher created iBooks using *iBooks Author*. They fall into three main categories: puzzles and games, web services and functional. Figure 4.20 shows an overview of the Bookry widgets that I created for *Wonderlands*.

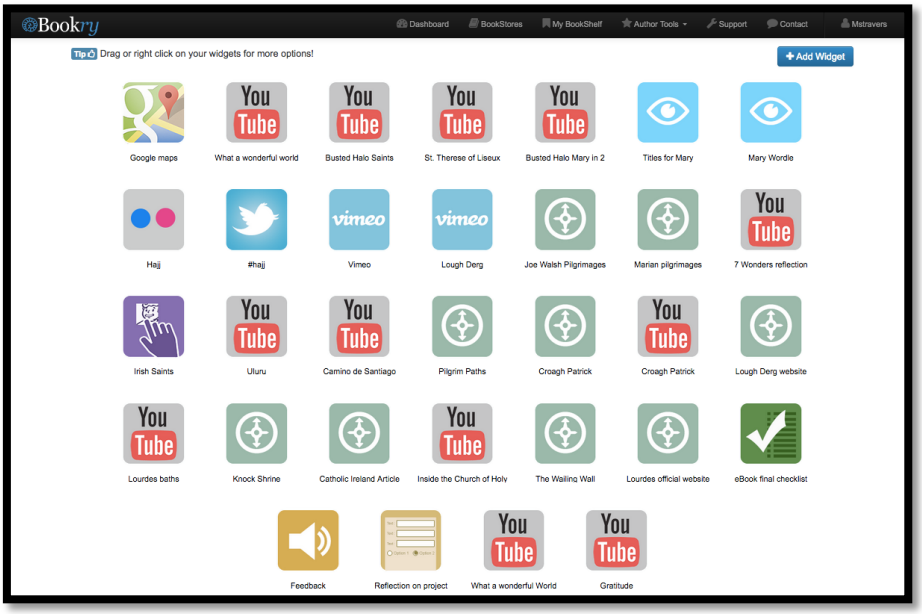


Figure 4.20: An overview of widgets in Wonderlands

These widgets allowed me to make the iBook more interactive, meaning when students complete the tasks on the widgets I can access their responses on the *Bookry* website. Being introduced to the world of widgets greatly enhanced the functionality of my artefact. Integrating this new 'technology knowledge' (Mishra and Koehler 2006) influenced the content and pedagogy. The web services widgets allowed me to choose content from online sources, including social media, to enhance the curriculum. The puzzles and games widgets supported my pedagogical approach to regular formative assessment for students. Thus, integration of the three was possible.

The unexpected disadvantage of iBooks Author was the difficulty in sharing the file with others. As the book grew it was too large to share via email or on any of the learning platforms I was familiar with. To reduce the size I removed some of the videos that were embedded in the text, only keeping the ones that were hosted on a widget. This still did not resolve the issue. I turned to one of my digital champions for advice.

> Having tried to upload the book to share with the students via *Edmodo* or *Showbie* as originally planned I was really disappointed that the file was too large too share. It was definitely too large to email so I was really concerned that nobody would be able to have access to it. I discussed my dilemma with Sean (one of my digital champions) and that he suggested sharing it via *iTunes U*. I was relieved that this solved the problem. However, it was not ideal having to introduce another learning platform, especially one that I had never used before. *(Journal entry extract, 26/08/16).*

In spite of the inconvenience in having to use *iTunesU* it did allow me to share the iBook with the students and once they downloaded it they could access it through their iBook app. Once they had access to it the interactive *Wonderlands* iBook worked seamlessly on the student iPads and I was satisfied in my choice of platform for the curriculum.

4.4.1.3 Pedagogy: a value based approach

Wonderlands is pedagogically grounded in my values of creativity and collaboration. It was also influenced by my 'Pedagogical Content Knowledge' (Mishra and Koehler 2006) and implements Groome's Christian Praxis or 'life to faith to life' approach to RE. For example, the first lesson introduces the generative theme of

significant places by looking at the Seven Wonders of the World and introduces the key concept of 'awe and wonder' starting with what the students know by asking them about places that give them a sense of 'awe and wonder' before moving on to look at religious places in the next section. Although there is no specific RE subject strand, the Hofer and Harris' (2015) Learning Activity Types (LATs) taxonomy for social studies was a useful starting point for designing my curriculum lessons. The emphasis was placed upon content-based learning activities rather than the affordances and constraints of educational technologies. The LATs offer organised collections of activities for teachers to consider. This helped me to consider the variety of activity types that could be part of the curriculum as well as offering suggestions for technology to match. This kept me focused on the importance of knowledge-building activities. The *Wonderlands* pedagogy focuses on active learning methodologies and sets out to facilitate student collaboration with a variety of activities designed for pair and group work as well as whole class collaboration. Some of these activities use technology while others are offline activities as the curriculum strives to maintain a balanced approach to 'connectedness and disconnectedness' (Powers 2010).

With the end goal of having students publish their own iBooks we wanted to ascertain student knowledge, understanding, skills and attitudes throughout the curriculum to help them succeed in the final assessment task. In order to achieve this I drew on Williams (2013) key strategies for formative assessment. This included sharing the learning intentions and success criteria for each section of the curriculum with the students. Implementing my 'Technological Content Knowledge' (Mishra and Koehler 2006) each chapter ends with a 'digital disciple' activity that encourages the students to get creative with a variety of technology tools while demonstrating their subject knowledge. I had developed skills and confidence using a variety of apps throughout the initial action research cycles and I was able to see how they could be used to enhance the pedagogical approach in the curriculum. Figure 4.21 is an overview of the vision for the final project with five key steps, 1) preparation, 2) research, 3) writing, 4) content creation and design and 5) publish.

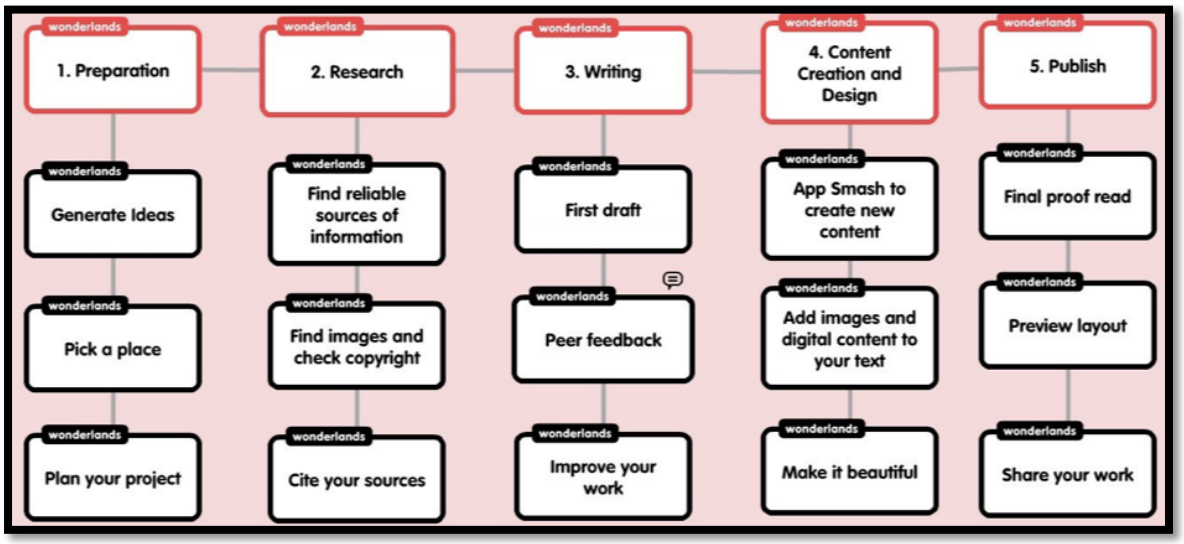


Figure 4.21: An overview of the final Wonderlands project

Designing a suitable rubric to plan the assessment of all the elements of the project was challenging and initial drafts were deemed too complex (See appendix M for the first draft). However, it was important to incorporate all the key elements of the inquiry based research project in the assessment. With the key values of creativity and collaboration underpinning the curriculum it was felt that it was important to explicitly include them in the marking scheme. Figure 4.22 shows the final rubrics we settled on for the project.

Key Elements	Guiding Principles..	Marks Allocated
Research skills	• Were three sources of information used? • Were the sources reliable and cited correctly?	20
Writing and content	• Was the work well written with good spelling and grammar? • Was original content written? • Were the focus questions answered?	30
Digital skills	• Were at least three pieces of original content created with other apps/websites? • Does any audio, video or web links work?	20
Design	• Is the eBook laid out and presented clearly?	10
Collaboration	• Did the group work well together?	10
Creativity	• Did the group use their talents and skills to create something original?	10

Figure 4.22: The marking scheme for the final Wonderlands project

Williams (2013) identified students as learning resources for one another and students owning their own learning as two other key characteristics for formative assessment. An emphasis was placed on peer assessment, with students encouraged to proof read each other's work and offer feedback before submitting their final draft. The use of widgets helped to support the pedagogical approach. Using Bookry I created a checklist to assist students in completing their iBook as seen in figure 4.23.

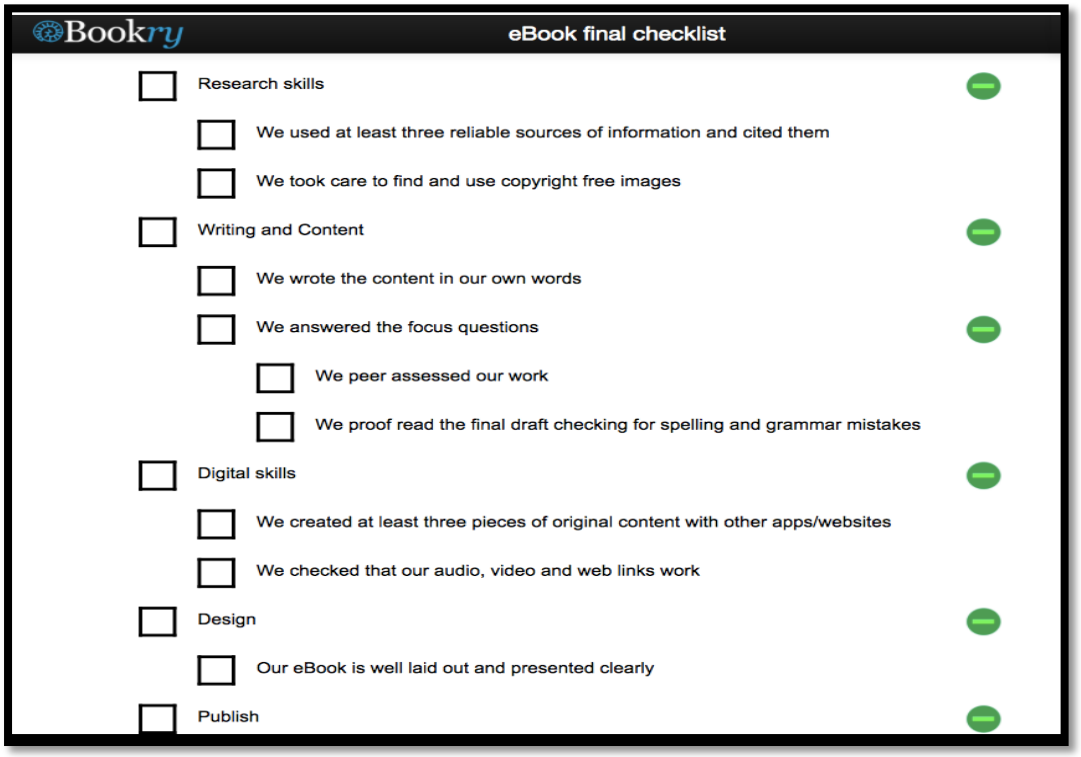


Figure 4.23: The student checklist for their iBook

The collaborative aspect proved to be the most challenging to assess. There is always the risk with group work that some students end up doing more and others do less. To try and encourage everyone to fully engage with the project students were asked to submit an individual reflection on their project. See figure 4.24. Students have access to the rubrics and reflection forms from the start of the project as they are contained in the final chapter of the *Wonderlands* iBook, which allows them to plan and prepare their project with all the key elements in mind.

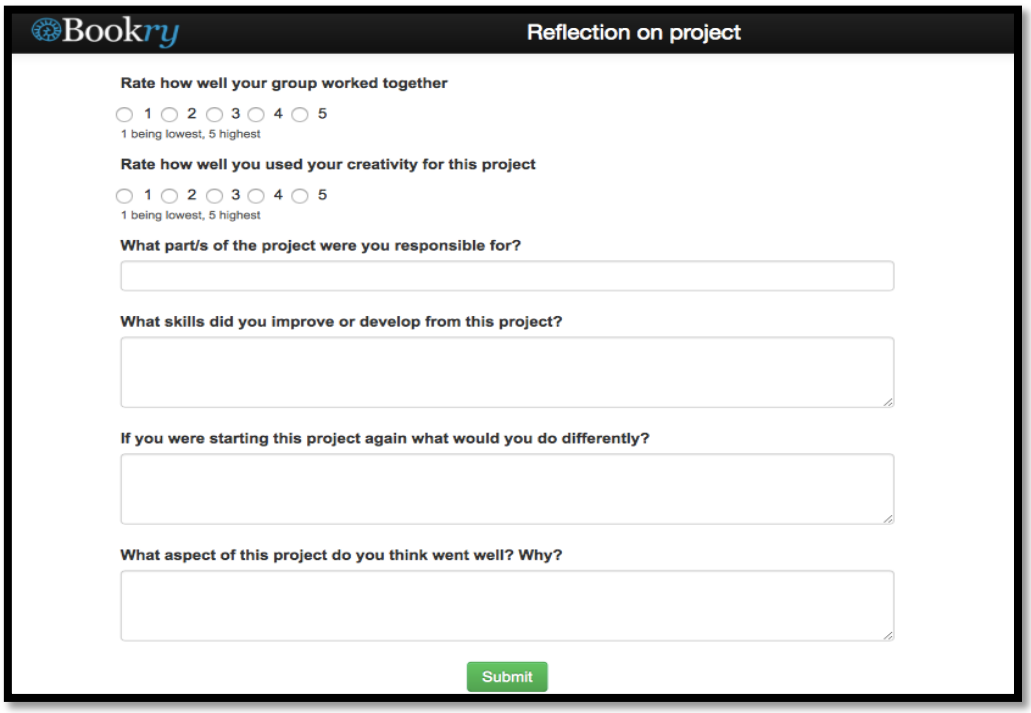


Figure 4.24: Template for student reflection on their project

4.4.2 A collaborative creation

In the pursuit of developing a quality curriculum and artefact I was motivated to constantly look for ways to improve my work. As the work progressed the greatest improvements came about from the input of my colleagues, my students, my peers and my supervisors. Feedback came in different forms, from RE department meetings with colleagues, social validation meetings with peers and supervisors and through the questionnaires I gave to students. Feedback also came through informal conversations, emails and even text messages. My colleagues, my peers and my students provided differing but important perspectives on my work. Some had no digital expertise or no interest in technology but their passion for religious education helped me keep a clear focus on my content and pedagogy while others were my 'digital champions' offering solutions to technical problems.

I was fortunate to be able to call upon the advice and critical feedback of some very experienced and honest peers. Eight of us began the EdD journey together, all carrying out research in the area of RE. From the start of the EdD programme we were encouraged to share our research proposal and progress with each other. The fact that we were on the same journey helped to create a safe space to share our work

in order to strengthen and refine it. The advice and appraisal I received at these meetings became an essential part of following the EEA as they allowed me to subject my work to a rigorous process of validation (Crotty 2014).

Figure 4.25: My EdD peers

At the outset these validation meetings helped me decide on the direction of my research, refine my research question and embrace carrying out action research in my workplace. These meetings provided a space to share my ideas and concerns. More than being a place to bring my dilemmas when I came to a crossroads in my work, they highlighted issues and brought ideas that I had not seen for myself. By examining the work of my peers and in listening to others reactions to my work I exposed myself to completely different interpretations and thought processes.

> I have been urged to reconsider a few of my ideas, as it is clear I am trying to do too much. There is so much that is possible with technology in RE but what is going to be my focus? I have jumped from ePortfolios to social media to iPads. It has been confirmed that we will begin our 1:1 iPad programme in September and I did enjoy using the class set this year. The general feeling among the group is that the timing is perfect for me to tap into the potential of iPads in RE *(Journal entry extract, 10/05/14).*

As my research question evolved and I chose my methodology, I was in the fortunate position to have two supervisors Dr. Gareth Byrne and Dr. Yvonne Crotty. While Dr. Byrne lead the meetings with my EdD peers, Dr. Crotty invited me to participate in validation meetings she was holding with Dr. Margaret Farren and a group of PhD

students. It was particularly helpful to meet with other action researchers, specifically those familiar with the EEA. Presenting my research at these meetings proved fruitful and enabled me to further develop my ideas.

> The validation meeting provided some useful insights. My working title – From Textbooks to iPads – indicated that I wanted to move away from books completely but the more I spoke about the idea of creating iBooks the more excited I got. Now I have decided to go full circle, from textbooks to iPads to iBooks. As Steve Jobs once said it is easy to connect the dots looking back. As I reflect on my values, passions and experience in publishing I can't believe it took me so long to figure out that this is the direction I want to go *(Journal entry extract, 01/04/16).*

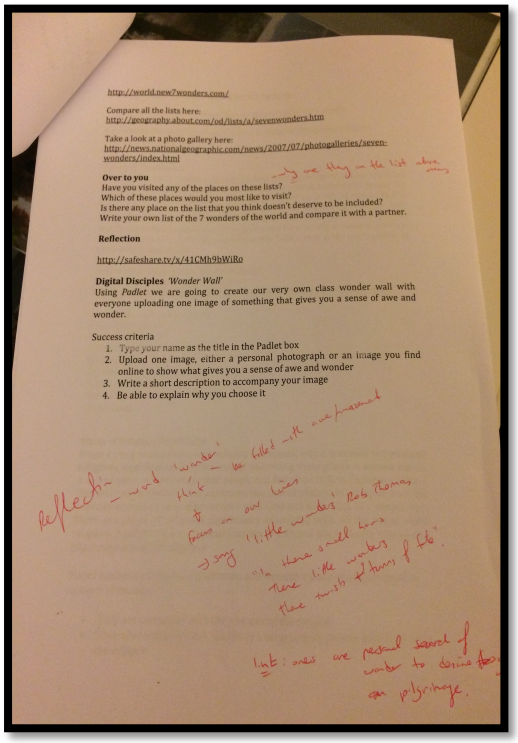
The feedback throughout each stage of action research enabled me to strengthen my curriculum and develop lessons and an assessment task that integrated content, pedagogy and technology. The final challenge was to bring this work together to present the final completed curriculum in an iBook. With a draft of the iBook written I sought and obtained constructive feedback on the newly created content that helped me to refine my work.

4.4.2.1 Co-creating content

The EEA encourages the researcher to collaborate and co-create knowledge throughout the create stage (Crotty 2016, 2014). At one validation meeting I shared my draft curriculum content. A peer questioned me about the fact Pope Francis was not mentioned in the curriculum. She noted, perhaps jokingly, that if the content was based on my values and passions he should be included, as I often expressed such admiration for him. My supervisor, Dr. Byrne suggested adding a quote from *Laudato Si* informing me that Pope Francis spoke about sacred places in it. The opening quote inside the *Wonderlands* iBook now comes from this encyclical. Reflecting on this feedback also inspired me to include a lesson on World Youth Day with a link to Pope Francis' message to young people. Adding this lesson helped me to expand the curriculum from just examining places of religious significance to the act of pilgrimage as a journey, further enhancing the curriculum.

I had the benefit of ongoing collaboration and co-creation with my colleagues in the RE department as indicated throughout this chapter. Their input was instrumental in

shaping the curriculum from ideas to fruition. As I developed the curriculum the feedback I received from my colleagues was essential to ensure that it brought together our collective ideas to create a personalised curriculum for our workplace. At RE department meetings we sat together and decided on the learning outcomes for the curriculum, discussed the pedagogy, agreed on the assessment tasks and marking scheme for the student project and shared technology tips. As I wrote content my colleagues provided valuable constructive feedback. Figure 4.26 is evidence of hand written feedback I received from a colleague on an early draft of the curriculum. Figure 4.27 is evidence of the willingness of my colleagues to share their personal perspectives as well as their photographs to enhance the curriculum.



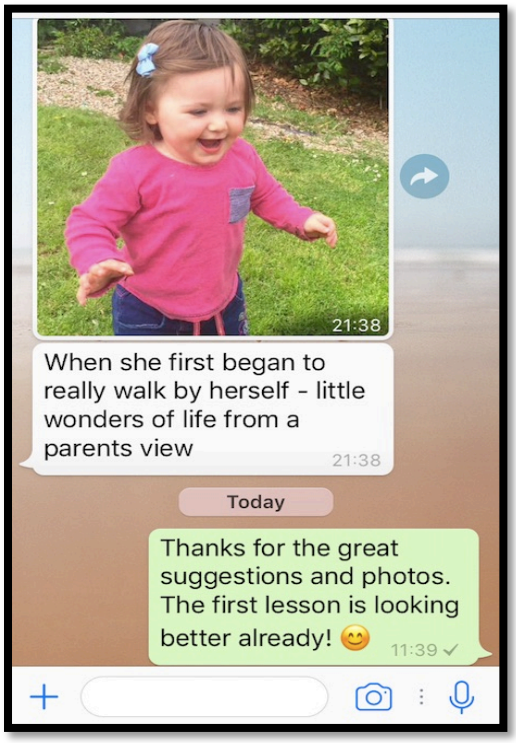


Figure 4.26: Written feedback *Figure 4.27: A colleague's perspective*

Welcoming this constructive feedback I could see how it moved me beyond my own limitations. I reflected on this in my journal:

> Laura felt that the chapter on Awe and Wonder was too focused on places and nature and said that for her becoming a parent is what comes to mind. I realised that the content only reflected my own perspective and luckily Laura was happy to share beautiful photographs of her daughter to illustrate the point. *(Journal entry extract, 02/04/16).*

The importance of being open to co-creation had to be balanced with my role as researcher. Therefore it was up to me to decide what ideas were worth incorporating and what ones were not. The following extract from my journal shows evidence of feedback I received that I acknowledged but did not fully agree with:

> Aoife would like to see a section on Taizé and Laura suggested more places of pilgrimage in other world religions, not just Islam. I understand that Taizé provides a unique ecumenical dimension but I have to draw the line about what places to include lessons on. Islam is included because students already study this religion in second year. The lesson on Jerusalem looks at it as a sacred city for Jews, Christians and Muslims. I don't want to write background lessons on religions they have not studied yet. Students can still pick any place, from any world religion for their research component. I can add relevant web links to help facilitate this but I don't think it is realistic to try and cover any more places in detail *(Journal entry extract, 20/03/16)*.

Some of my final feedback from my colleagues came as used the iBook artefact with their class. The feedback questions that I had prepared as starting point for discussion was shared with colleagues to prompt formative feedback. (See appendix H). My colleagues also noted minor spelling and grammatical errors as well as some technical issues.

Feedback	**Action**
The link on page 14 doesn't work	Replaced with another link
On the quiz on page 19 option three has two answers together	This was a typo and was removed
When I clicked on the picture on page 22 nothing happens	This was an error as originally I made it a link but that link was moved
The instructions for the digital disciple activity at the end of chapter 3 were not clear to the students	Edited the text and elaborated on the task
The slideshow on Jerusalem doesn't work	It works once you click inside the box first so no action was needed

Table 4.3: Colleague feedback and resulting action to improve artefact

The feedback I received continued to shape the content. Figure 4.28 is an example of specific ideas for content that came from my colleague Laura after her first time

using the lesson on ‘awe and wonder’. This feedback was incorporated into the second iteration of the iBook artefact.

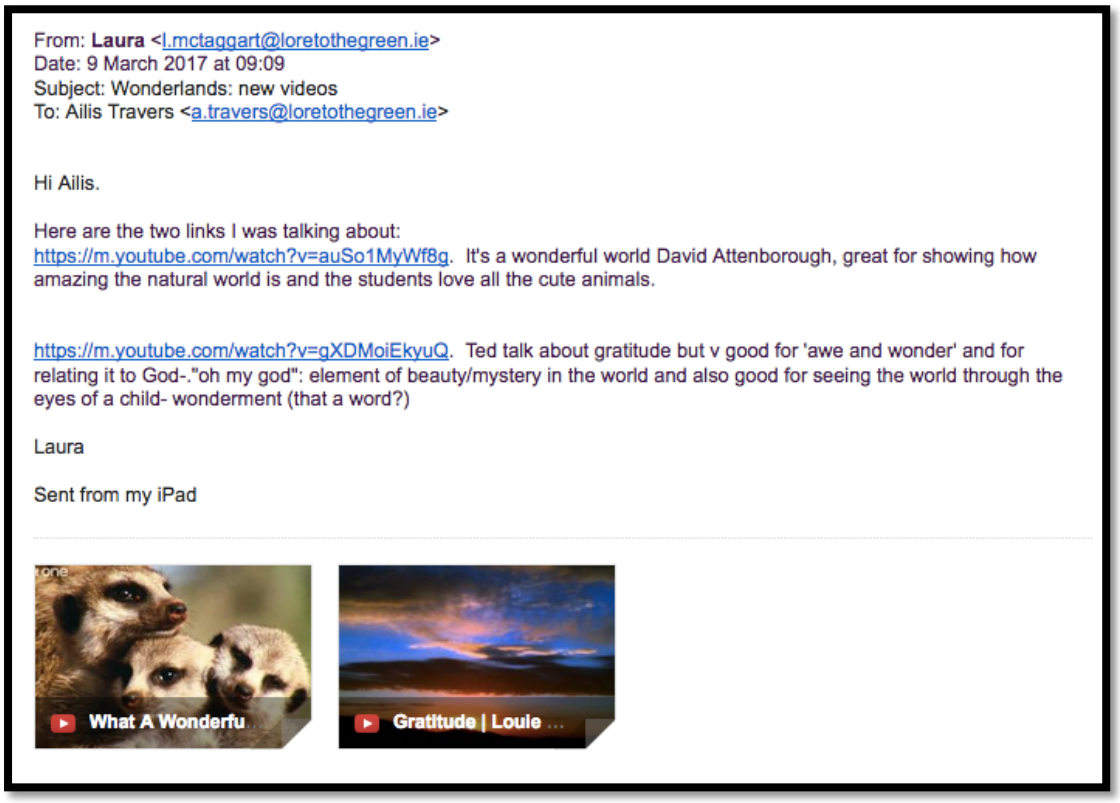


Figure 4.28: Colleague content contribution

The issue of copyright for images was as difficult for me as it had been for the student created iBooks. As a starting point my passion for travelling and photography meant I had plenty of my own photographs to use. The mobility of the iPads, as highlighted in the literature (Melhuish and Falloon 2010), made them ideal for accompanying us on the trips to Lourdes, Glendalough and Lough Derg so I was able to take photographs specifically for *Wonderlands*. I didn't want to limit myself to my own photographs, and this wasn’t possible when adding in lessons on places that I have never been to. Advice for websites that provide copyright free images came from my digital champions. The emphasis on collaboration in the EEA helped to overcome these limitations and improve the design of my iBook. Dr. Crotty invited me to meet Sr. Tess Ward, an avid iBooks Author who has developed bilingual literacy programmes for remote indigenous communities in Australia. After sharing my struggle for images of the Holy Land she emailed me a folder of her

photographs with permission to use them for my iBook and also for my students to use as seen in figure 4.29.

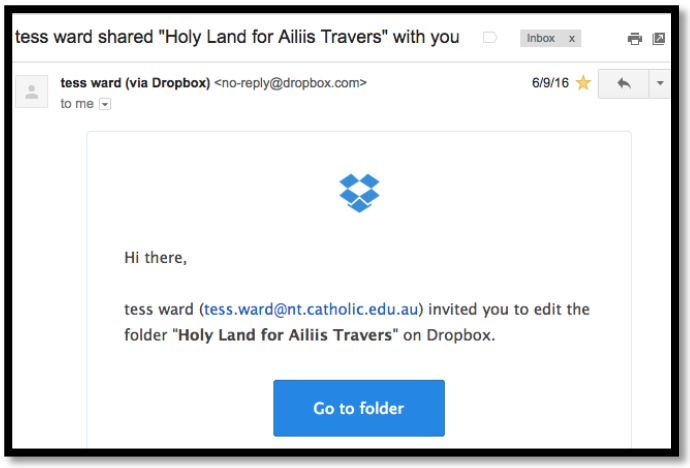


Figure 4.29 Collaborating to overcome copyright issues for images

The collaboration further extended to my colleagues and students who kindly shared their photographs. See figure 4.30 for an example of photographs students shared from their pilgrimage to World Youth Day.

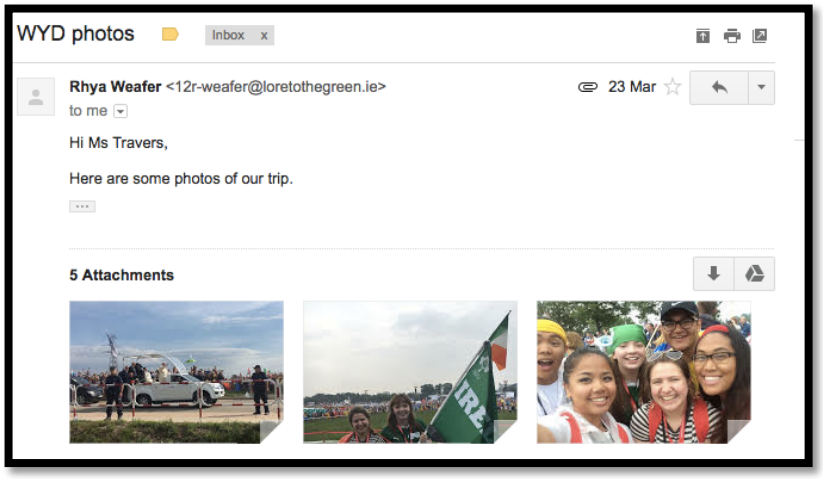


Figure 4.30: Student content co-creation

The collaborative nature of the iBook design further brought to life my vision of creating a curriculum with and for my school community. The advanced levels of collaboration and co-creation that the EEA facilitates ensured that my colleagues and students felt a sense of ownership of the *Wonderlands* curriculum.

4.4.2.2 The students have the final say

The *Wonderlands* curriculum was developed for my students so having the opportunity to use the finished iBook with them and receive their feedback was an important final aspect of this research. The questionnaire I gave to the students (see appendix G) produced very encouraging feedback on what I was doing and gave me confidence that I was achieving my original aims and objectives. When asked specifically how the *Wonderlands* iBook compared to other iBooks that they had used, their positive responses highlighted the popularity of the interactive features. They described it as "more interactive and personal" (CM9) and "more interactive and better suited to an iPad" (CM10). Some had mixed feelings noting, "I like the activities and interactive videos but I think I prefer the layout of textbooks better" (CM17). While another felt it was "easier to use and more colourful" (CM14). The photos and videos proved to be the most popular feature, "I prefer it as it is interesting to be able to watch videos, slideshows and see picture galleries" (CM12). The personalised aspect of the iBook was also emphasised, "It's more interactive and has videos and photos galleries available with photos taken by people in our school" (CM1). I was particularly surprised to note feedback regarding how well it operated for the students with one commenting that it "works very well, has no glitches that the textbooks have" (CM3) and another simply saying it has "much more functions, crashes much less" (CM22). After my careful deliberations when choosing my technology platform I was relieved that choosing *iBooks Author* because it was specifically designed for iPads seemed to pay off.

Students were asked for specific feedback on what they liked about *Wonderlands* in the feedback questionnaire. There were some very positive responses describing a wide variety of things that students liked about it. While many referred to the interactive features I was delighted to see that the learning outcomes being included in the text was also mentioned, "I liked the learning outcomes and the pictures and the websites to find the questions" (CM9). Many repeated previous feedback talking about the photos, videos and interactive features "I liked the picture albums and all the audio and video clips as they were very interesting" (CM2). Others picked specific features; "The Hajj live streaming was very interesting" (CM1). A number of students shared their appreciation of the web links, "I like the way there were links you could go straight to" and "the different links were very helpful because

they gave you loads of interesting information" (CM14). I was pleased to see some students referred to the quizzes noting, "it helped to learn about the topic and revise what you did learn also" (CM24).

The many positive comments on the iBook artefact gave me a sense of pride in my accomplishment and also let me know I was on the right path in terms of following my instincts of what could constitute an engaging approach to non-examination RE. The student reaction to the visual and audio elements reflected what the literature had indicated. In the second iteration of the artefact I drew on the positive feedback to reinforce what was working, adding additional images and video clips.

Students were asked to describe what they did not like about the iBook artefact. A few reoccurring issues emerged. Some of these issues were down to the students being unfamiliar with the iBook platform, which was considerably different to the *Edco* or *Folens* apps that they were used to using. Students felt "it was a bit hard to find chapters" (CM19) and said they were "confused about how to get to different chapters and pages" (CM3). One observed that "some of the pages were hard to find as there were different pages in other pages" (CM8), highlighting the difference between an interactive, multimodal text and the normal texts they were used to. While some students had stated that they liked the layout, many felt that this could be improved commenting "There was a lot of writing all in one go" (CM16); "I did not like the way there was a lot of information in small sections" (CM2) and "the questions didn't look very clear on the page" (CM7). As I reviewed the layout in light of these comments it was evident that some pages needed improvement. One particular point that students quickly discovered was that "you couldn't zoom in on the text" (CM24) which I had to keep in mind when placing text on the pages. They also found that it "took up a lot of storage and was slow to open for me" (CM1). This was not surprising as the finished iBook was a large file and student iPad storage is very limited. Table 4.4 summarises the main categories of constructive feedback of the iBook artefact and the action taken to address these issues where possible.

Feedback	Action
Too much writing on some pages	Edited writing to reduce content where feasible and improved layout of text to take this into consideration.
Can't zoom in or add notes	Cannot do anything about this but hopefully change in text layout as noted above will help.
Trouble opening the book/ storage issues	Storage issues with iPads were a recurring issue that I could do very little about. I did try to ensure that videos were not built into the text directly, using web links or widgets to try and save space. Students were also advised to delete unnecessary data.
Questions not clear	Added headings in bold and numbered questions.
Hard to find chapters and pages	A lot of the layout was based on the iBooks Author template. I added extra instructions e.g. click here for more, scroll down etc. Going forward it is also worth showing students an overview of chapters and how to navigate before we begin.

Table 4.4: Student feedback and resulting action to improve artefact

The importance of collaboration and co-creation in the EEA was evident from the valuable constructive feedback that I received throughout the research but most notably during the Create stage. The differing perspectives, preferences and expertise of all the feedback participants when brought together helped to create a well-rounded curriculum and artefact that exceeded my own ability. The formative feedback influenced the content choices, shaped the pedagogical approaches and helped to tweak the technology glitches. The time and attention that peers, colleagues and students took to carefully appraise and critique the work surpassed my expectations. It showed they were engaged with the curriculum, which kept me motivated to successfully finish and implement it. Upon completion of the curriculum I was delighted to receive this final feedback from my colleagues at our RE Department meeting on 29th May 2017.

- The iBook looks very professional; it is hard to believe you made it! It is a well-written and pedagogically grounded curriculum.
- It makes my life easier because it has all the content, links and videos in the same place. The students seem to love it as much as I do so even if I am biased that is the real sign of success. They love the interactive links.
- The students are completely engaged in the lessons. Little things like the way there are boxes they can scroll through seems to fascinate them.
- The amount of planning and creative hard work you have done has paid off.

4.5 Chapter summary

This chapter illustrates the ingenuity and originality in my work by providing evidence of the creative process I undertook on 'the way to Wonderlands'. Following my educational values and the EEA I outlined how I was open to collaboration and co-creating knowledge with others throughout this process (Crotty 2014). Central to this was the exploration of how I shaped and was shaped by the new eCulture in my workplace. I demonstrated how rediscovering my talents and skills helped me understand what I could do to improve my workplace practice. Evidence was shared to show how I made use of all the communication channels available to me in order to receive formative feedback, validate my work and produce quality research (Crotty 2016, 2014). From my vision for the *Wonderlands* curriculum through to seeing it being implemented in my workplace I was inspired by the quote at the start of this chapter,

> What is the use of a book, thought Alice, without pictures or conversations?
>
> Lewis Carroll, Alice in Wonderland

The *Wonderlands* iBook is filled with pictures and conversations bringing content to life in a new and personalised way for my workplace context. It has transformed our approach to non-examination RE. I have achieved my aim of creating an innovative curriculum for religious education that integrates technology, pedagogy and content. The transformation that has resulted from this research goes beyond the completed curriculum and iBook artefact. In the next chapter I will reflect on how this work has been transformative for me on a personal and professional level as well as the wider impact of this research.

CHAPTER FIVE
WELCOME TO WONDERLANDS

I can't go back to yesterday because I was a different person then.
Lewis Carroll, Alice in Wonderland

5.1 Introduction

The final phase of the Educational Entrepreneurial Approach (EEA) to action research requires the researcher to 'show transformation'. In this chapter I will turn my attention to the EEA's final question; *"what has been the impact of this research?"* (Crotty 2014). I will reflect on the impact of this research on me, professionally and personally, as well as within my school context, starting with our newly transformed RE curriculum. The *Wonderlands* curriculum successfully integrates technology, pedagogy and content. The evidence for this is found in the *Wonderlands* iBook, an original artefact that did not exist before this process began. Access to the finished iBook is available by clicking on figure 5.1, scanning the QR code below, or via https://itunesu.itunes.apple.com/enroll/ENF-XDF-CRC [Please note: To access it you must use an iOS device with the *iTunes U* app installed].

Figure 5.1: Opening page of Wonderlands iBook

Created from a research process driven by my values and those of my workplace I will now illustrate how the *Wonderlands* curriculum has transformed the approach we take to non-examination RE.

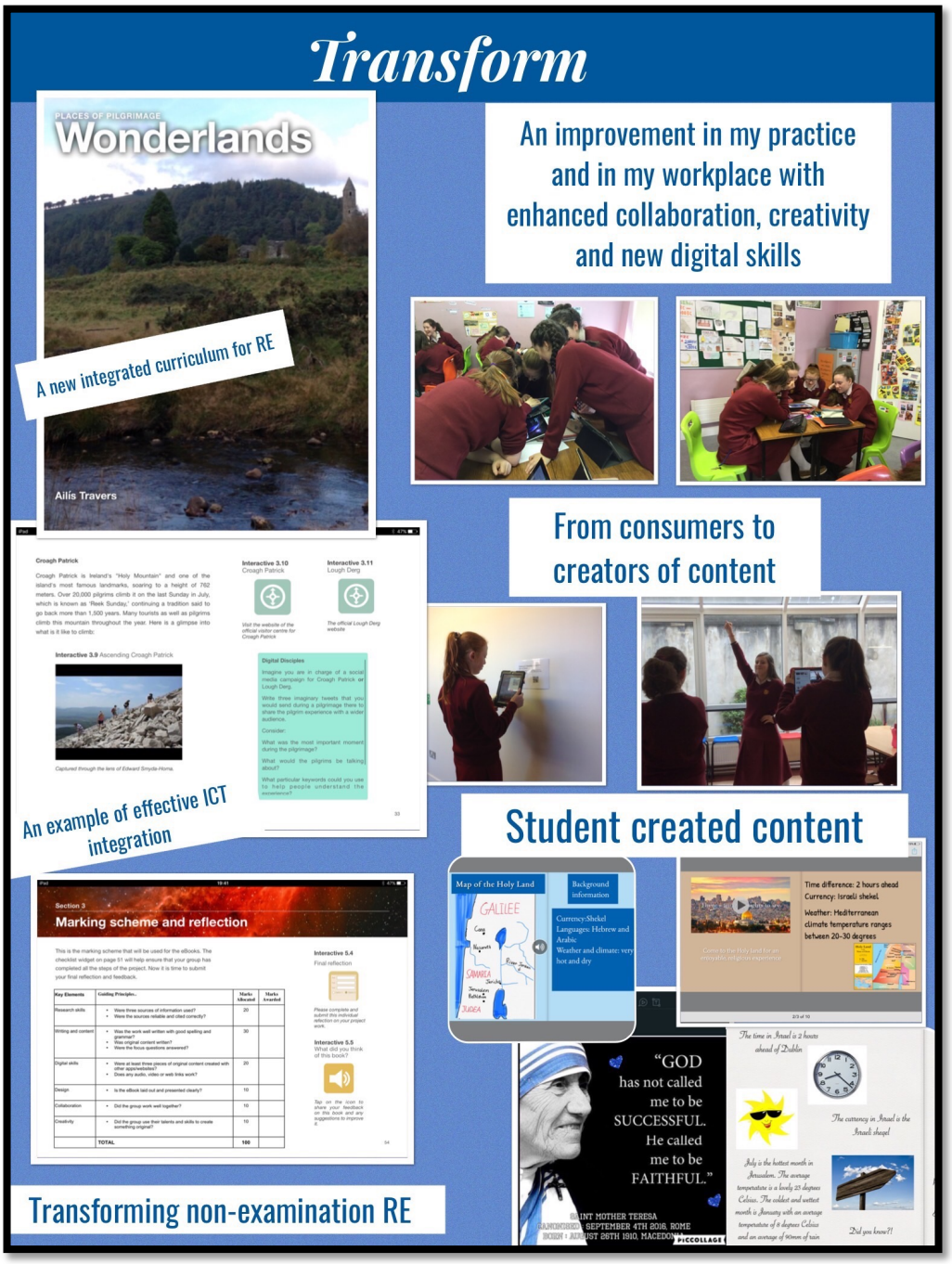


Figure 5.2: An overview of the research during the Transformation stage

5.2 An innovative curriculum

The *Wonderlands* curriculum was analysed and evaluated with a review of how its creation was shaped by the literature and the implementation of the EEA as well as reflecting upon the experience of piloting it and feedback received. From this three main areas of curriculum transformation were identified:

- Spiral and cross-curricular approach
- Personalised content
- Real world relevance

I will now explore each of these in turn.

5.2.1. Spiral and cross-curricular approach

The Junior Certificate RE Teacher Guidelines (DES 2001) offer a wide variety of approaches to teaching the syllabus. Through this research I became aware of how much of our planned approach had been dominated by completing textbooks and preparing from the exam. In spite of the numerous approaches suggested we had always begun first year with the first chapter of the textbook and finished third year with the last chapter of the textbook. There was nothing intrinsically wrong with this but it left little opportunity for revisiting topics. Pilgrimage is a concept that has significant links throughout the syllabus. This allowed me to design Wonderlands as a spiral curriculum (Bruner 1996). The content explains the concept of pilgrimage and presents an overview of a variety of places of religious significance. Pilgrimage, is a key concept on the Junior Certificate Course that comes directly from Section E, The Celebration of Faith, Part 1: The World of Ritual (DES 2000). Wonderlands also links to:

- Section E Part 2: The experience of worship, Part 3 Worship as a response to mystery, Part 4: Sign and Symbol, Part 5: Prayer
- Section A Communities of Faith, Part 3 Communities of Faith and Part 4: Relationships Between Communities of Faith
- Section B Foundations of Religion – Christianity, Part 1: The Context
- Section C Foundations of Religion – Major World Religions. Part 1: The Context, Part 3: Rites of Passage and Other Rituals
- Section D Part 2: The Beginnings of Faith, Part 4: The Expression of Faith.

While the theme of pilgrimage connects all the lessons, each lesson can be used in a stand-alone manner or each chapter, which contains a number of lessons, can be covered as separate topic or the content can be taught as a full curriculum taking a

thematic approach to the syllabus. Inspired by Bruner's (1966) Spiral Curriculum where students build upon prior knowledge by revisiting a concept a number of times, each time probing deeper, the content in *Wonderlands* revisits concepts covered in first and second year. Lessons on Awe and Wonder, Mary and Saints provide further background information relevant to the topic. See figure 5.3 for an overview of the table of contents.

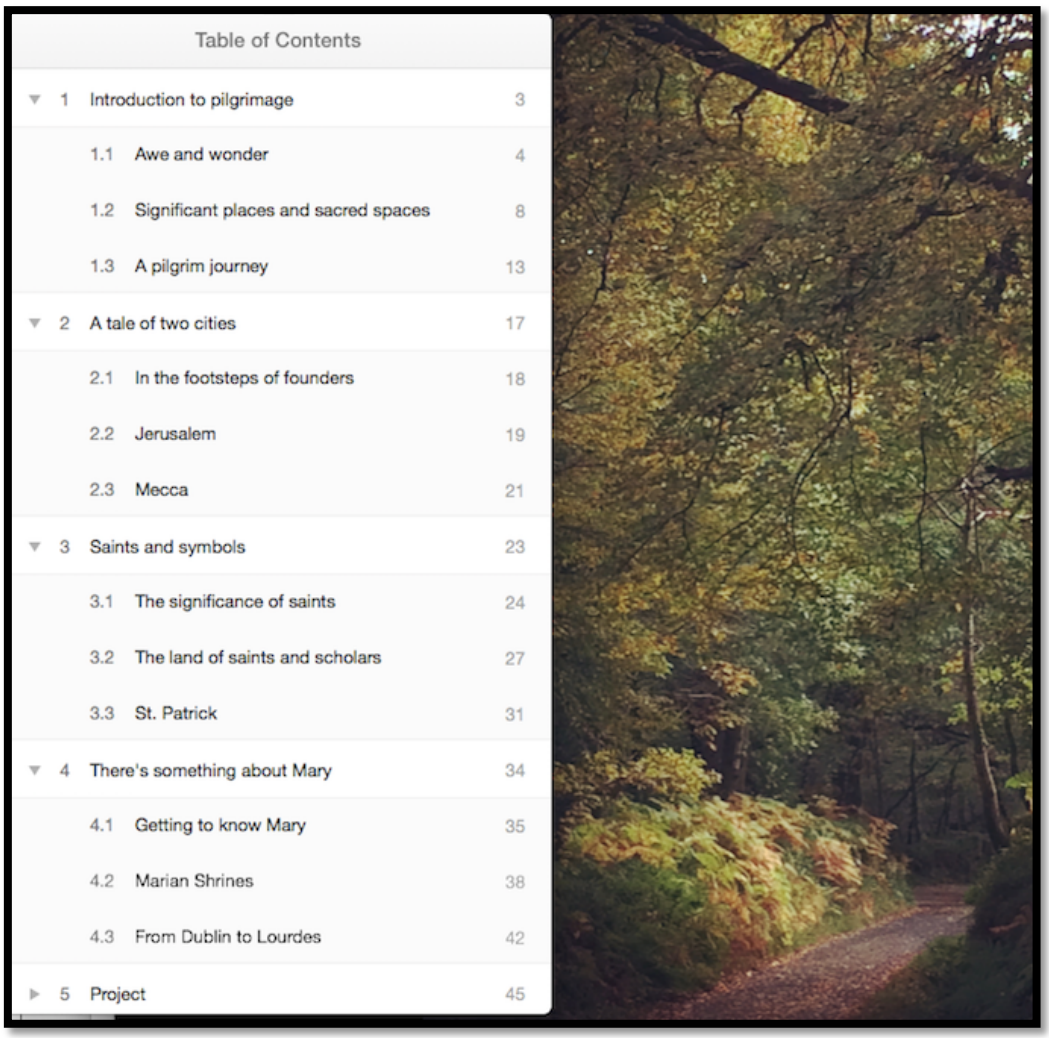


Figure 5.3: Wonderlands table of contents

As informed choices about the content were made throughout this research the scope of the content covered was transformed. Opting to limit the number of significant places being covered instead I chose to expand the content to include more depth. Adding these additional layers of content provided students with more background knowledge, for example lessons on Mary and Saints had not been covered directly

before. Another new dimension was the inclusion of cross-curricular links as seen in figure 5.4.

Figure 5.4: Cross-curricular links

This was useful within a constructivist pedagogical approach where student prior knowledge and perspectives are important starting points. Helping students to see links to what they may have already studied helped them to be aware of relevant prior knowledge from other subject areas.

5.2.2 Personalised content

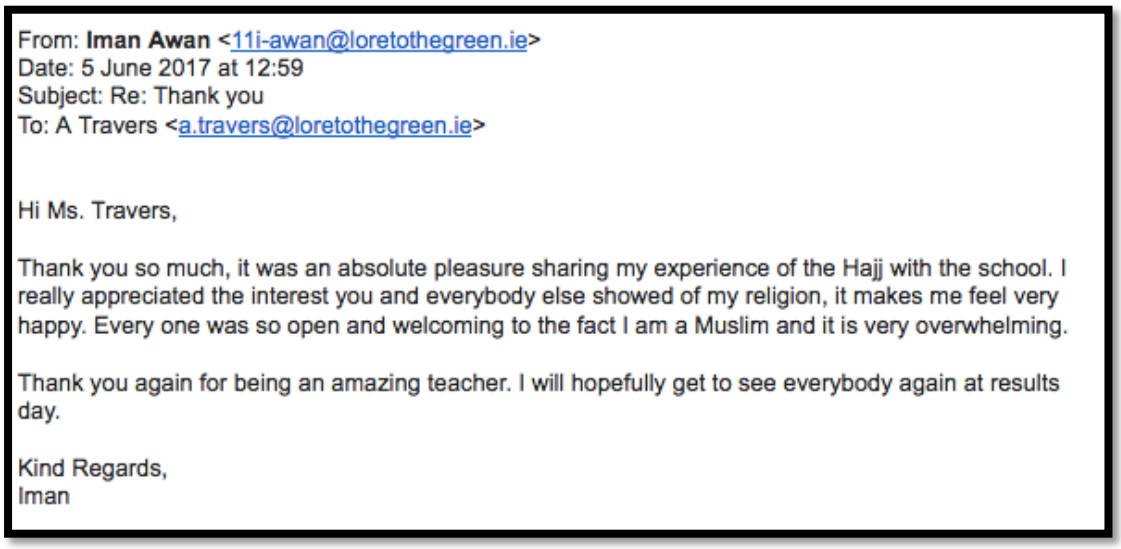
The nature of the content being covered changed as *Wonderlands* provides original context specific content. Integrating technology allowed for the inclusion of a variety of original content including audio and video clips created specifically for the curriculum. This reflects my vision to create a personalised curriculum in order to further engage my students. The importance of this became evident through the research process, especially from student feedback and observing their reaction to creating and seeing personalised content. The photographs include many of the students themselves and were one of the aspects of the iBook that students commented favourably on, "I loved seeing the pictures from the third year retreat

because my sister was there and I couldn't wait until we got to go there too" (BG17). Figure 5.5 a *PicCollage* that I made for the iBook. It is an example of the unique possibilities when an iBook is written for a specific target audience as it shows both sixth year students and past pupils of our school participating in the pilgrimage. This insight into the pilgrimage tradition is something the students loved learning about. "The lesson on Lourdes was great because my brother went there with his school and it was nice to see what it would be like if I went there in sixth year" (BG4).

Figure 5.5: Personal photographs for the curriculum

Original content created specifically for the curriculum includes interviews with members of the school community. These added a unique dimension to the work. Inviting a variety of voices to participate helped to ensure that the curriculum was inclusive and respectful of all the beliefs and backgrounds represented in our school community. As I reflect on the impact of the research on creating personalised

content the highlight was the interview with a student who had been on the Hajj, the Muslim pilgrimage to Mecca, with her family. The positive impact of her participation in the research is evident from an email I received from her when she graduated:



From: **Iman Awan** <11i-awan@loretothegreen.ie>
Date: 5 June 2017 at 12:59
Subject: Re: Thank you
To: A Travers <a.travers@loretothegreen.ie>

Hi Ms. Travers,

Thank you so much, it was an absolute pleasure sharing my experience of the Hajj with the school. I really appreciated the interest you and everybody else showed of my religion, it makes me feel very happy. Every one was so open and welcoming to the fact I am a Muslim and it is very overwhelming.

Thank you again for being an amazing teacher. I will hopefully get to see everybody again at results day.

Kind Regards,
Iman

Figure 5.6: Email from student in appreciation of participation in project

The celebration of diversity that we foster within our school community was evident as staff and students willingly shared their personal experiences and perspectives. For example, some students spoke about volunteering in Lourdes and appreciating the sense of peace they felt there in spite of not being religious while others shared how this was a special place of pilgrimage for them and their families. While *Wonderlands* celebrates diversity it also helps to show our oneness in the common search for meaning and sense of awe and wonder that can be found in sacred places.

5.2.3 Real word relevance

The blending of content, technological and pedagogical considerations stems from my desire to anchor learning in real-world or authentic contexts. Discovering widgets opened up a whole new range of possibilities and transformed the iBook with a wide range of interactive features to ensure that the content that learners engage with in the *Wonderlands* curriculum are situated in real world contexts that have personal meaning and relevance for the students (Bonk and Cunningham, 1998). This enabled the creation of an authentic educational context, which allowed

deeper understandings to be achieved (Herrington, Herrington and Mantei 2009). The added technological functionality influenced the content included. First of all, it increased the amount of content feasible to include within the iBook. Figure 5.7 is an example page from the iBook. While it has very little writing it provides a lot of content. The Vimeo widget presents a twenty-minute documentary about Lough Derg and the photo gallery widget contains a selection of photographs taken on the sixth year retreat there.

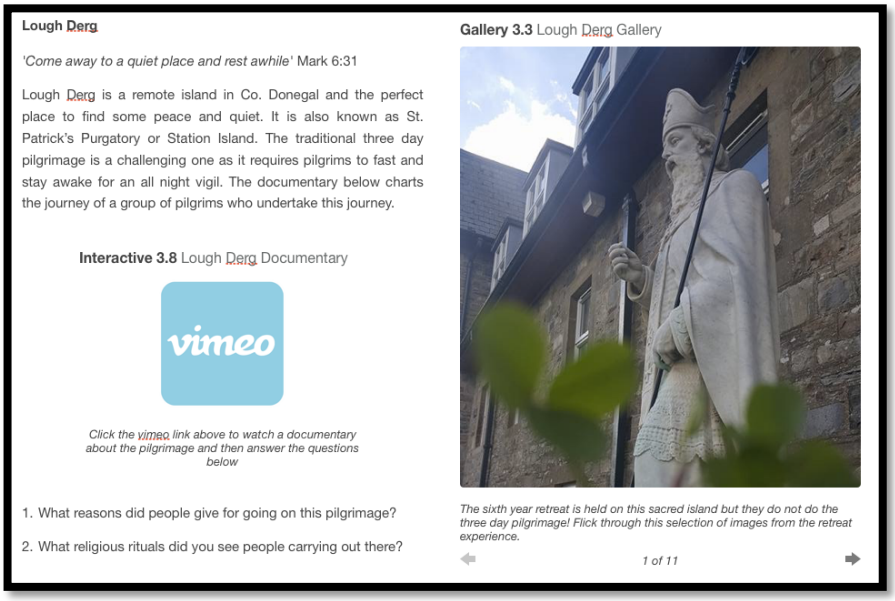


Figure 5.7: A sample page with Wonderlands content widgets

Widgets also allowed for a safe way to include web links. Aware from the literature of the concerns about digital distraction (Selwyn 2016; Butler 2015; Cuban 2015; Sousa 2011) providing direct links to specific web pages minimised the students wasting time or getting distracted browsing the internet. As I explored the variety of widgets available this too had an impact on decisions I made about content. For example, when I discovered widgets for social media accounts I decided to incorporate these, as seen in figure 5.8. This is not something I originally imagined would be possible and it worked really well.

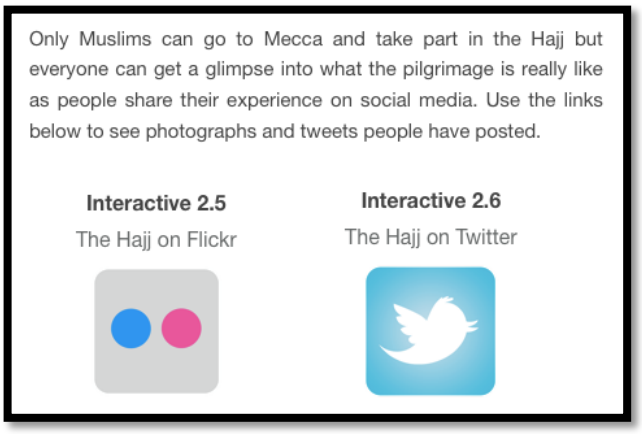


Figure 5.8: Social media widgets

The assignments were also designed to show a relevance to the real world. Again, integrating technology with content and pedagogy, the students were asked to imagine they were the social media representative for Croagh Patrick or Lough Derg and write three tweets they would send during the pilgrimage. The student reaction to this activity was very positive and a sample of their tweets can be seen in figure 5.9.

Figure 5.9: Sample digital disciple student work

The final project was also designed with a real world context in mind. As seen in figure 5.10 students are asked to imagine they are travel agents, giving them a focus for the content creation for their iBook.

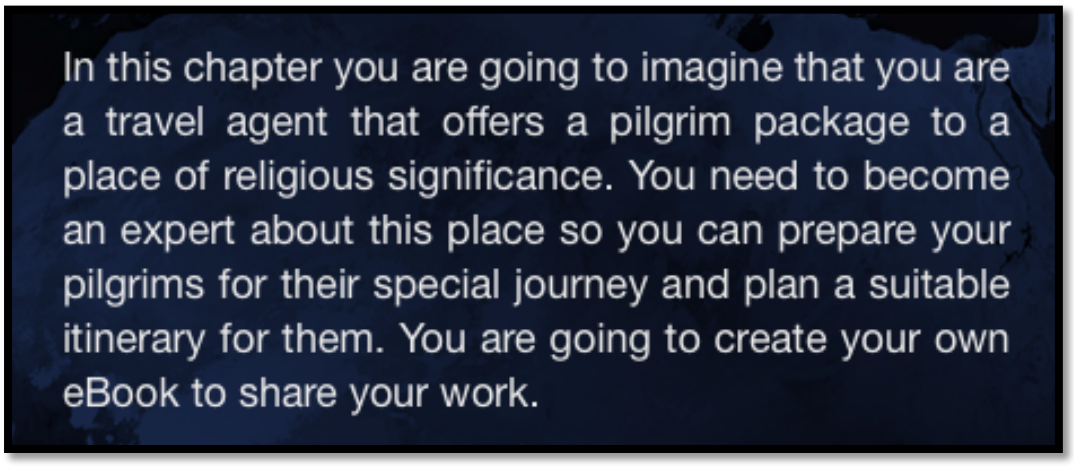


Figure 5.10: A project situated in a real world context

Observing the student interaction with these activities, as well as from their feedback and my colleagues feedback it was evident that they found the content engaging.

5.3 Improving workplace practice

The process of being involved in the development and piloting of the *Wonderlands* curriculum was a transformative experience for my co-creators. One of my aims for this research was to benefit my students learning in a 1:1 environment. The positive impact of this research on them is evident in two main areas:

- Facilitating collaboration and engagement
- Fostering creativity and innovation

My colleagues and I in the RE Department also saw a transformation in our collaborative and creative efforts. Further transformation of the research on my workplace was evident in a wider context as ideas were shared that spread throughout the school. This research contributed in a positive way to our changing eCulture.

5.3.1 Facilitating collaboration and engagement

The Horizon report (Johnson et al. 2015) highlighted collaboration as one of its key trends. This is also integral to the EEA where the knowledge created is part of a cooperative process involving the practitioner and the university while also linking

to the wider social context (Crotty 2014). The feedback from my students and colleagues on the collaborative nature of the *Wonderlands* curriculum was incredibly positive. "I think as a department we have worked very well together and I have enjoyed seeing the students work so well together to achieve great things" (Aoife, Feedback received at RE meeting 04/05/16). The collaboration needed for this project was in itself transformative as it was a big shift from the individual assignments needed in examination RE classes. Reflecting on the experience the students learned from working together. "I liked how we got to work together on our iBook because we had a lot of fun and were able to share the work and learn from each other" (Student CG18). When the students collaborated to share their ideas it helped to spark more creativity. "When we discussed our ideas for the iBook we got really excited and that's how we came up with the idea to write and record a song" (Student CG4). The student levels of engagement and motivation are evident from their enthusiasm when reflecting on the work.

Students planned and recorded the student interview about the Hajj, as a collaborative class project. The students used *Padlet* to plan the questions they wanted to ask. A screenshot of their *Padlet* wall can be seen in figure 5.11. The final project as outlined in the previous chapter is for the students to create their own iBook. These iBooks can be combined to produce one iBook for the whole class. *Padlet* allowed all students to collaborate and shape the direction of the project on an ongoing basis.

As well as collaborating to plan their project students were also invited to collaborate to edit each other's work. The peer review and peer learning elements of the iBook creation were especially transformative for the students. Students were excited that they were creating work for a wider audience as opposed to just work for their teacher to read. This engaged them and motivated them to want to produce quality work, and they appreciated the benefit of peer feedback to help them improve their work. "It was helpful to have someone else read over our work. I was able to fix my mistakes before everyone read it" (Student CG9). This transformation mirrors my own and it is rewarding to see how this research facilitated this.

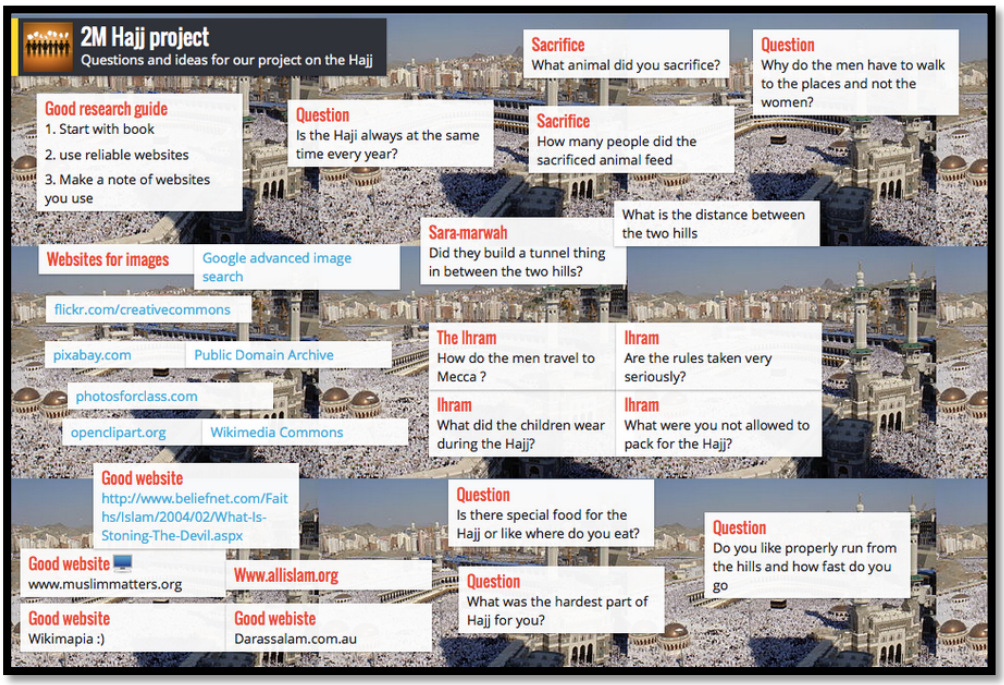


Figure 5.11: Evidence of student lead learning

The opportunities to collaborate extended to the wider school community. To create original content relevant to our school community staff and students were invited to share their experiences of visiting places of religious significance. Students collaborated with staff to arrange, record and edit interview using the iPads. See figure 5.12. This willingness to collaborate greatly enhanced the content, as students were fascinated to hear their teachers, across all subject departments, share their personal stories. "I can't believe so many of our teachers have done the Camino and they all seem to have enjoyed the experience" (Student CG10)

Figure 5.12: Evidence of student and teacher collaboration

Staff collaboration with each other was equally important to this research. This was especially evident among members of the RE department. With a unique opportunity to reflect on the changing context of our subject and our access to new technology our co-construction of a new curriculum transformed our ways of collaborating. Like the students we also embraced technology to collaborate with our resources now kept online in shared folders using Google Drive as seen in figure 5.13.

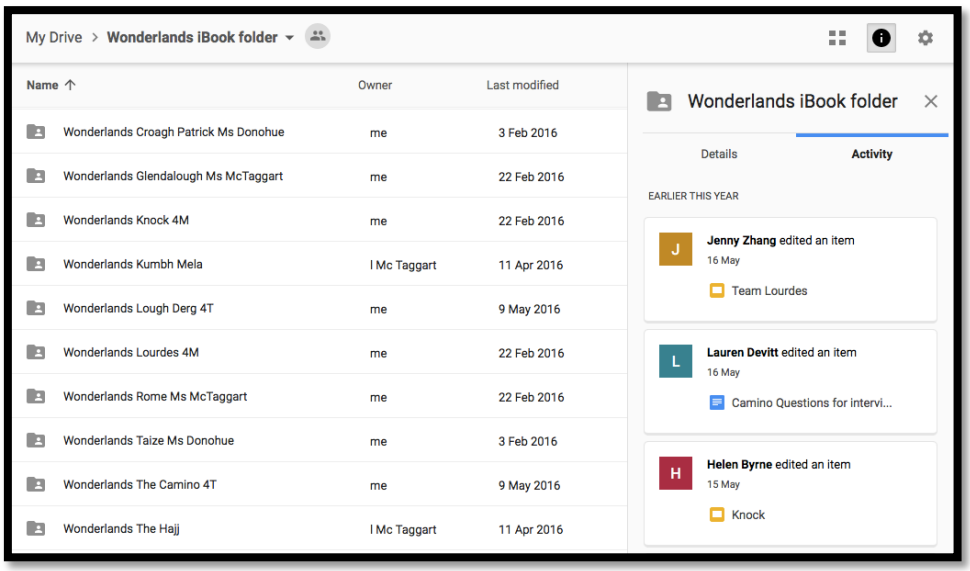


Figure 5.13: Screenshot of our shared Google Drive folder

On a deeper level our general openness and ease at planning and reviewing our work together has improved. In the same way that the students who collaborated on projects came up with more imaginative ideas and approaches, it was the same for us. Sharing ideas and reflecting on our work at a deeper level allowed us to also be more creative in our teaching. We always worked well as a department, but our ability to co-create resources and learning activities has transformed our work. One of the underlying motives for this research was to address the concern the RE department had about student engagement in non-examination RE. The findings of this research indicate high levels of participation and motivation over the three years of the Junior Cycle RE programme.

5.3.2 Fostering creativity and innovation

One of the transformative benefits of collaboration was enhanced creativity as was evident in the work that the students produced. Through this research students were

empowered to become creators of content rather than consumers of content. The aim was to encourage students to embrace their creativity in their content creation. A key factor in fostering student creativity was inspired by Bonk and Cunningham's (1998) recommendation to use activities with choice, novelty and personal interest. This was further enhanced when integrated with the idea of 'App Autonomy' described as a way to increase pupil motivation and enhance critical thinking, creativity and innovation; (Edge 2016). The final project ensured that students had ownership of their learning as they had the freedom to choose any place of pilgrimage they wished for their research. They had further autonomy over their project by being able to choose any technology tools they wished to create the content for their iBook. Sharing the marking scheme ensured all students were aware of the success criteria but avoided what Williams (2013) had referred to as reducing writing to checklist management. The marking scheme included a section on creativity that asked if the group used their talent and skills to create something original and it is clear from the student iBooks that this new approach to assessment was successful. Students embraced "app smashing" (Kulowiec 2013) and created original content for the project using a variety of apps such as PicCollage as seen in Figure 5.14 to enhance the design of their iBooks.

Figure 5.14: Student created PicCollage poster of the Camino de Santiago

Being able to share ideas from the pilot of the iBook project in the second year of this research sparked creative ideas for new classes using Book Creator for the first time. The song about the Hajj that one class wrote in second year inspired a class to write a rap about pilgrimage in Hinduism the following year. The evidence for the creativity and innovation that was fostered and how they embraced their individual talents and skills is found in the work the students produced as seen in the screenshots from student created iBooks in figures 5.15 to 5.17.

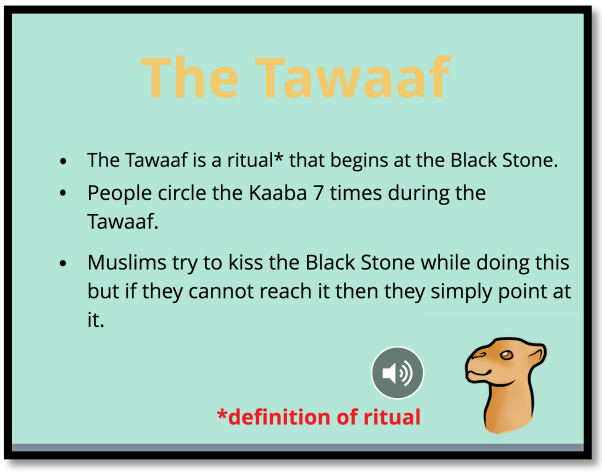


Figure 5.15: Student iBook with audio definitions

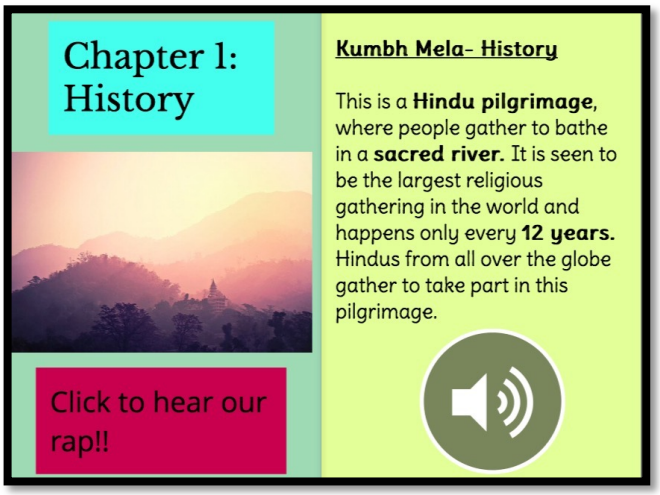


Figure 5.16: Student iBook with an original rap

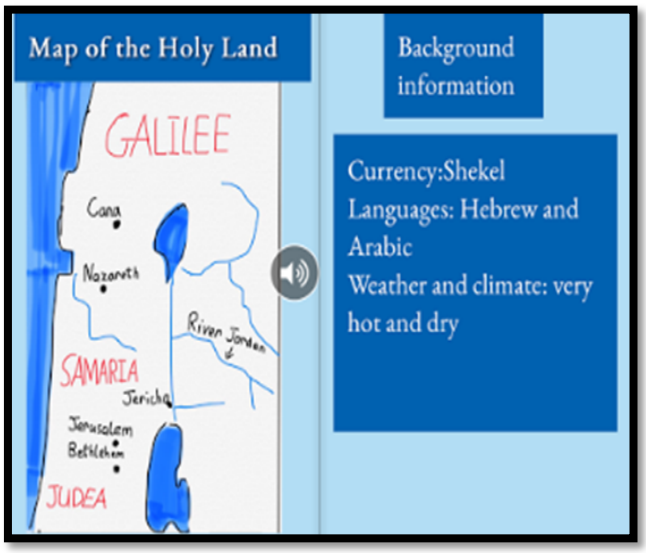


Figure 5.17: Student hand drawn illustrations

When first year students had the opportunity to learn about The Holy Land by reading the iBooks created by third year students they were eager to create their own thus reaffirming the sense of motivation students have for this type of creative activity. They were further motivated by the thought of other students reading their iBooks in the future. The use of the *Book Creator* App is now a regular feature in classes being used for a variety of topics. The students' positive engagement with this research through all the research cycles and with the completed *Wonderlands* curriculum is evident in the high levels of creativity and innovation shown in their work. The creative spark is definitely lit and spreading among the students.

5.3.3. Contributing to a changing eCulture

The impact of this research has had a positive impact on the whole school community. Ideas for integrating the iPads are regularly shared among colleagues and word is also spreading among students. I recorded one example of how students inspired the sharing of technology tools in my journal.

> My colleague Carol asked me about *Kahoot*. She said her business class asked her if they could use it to review a chapter they had completed. They said they used it with me in RE class and it was brilliant. She was intrigued by their enthusiasm. I was delighted to show her how it works and to hear of how much students liked it *(Journal entry extract, 05/12/15)*.

As word about *Kahoot* spread among staff and students I was asked to present it to all my colleagues at a staff meeting on 04 May 2016. It is now widely used within our school and is still as popular as ever with the students. Getting other teachers involved in the *Wonderlands* curriculum opened up conversations about our ideas for integrating the iPads in RE. My colleague Laura McTaggart and I presented the work we had completed in the RE department to the whole school at a staff meeting. We encouraged others to try similar projects. Here is a link to the Prezi we presented. We explained that our focus is still teaching religion, not technology. We explained how we collaborated to learn from each other and from the students. This was a worthwhile lesson for our colleagues to see that you don't have to be an expert in technology to embrace it.

Demonstrating the *Book Creator* app proved how simple and user friendly it is and reassured colleagues that students using it for the first time were able to do so without needing too much instruction on how it works. This allowed us to stay focused on helping them reflect on the content. The response was overwhelmingly positive and as a result all the student iPads now come with the paid version of *Book Creator* app installed. Colleagues have started to create iBooks with students in other subjects and some teachers have used the app to create their own iBooks to share with the students. The SPHE co-ordinator was inspired to get all Junior Cycle students to use the *Book Creator* App as an ePortfolio platform of their work, adding pages of content and reflections after each topic. The potential of student created iBooks to be used in this way exceeded my expectations and has had a positive impact on my workplace. Our new eCulture continues to evolve and I'm proud of the contribution this research has made to my workplace.

5.4 A transformative research journey

Reflecting on my journey at a theoretical level it is evident that the TPACK framework (Mishra and Koehler 2006) that shaped my curriculum has improved my professional practice. This research allowed me the opportunity to reflect on the content, pedagogy and technology involved in teaching RE. As a result I can now make better-informed decisions when choosing what I am going to teach, and how I am going to teach it, confidently planning my lessons in an integrated way. The SAMR framework (Puentedura 2006) has proven to be a useful guide to identify the

times I have moved beyond substitution and augmentation to allow technology modify and redefine my work. I have embraced technology to do things that were not possible before and this has redefined my approach to the RE curriculum. The research has also taught me that the SAMR framework is best viewed as a swimming pool rather than a ladder (Hooker 2014), which helps me to balance my technology use with a variety of offline approaches. An important lesson I have learned in integrating technology in my teaching is to understand that sometimes not using any technology is the best option. The transformative impact of this research on me has an impact at both a personal and professional level. My pedagogical approach when teaching has improved after developing new knowledge and skills. I have developed new digital skills resulting in a very practical transformation in my use of technology. Finally, this research has had a profound impact on me at a personal level this research experience was an intense opportunity for growth. As a result my self-awareness and confidence has improved.

5.4.1 New digital skills

At a practical level I have developed new digital skills throughout this research journey as I investigated apps, websites and technology suitable for use in RE. I learned how to use the *Book Creator* App and I am able to facilitate my students writing, editing, designing and publishing their own iBooks. The finished curriculum shows the influence of my experience experimenting with numerous apps and websites with my students as outlined in chapter four. Building on this and from feedback during the create phase of the research the final curriculum includes relevant ideas for the use of a variety of apps and websites to help facilitate students in creating content. In choosing to create an iBook artefact, I knew I would be testing my technical abilities. Successfully creating my own iBook using *iBooks Author* brought together my newly acquired digital skills in an integrated way. The iBook artefact is evidence of how, building spirally (Bruner, 1966) on the creativity, ingenuity and analysis of previous work, an improvement in my use of digital technology has occurred as a result of this research.

The approach I take to my own Continuous Professional Development (CPD) has changed. Taking control of my own CPD when I needed to learn how to use *Book Creator* and *iBooks Author* I realised how easy it is to access online training and

support to learn new skills and improve my practice. With help from online blogs, video tutorials and the Twitter community I was able to find answers and inspirational ideas to take my practice to a higher level. I am committed to continuing to take control of my own CPD going forward, determined that my professional transformation continues. It is evident that I am now more confident using the iPad in education. Part of this confidence comes from the realisation that I don't have to be an expert in every aspect of every app. I can empower my students to showcase their digital skills and talents and learn with and from them.

5.4.2 New ways to integrate technology in education

As a reflective practitioner during this research, I have had the opportunity to reflect on and articulate my professional values and actions. Through my involvement in each stage of the EEA I developed an informed voice that has enabled me to advance my understanding of my teaching practice, specifically my role in a 1:1 classroom environment. The experience of being an action researcher has deepened my self-understanding of my work. Exploring my educational values and developing a deeper understanding of my practice helped me to realise the importance of asking the right questions throughout this research journey. I was certainly guilty of asking the wrong questions when I began teaching with iPads. I asked a lot of *what* questions like:

What apps should I use to teach RE?
What can I do with the iPad with the third years?
What should I use to teach about pilgrimage?

Influenced by Hannam and Ashcroft (2015) who pointed out that 'only by mastering pedagogy can you truly master the technology' I began to realise that my approach had to change. By changing these to *how* questions I began to broaden my focus to include the process and pedagogy that underpins successful technology use in the classroom.

How can I use the iPad to teach RE?
How can I use the iPad with the first years?
How can I teach about pilgrimage with the iPad?

My approach further transformed when I moved from asking 'what' technology I was going to use to asking the '*why*' questions (Ferriter 2013). This shift was the most important turning point in my approach to integrating technology in the classroom. This brought me back to looking at the big picture; to reflect on the potential difference that technology can make by providing the opportunity to live out my educational values of courage, creativity and collaboration in a new way.

5.4.3 New pedagogical preferences

Many educators, myself included, take an eclectic approach to lesson planning that includes strategies and techniques from a variety of theoretical perspectives. However, in designing a curriculum I wanted to consciously consider an appropriate learning theory upon which to base my work. An intentional focus on learning theories has had a transformative impact on my workplace practice. It has moved my practice from the traditional teacher-centred model in which knowledge is "transmitted" from teacher to learner towards learner-centered, social constructivist and collaborative learning approaches. From the start the *Wonderlands* curriculum set out to engage and motivate students. The literature indicated the importance of student ownership of learning and autonomous learning (Bonk and Cunningham 1998). Students were given control over a variety of learning activities.

Students used *Padlet* to co-ordinate their different roles for the project. Figure 5.18 is a screenshot of the *Padlet* walls. From this it is evident that each group interpreted the task in their own innovative way, developing a unique approach to researching and creating content on their place of pilgrimage. In keeping with a constructivist learning environment the students had complete ownership over the roles they would assume for the project and each group managed to remain within the agreed specifications. Students actively led and regulated their own learning, assigning tasks, collaborating and sharing resources.

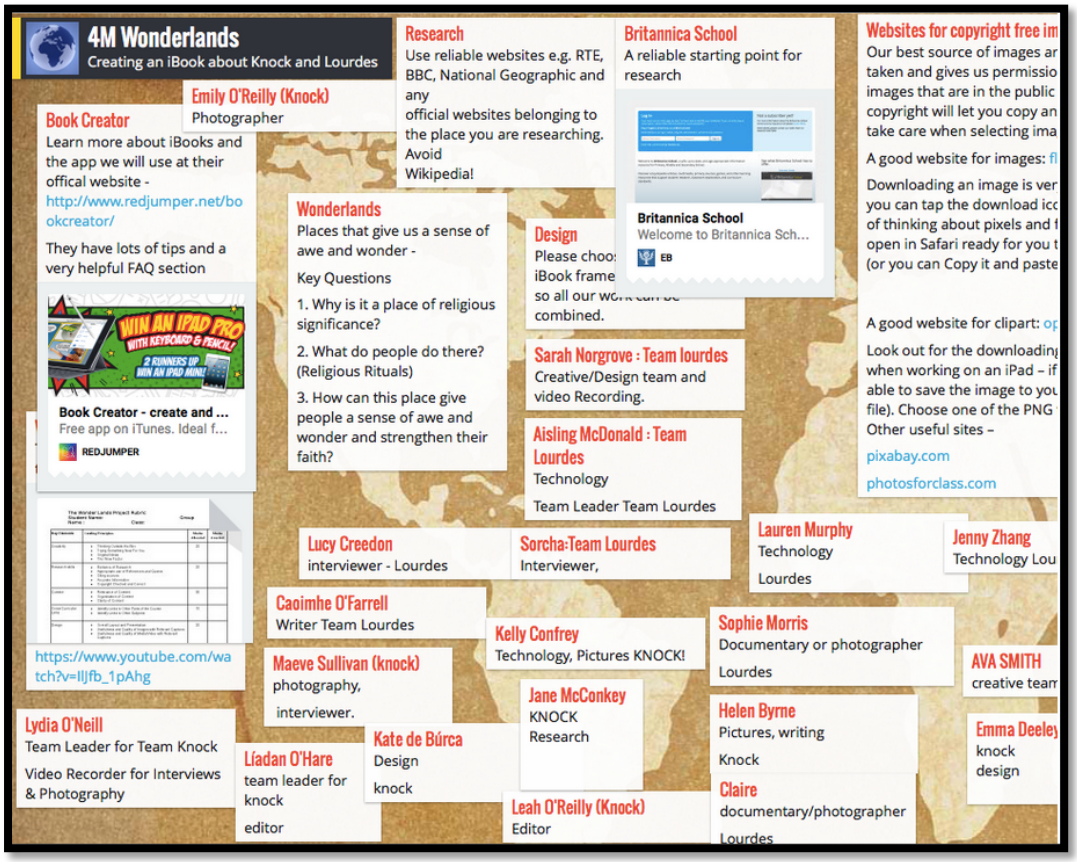


Figure 5.18: Evidence of empowering autonomous learning

Throughout the whole process I facilitated and supported the learning rather than instructed. My pedagogical preference to become the 'meddler in the middle' (McWilliams 2012) had become a lived reality.

The changes in my pedagogical approach were reflected in a transformed classroom layout to ensure students were able to work together. One of my earliest discoveries when I began teaching with iPads was that the traditional classroom layout of rows is not very conducive to teaching in a 1:1 environment. Firstly, when students are sitting in rows with iPads you can't see what they are doing. Secondly, I noticed that students often worked on the iPads at a self-directed pace and were often doing different things at the same time so I needed to be able to move around the classroom more to check in with them individually and answer questions. Thirdly, as I embraced the opportunity iPads gave to have students work collaboratively, it made sense for them to sit in groups rather than rows. I decided to redesign my classroom layout. There were not many options available because my classroom is small and

oddly shaped but I was able to arrange the desks into five groups of tables. See figure 5.19. This not only facilitated five natural groups for collaboration but I can now easily move around it, literally being the 'meddler in the middle' of my classroom. The physical change reflected the shift in mentality and pedagogical approach.

Figure 5.19: My new classroom layout

As I reflected on how this research has impacted my professional practice I summed up my feelings in my journal:

> "This research has transformed my teaching. There are so many advantages compared to my previous teaching style! I cannot think of any other way I could teach now without embracing collaboration and creativity, regardless of whether there is technology involved or not". *(Journal entry extract, 05/05/2017)*

The transformation in my practice is centred less on the technology and more on the new found comfort in being the "meddler in the middle" (McWilliams 2012) of my classes rather than the sage on the stage. The transformation in my professional practice that has occurred is evident outside of the RE context. I have witnessed the impact of this transformational research with all my classes in all my subjects. Since reflecting on my educational values I have noticed that I am doing more creative

projects and group work with all of my classes. I am finding new ways to collaborate with colleagues within my subject departments, and I am continuing to take the initiative to try new technology tools and share my ideas with others.

5.5 The transformative power of performance

The EEA includes a 'performance' element that gives researchers the opportunity to share their work to receive feedback and further their thinking to ensure the creation of a quality artefact (Crotty 2014). As well as presenting my work at the validation meetings that took place throughout the research process I had the opportunity to share my work to a wider audience on a number of occasions. This was important as it afforded me the opportunity to further my understanding of the literature by preparing presentations that explained how I moved from theory to practice. Opportunities to share my research with a wider audience also helped me to see the relevance of my research outside of my workplace. The performance element of my research has helped me to grow in confidence, believe in myself and learn to take risks. All of this has contributed to a personal transformation. In the past I hesitated to share my work with others until it was complete, out of fear that it was not good enough. Facing this fear has allowed me to further embrace my value of courage. I now see that sharing my work, while it is still in progress, is the only way to get the feedback you need to make your work better. I have also gained the confidence to distinguish between making changes based on feedback or standing by my instincts on what is needed and what may be in excess of requirements. I now strive for progress rather than perfection in all I do. Having the opportunity to 'perform' throughout the research brought about important transformations and insights, which I will now outline.

5.5.1 Exploring

In the earlier stages of the research I had the opportunity to present at the Loreto Network RE Teacher Day on January 29th 2015 and at the Irish Schools Head Association (ISA) networking day on November 12th 2015. On both occasions I was invited to share my experience of teaching in a 1:1 classroom and provide ideas for teachers who wanted to integrate technology into their teaching. I was still exploring new ways of collaborating and creating but preparing these presentations helped to clarify my thinking. I received wonderful feedback on both days. From this I was

encouraged to continue to strive for excellence in my research confidant that it would be of value to other teachers. I was also able to identify how my own approach to professional development had changed from when I lead CPD training for teachers during my time working at Veritas. I now integrated technology into my presentations to facilitate a collaborative approach. Figure 5.20 is a *Padlet* wall of resources and reflections from the ISA day that is evidence of this.

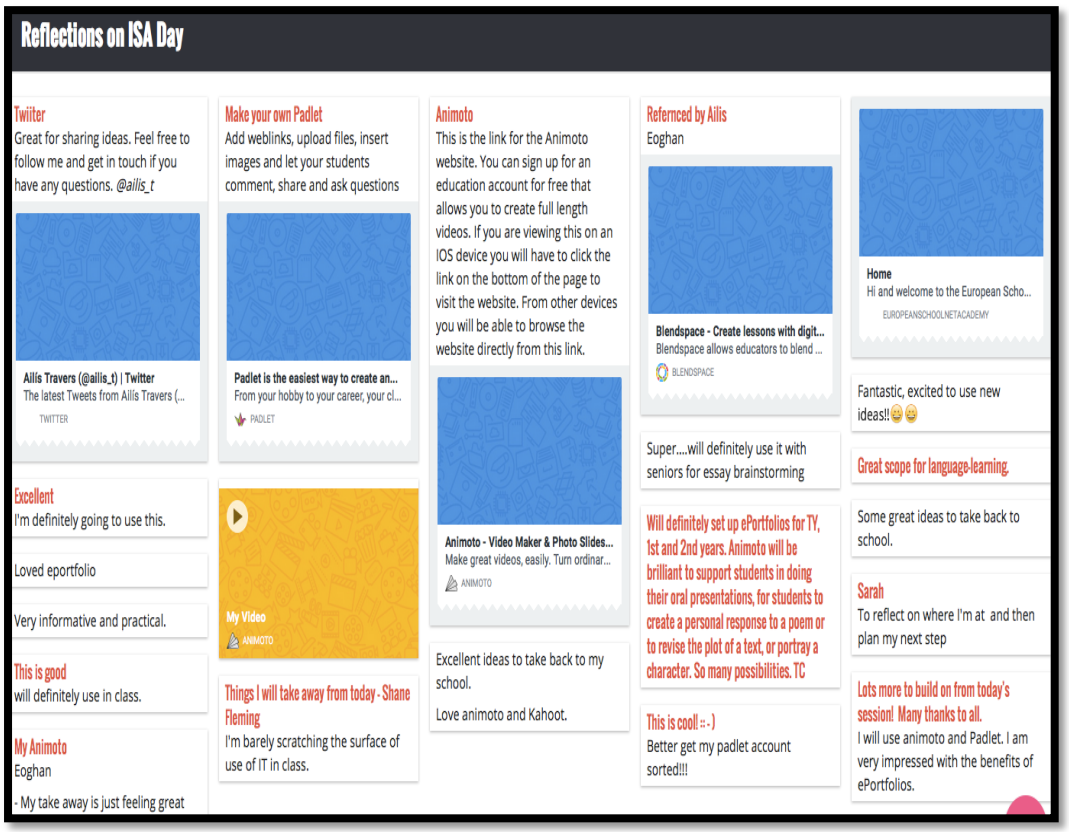


Figure 5.20: Screenshot of ISA Day Padlet Wall

5.5.2 Understanding

During the second cycle of action research two opportunities to share my work occurred that saw my understanding of my work transform. First of all I presented at the Mobile Technology in Initial Teacher Education (MiTE) Conference in Galway on January 15th 2016. This international conference had speakers from around the world and while it was intimating to present alongside national and international leading experts in technology in education it was a very worthwhile experience. My own research benefited from the expertise of others and provided me with the reassurance that my research was on the right track. I also felt validated in my work

as I realised that as a result of my research I had a valuable contribution to make on the use of iPads in education. This realisation was reinforced with the positive feedback I received after my presentation including Tweets as seen in Figure 5.21 and 5.22

Figure 5.21: A Tweet about my presentation at MiTE: sharing my values

Figure 5.22: A Tweet about my presentation at MiTE: Sharing my journey

The second opportunity for sharing my work came when the RE Department submitted our students' iBooks to the Association of Creativity and Arts in Education. We were honoured to receive their *Creative Schools Award* for our work on the *Wonderlands* curriculum. (See figure 5.23). This recognition was a great boost to my confidence in owning my value of creativity and understanding how this research was transforming my workplace and bringing that value to life for others.

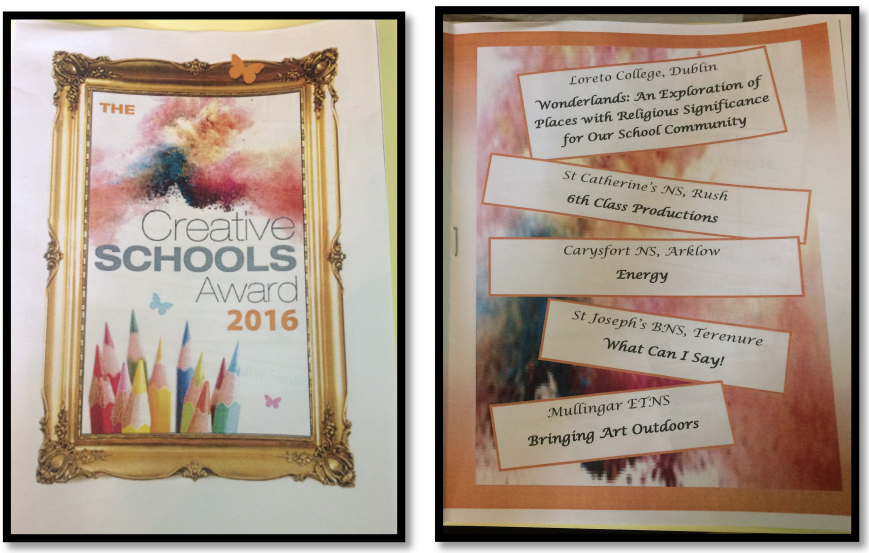


Figure 5.23: ACAE Creative Schools Award

5.5.3 Creating

I was extremely honoured to be selected to showcase the work that I was creating and stand behind my research at *Féilte*, the Teaching Council Festival of Learning on October 1st 2016. Sharing my research with a wider audience of fellow teachers, educational practitioners and industry leaders brought new insights. Speaking with primary school teachers opened my eyes to the wonderful work that was being done with technology at this level and served as a good indicator of the variety of digital skills that students reaching post-primary classrooms are going to arrive with. It was easy to see the relevance of my research for the primary school context, as the TPACK framework is equally applicable for planning integrated lessons at that level. Demonstrating the *Book Creator* app for primary school teachers and revealing just how simple it is to use gave me newfound confidence in my ability to share my research with a wider audience in a meaningful way.

Figure 5.23: Féilte showcase with my colleague Stephenie

A final chance to showcase my research was at the annual Loreto Network RE Teacher Day on February 3rd 2017 at which I presented with my colleague Laura McTaggart. Having presented at the same conference two years earlier I reflected on how my work had progressed in that time:

> Discussing my work and explaining the process involved reminded me of how far I have come and appreciate the spiral of improvement that I can see in my practice. Invited to speak about technology I found that my presentation naturally integrated content and pedagogy too. I asked my colleague Laura to present with me so we could share how we collaborated and co-created a new approach to using technology in RE in our school. This made it all the more relevant to our fellow RE teachers and the response was overwhelmingly positive *(Journal entry extract, 04/02/17)*.

All of these opportunities to 'perform' and subject my research to the scrutiny of others helped to ensure I produced quality work. From every experience shared I gained new insights to improve the performance of the curriculum and artefact that I created. Following the rigorous process of the EEA (Crotty 2016, 2014) pushed me outside of my comfort zone, helped me develop new skills and grow in confidence making this research process one of genuine personal transformation. This research journey has not just transformed me, but has helped me rediscover talents, reignite passions, and renew my love of teaching and learning.

5.6. Chapter summary

In this chapter I reflected on the transformative impact of this research for the students, the RE department and my colleagues in the wider school community. Following the guidelines for the fourth and final stage of the EEA (Crotty 2014) allowed me to step back and look at the multimodal artefact I created as a result of this research. As I examined and evaluated the effect of implementing my research in my workplace it was clear that transformation had occurred and I shared evidence to show this. Turning inwards I had the opportunity to reflect on how this research impacted me at both a personal and professional level and concluded that it was a truly transformative experience. As the quote at the start of this chapter says:

> I can't go back to yesterday because I was a different person then.
> Lewis Carroll, Alice in Wonderland

CHAPTER SIX
CONCLUSION

Begin at the beginning…and go on till you come to the end: then stop.
Lewis Carroll, Alice in Wonderland

6.1 Introduction

There is a well-known saying that suggests, "It is the journey that matters, not the destination". This is true for people who go on pilgrimage and is also true for my research journey. The destination I had in mind was the creation of an innovative curriculum about pilgrimage. This was only possible after moving mindfully through each step of the research journey, guided by the EEA's signposts that helped me to explore, understand, create and transform. Throughout each step I learned valuable lessons, gained new insights and gathered data that all helped me to reach my destination. The writing of my thesis has been part of my reflective process and, as such, it has had the power to transform my thinking, rather than just being an end product of my action research. In this concluding chapter I will revisit my research question in order to examine how I achieved my research aims. I will also outline the potential areas of significance this research has for a wider context and offer my recommendations arising from this research. This chapter concludes with an outline of how this research contributes to the formulation of new educational knowledge.

6.2 Revisiting my research question

The question I sought to answer in this research was:

> *How can I create an innovative curriculum for religious education in a post-primary school in Ireland that integrates technology, pedagogy and content?*

This research successfully found answers to the question and, as a result, I was able to design *Wonderlands*, an integrated curriculum for RE. At the start of this research a number of aims were identified:

- To improve my pedagogy and student learning in a 1:1 iPad environment. (A 1:1 iPad environment is one where students have access to their own individual iPad).

- To explore the potential of iPads for facilitating student collaboration and creativity.
- To engage and motivate students in non-examination RE.

The actions I took to develop the *Wonderlands* curriculum and achieve my aims were described in detail in chapter four and chapter five showed evidence of the transformation that occurred as a result. I will now present a brief summary of how this research has addressed the research question.

6.2.1 How the TPACK framework guided my work

It was the TPACK framework (Mishra and Koehler 2006) that facilitated the successful integration of technology, content and pedagogy in the *Wonderlands* curriculum. The seven components of the TPACK Framework (Mishra and Koehler 2006) all helped to shape the development of the integrated curriculum. Table 6.1 provides examples of how I took each component into consideration throughout the planning, creation and implementation stages of this research.

Content Knowledge (CK) *Knowledge of subject matter*	I chose the content for my curriculum from the Junior Certificate RE Syllabus, in particular Section E, Places of Religious Significance and Pilgrimage. I also included my own personal insights from the places I had visited and collaborated with other members of the school community to include their experiences, to create an original and unique aspect to the content being covered.
Pedagogical Knowledge (PK) *Knowledge of the process and methods of teaching*	I enhanced my pedagogical knowledge through my literature review and reflection on my practice. I implemented my findings about 21st Century pedagogy that moved me away from being the sage on stage to the guide on the side or the meddler in the middle (McWilliams 2012). I shared the learning intentions and success criteria with the students to help them take ownership of their learning and focused on active learning methodologies that encouraged collaboration and creation.

Pedagogical Content Knowledge (PCK) *Knowledge that deals with the teaching process for specific subject content*	I applied my knowledge of a Shared Praxis (Groome 1991) approach to RE as a meta-methodology for my curriculum in order to facilitate students learning 'about' and 'from' RE. The curriculum starts with a generative theme and invites students to begin with their 'life' experience before moving to 'faith' and then students are given the opportunity to reflect and appropriate the content for their 'life'.
Technology Knowledge (TK) *Knowledge about various technologies*	I developed my knowledge of technology in education, specifically the integration of iPads, through my research and literature review. My knowledge also grew through my conversations with my colleagues about their experiences, the training we received and cycles of planning, taking action and reflection, all of which were recorded in my research journal.
Technological Content Knowledge (TCK) *Knowledge of how technology can create new representations for subject specific content.*	I mindfully used technology to bring a new digital dimension to the content I was covering. I discerned what technology best suited the content and found platforms that support various elements of the subject specific content.
Technological Pedagogical Knowledge (TPK) *Knowledge of how various technologies can be used in teaching*	I employed a variety of apps and websites suitable for education, for example, *Book Creator, PicCollage* and *Animoto* for content creation, *Padlet* for student collaboration, *Kahoot* and *Quizlet* for assessment and *Showbie* and *Edmodo* to facilitate a digital workflow. My knowledge of these came from trialling them throughout the earlier cycles of my action research, which allowed me to then integrate them into my curriculum.
Technological Pedagogical Content Knowledge (TPACK) *Knowledge required by teachers for integrating technology into their teaching*	I demonstrated an understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) and the *Wonderlands* curriculum is evidence of how I successfully integrated them.

Table 6.1: An overview of the implementation of the TPACK framework

As the literature indicated the main criticism of the TPACK framework is that it does not provide enough assistance to teachers to know what to do with it (Finger et al

2013; Dilworth et al 2012). However, from my implementation of it I agree with Hofer and Harris' (2015) suggestion that teachers can best develop TPACK during the process of designing their own lessons and projects. Throughout the research as I created the *Wonderlands* curriculum I developed TPACK and the framework gave me the "language to bridge the gap" (Jamieson-Proctor, 2013, p. 27) between the research and the design of the curriculum.

6.2.2 A transformed teaching and learning experience

The predominant use of technology in my lessons prior to this research had involved students consuming knowledge by way of viewing PowerPoints, watching video clips or reading material from websites or eBooks. As a result of this research the active creation and co-creation of content increased as I adopted a less transmissive and a more constructivist approach to teaching and learning. The introduction of 1:1 technology empowers educators to take content creation and collaboration to a whole new level, both for themselves and for their students. This for me was the most exciting potential of teaching in a 1:1 classroom. With this in mind the *Wonderlands* curriculum was designed to encourage student content creation and collaboration. The students moved from being consumers of content to creators of content as they embarked on the process of researching, writing, editing and designing their own iBooks. Students collaborated and found new ways to share their learning. I demonstrated how I achieved these aims by sharing examples of my students' work and the processes and platforms used to facilitate their collaborative work in chapters four and five.

The students in fact were both producers and consumers (Herrington, Herrington and Mantei 2009). The students were consumers of content I had created as they were introduced to new concepts of awe and wonder, places of religious significance and pilgrimage in the iBook artefact I produced. The aim to enable students to become creators of content was not just reserved for the final project. Students were encouraged to use their devices to research and links to relevant websites and videos are included throughout each chapter. Each chapter of the *Wonderlands* iBook ends with a 'Digital Disciples' task that requires students to use their digital skills to create content. The success criteria that are shared for these tasks include content and digital components. Exploring the potential of iPads for facilitating student

collaboration and creativity sparked the changes my teaching practice, which been has transformed for the better. My research from exploration to transformation has in turn contributed to enhanced student motivation and engagement.

6.2.3 Have I adhered to my values throughout the process?

The Educational Entrepreneurial Approach to action research began with an exploration of my values in order to have clear guiding principles throughout the research (Crotty 2016, 2014). This research challenged me to fully embrace my values of creativity, collaboration and courage and make changes to implement them in an authentic way to transform my practice. The exploration of my values was an ongoing process throughout this research. They were the signposts that guided the *Wonderlands* curriculum to facilitate student collaboration and support student creativity with an emphasis on content creation rather than consumption. My value of courage allowed me to be vulnerable and take risks that lead to the creation of an innovative curriculum. As a result of this research I have a much deeper understanding and appreciation of the importance of my values. These are not just values I embrace in education, but in my personal life. Living out these values in a more conscious way throughout this research has had a positive impact on my sense of wellbeing. I no longer feel I am a "living contradiction" (Whitehead 1989). My espoused values are embedded in my work and life in a holistic way.

Creativity is contagious. Pass it on.

Unknown

In this research I tapped into my creative talents as I connected my personal experiences and expertise to design and develop an original innovative curriculum. Reflecting on Robinson's definition of creativity as "the process of having original ideas that have value" (2011, p.3) I can see how throughout this research I had original ideas that I put into action. As a result I have created a new curriculum that has value for me, my work place and for other teachers of RE working in a 1:1 classroom. My colleagues and I embraced our creativity to co-create a new approach to RE in our school. This research encouraged my students to embrace their creativity and they became creators of content, with evidence of their creative work shared throughout chapter five. The highlight of exploring this educational

value was seeing how a creative spark was awakened in others too as my colleagues and students shared my enthusiasm for creativity. Teaching can be seen as both an art and a science (Hofer and Harris 2015). An artist is inspired both by what they want to communicate and the possible ways to communicate. In a similar fashion a teacher has a message to convey and creative licence to choose the best method to do so. Engaging my creativity has allowed me to design a curriculum that is more responsive to my students' learning needs and preferences.

If you want to go fast, go alone. If you want to go far, go together.
– African proverb

Collaboration was always going to be at the heart of this research as it is central to the EEA as well as being one of my espoused values upon which I built the *Wonderlands* curriculum. The Horizon report (Johnson et al. 2015) also highlighted collaboration as one of its key trends expected to be evident in education by 2018. My commitment to encouraging student collaboration was increased through my own experience of collaborating with others throughout the research. Throughout this research I learned about my own limitations accepting that even with my subject matter expertise and teaching experience there were limits to what I could create by myself. It was in the process of becoming open to outside suggestions and critique to really take my work to the level it needed to get to. Witnessing how differing perspectives, tastes and levels of subject knowledge enhance my work reaffirmed the need for a collaborative approach to design and creation of this curriculum. This knowledge serves as a transformation for me. The curriculum and iBook artefact were socially constructed in that it relied upon the contribution of others. Without the feedback of my colleagues, students, peers and supervisors I would not have successfully achieved my research aims. While the *Wonderlands* curriculum was a collaborative creation, it also set out to facilitate student collaboration. When I now revisit Meehan's (2016) advice "If real learning is to take place, our classrooms must be dependent on the collaboration of its learners, not solely on the knowledge of its teachers", I can see how I have achieved this. I became the 'meddler in the middle' (McWilliams 2012) and facilitated students working together to develop new knowledge, skills and attitudes. As we implemented the curriculum it evolved into a whole school, cross-curricular project with students and teachers being interviewed

and contributing to the content. This brought new levels of collaboration to the teaching and learning experience in my school, and what we achieved exceeded my expectations. The feedback from my students and colleagues on the collaborative nature of the *Wonderlands* curriculum was incredibly positive.

I would like to be known as an intelligent woman, a courageous woman, a loving woman, a woman who teaches by being.

Maya Angelou

It took a great deal of courage to complete this research. There were times along the way that the road seemed to be paved with obstacles and the stresses and strains of life seemed to overwhelm me. However, I am grateful that I found the courage to persevere. Palmer noted that if we are to truly have the courage to teach "who we are" then "we must talk to each other about our inner lives – risky stuff in a profession that fears the personal and seeks safety in the technical, the distant, the abstract (1998, p.12)." Following the EEA also requires this kind of courage as so much is based around who the researcher is. In the hope of having a strong sense of personal identity infuse my work I found myself reflecting on my inner life much more than I imagined at the start of the research journey. Being courageous in my choices throughout this research allowed me to take risks that lead to innovation and enhanced creativity. I allowed myself to be vulnerable, to strive to create something without any certainty of success and opened myself up to criticism. This level of uncertainty and vulnerability was the key to the success of the research. The constructive feedback received enhanced and shaped the direction of the work. In the most vulnerable moments of not knowing what direction to take the research the support of my supervisors and peers helped me to persevere and moved me to places I had never imagined. The courage to 'teach who we are" (Palmer 1998) is much more achievable when we know who we are. This research has helped me to know myself better, find my own authentic voice and be bold and brave in my convictions. Understanding now that vulnerability and courage go hand in hand has transformed how I see them. At my most courageous I remain open to being vulnerable, and at my most vulnerable I am reminded of my courage.

6.3 Recommendations for integrating 1:1 devices

This research was immersed within the specific context of RE in one post primary school within a specific geographic and cultural context. Therefore findings from this research cannot be generalised but some findings may be transferable to other situations. As Stringer (2004) pointed out it is the reader not the researcher who decides whether the research outcomes maybe transferred to their particular situation. However, it is envisioned that the general recommendations outlined are transferable to a diverse range of subject areas and situations.

6.3.1 For teachers

Teachers sometimes feel that they are in a race with their students to master new technology, but mastering it to a greater extent than our students is not necessary. If we draw on the TPACK framework we can keep the balance between content, pedagogy and technology to enhance what we already do. The following general recommendations drawn from this research are presented for teachers who wish to integrate technology, pedagogy and content in a 1:1 classroom:

- You don't need to be a technology expert but you do need to be willing to step out of your comfort zone and try new things.
- Take control of your own CPD and take advantage of the free material online to inform, instruct and inspire your integration e.g. Join #edchatie Twitter chats.
- Find the 'digital champions' within your school to share innovative ideas with.
- Learn from your students, be willing to look and listen to how they are using the devices in their own time or in other classes.
- Conduct an audit of apps that students have access to and have used on the device.
- Focus on integrating a few key apps that can be used in a variety of ways.
- Encourage students to engage in peer teaching to help share technical expertise and resolve technical issues.
- Establish a digital workflow that maximises the potential of the 1:1 classroom.

- Set clear guidelines for acceptable use in your classroom (ideally following a whole school policy).
- Regularly monitor students' online work.
- Model ethical behaviour in sourcing and sharing digital content with your students.
- Help students develop good research skills.
- Focus on your learning outcomes first when planning integrated lessons.
- Plan active learning tasks that allow students to be creators rather than consumers of content.
- Align your assessment and share rubrics with students for digital projects.
- Facilitate student collaboration using shared online platforms.
- Create your own personalised content to engage your students.
- Remember creativity is contagious!
- Incorporate regular 'digital detoxes' and 'digital downtime' to help balance the use of technology in both the personal and professional spheres.

6.3.2 For principals

A recurring theme in the literature is the importance of schools providing planning and training for teachers beginning to teach in a 1:1 classroom. This needs to begin before 1:1 adoption and continue regularly throughout. Encouraging and facilitating teachers sharing with each other can provide the simplest and yet most inspiring ideas. As this research showed, part of my transformation was due to the fact that I took control of my own CPD. So many of my ideas and practices have been shaped by the reading that I did for this research that I know other teachers would not necessarily be exposed to. However, for any teacher who wants to grow in their ability and knowledge there are lots of readily available resources online. *YouTube* have video tutorials for technology tools, blogs are available that provide step-by-step instructions for trying new technology, and twitter is full of ideas and real time questions and answers. There are a number of ways principals can help with this to ensure the successful integration of 1:1 devices:

- Allow time at staff meetings for sharing app suggestions or invite staff to formally present and demonstrate what they have found effective in their classes.
- Encourage opportunities to share and circulate online CPD resources among staff.
- It is important to have a whole school discussion on the advantages and disadvantages of 1:1 devices before their introduction and again after adoption. Often advantages being discussed sparks ideas and disadvantages can often be addressed.
- Have a clear whole acceptable use school policy for the devices and review it annually (See N as an example).
- Adopt a whole school Virtual Learning Environment (VLE) so staff and students can co-ordinate their efforts and collaborate seamlessly online.
- Finally, and perhaps most importantly, establish a shared vision on the potential of the devices for student content creation, creativity and collaboration to move their use beyond that of an eReader.

6.3.3 For educational publishers

Following the EEA, which calls for the researcher to draw on their talents and skills (Crotty 2016, 2014a) this research benefitted greatly from my experience gained in educational publishing. It is fitting therefore for me to look beyond the school environment and see how the insights gained from this research can be of use for educational publishers. Educational publishers are also dealing with the onslaught of digital devices in schools. The literature touched on the issue with Clarke and Svanaes recommending "a larger investment by educational publishers and content providers in innovative and compelling interactive educational content" (2012, p.11). From this research I concur that this is needed. Quality content creation is time consuming and if innovative interactive content were available for the 1:1 context it would be a welcome addition for teachers and students. The classroom has changed and resources have to change to. Teachers are paid to teach, and while some teachers share my enthusiasm for content creation, many would prefer to have relevant content provided by educational publishers. A lack of relevant resources leaves teachers caught in the trap of trying to teach with traditional resources at the

expense of actively engaging with the potential of 1:1 technology. My main suggestions for educational publishing in for the 21st century classroom are:

- Books should be "multimodal" which allows many types of learners to engage, and teachers can differentiate
- Provide templates that teachers can personalise for students
- Create self-paced lessons with all materials in one place
- Make use of widgets to make books interactive
- Invest in creating audio and visual content rather than just written text
- Embed activities that encourage students to create their own content rather than just consume content

I hope that my research will help teachers, principals and publishers to see technology as something that can bring a dynamic dimension to education when integrated with content and pedagogy.

6.4 Contributions to new educational knowledge

The significance of this research stems from its transformative impact on my teaching practice and workplace. However, further significance is found in the contribution this research makes to the formulation of new educational knowledge. The research offers an understanding and insight into the experience of one teacher's integration of 1:1 iPads in RE in a post-primary school in Ireland. It can influence future practice for both teachers and educational leaders involved in the implementation of a 1:1 programme. With specific relevance to post-primary RE teachers I would argue that some elements of the new knowledge generated from this research could be considered and customised to suit a wide variety of diverse teaching and learning contexts, including with different age groups and across a wide range of subjects. Finally, it contributes new knowledge to research in the area of technology integration and RE.

6.4.1 An example of an effective approach to ICT integration

The Department of Education is committed to improving and supporting the use of technology in schools but as Brown (2015) warns:

> Introducing the latest learning platforms within the education system does not automatically lead to expanded levels of student access or the most engaging and enlightened kinds of pedagogy.

The *National Digital Strategy* (DES) provides a clear vision for the use of technology and the development of digital skills in education. Part of that plan is to share examples of effective ICT integration and this research offers a detailed example. This research confirms what the literature indicated, that having access to technology does not bring automatic changes. Today the digital divide is not between those who have access to technology and those who do not, but it is a digital use divide. As I have outlined, 1:1 iPads can be reduced to eReaders, simply a substitution for textbooks, but the SAMR framework (Puentedura 2009, 2006) shows how much potential these devices have if we have the courage to venture into unchartered waters. This research records the transformative journey undertaken, which shows how teachers can move from using the iPads as a substitution for the textbook to redefine the teaching and learning taking place. Chapter four offered numerous suggestions and tips for new ways of creating, collaborating, communicating and assessing in a 1:1 environment. Hyperlinks were provided making this a useful starting point for those embarking upon 1:1 integration.

In this research I implemented the TPACK framework (Koehler and Mishra 2012, 2006) to integrate the iPad technology with appropriate pedagogy to enhance the content. This model can be utilised in other subjects to create effective 1:1 integration. The importance of utilising the affordances of iPads is highlighted in the literature (Herrington, Herrington and Mantei 2009). Using a constructivist perspective I designed a curriculum for my students that exploits the affordances of iPads. In particular the decision to use *iBooks Author* to present my curriculum allowed me to exploit the specific affordances of iBooks on iPads. I concluded that this platform best suited my work as it was meeting the specific needs of my students, my target audience and allowed multimedia features and interactivity. It complemented the work I was doing with the students and further challenged me to take a risk by moving beyond the *Book Creator* app. Teachers wishing to create their own iBook with *iBooks Author* will find useful ideas in this research. The use of the *Book Creator* app provides a practical example of effective ICT integration as it puts student created content at the centre. The majority of the technology tools utilised in

the creation of the 'Digital Disciple' activities and the student project component for the *Wonderlands* curriculum are not limited to Apple devices. With a growing trend towards 'bring your own device' (BYOD) models in education, students could complete the majority of the *Wonderlands* curriculum on any device, even their phone.

While this research focuses on its use in RE there is no reason why learning about science experiments, key events in history, challenging maths concepts, English poetry etc. would not all greatly benefit from pupil-generated iBooks. This approach can be further enhanced if followed by collaborative self- and peer-assessment and sharing with an authentic audience as illustrated in this research. The journey of integration undertaken and reflected upon throughout this research builds up a clear picture of the opportunities and obstacles facing teachers. Sharing this journey, the evidence gathered along the way and the insight gained all contributes to new educational knowledge for those embarking on similar technology journeys.

6.4.2 An example of a project that develops key skills

The student created iBook project aligns with the Eight Key Skills outlined in the *Framework for Junior Cycle* (DES 2015) The idea of student created iBooks, as outlined in this research, can inspire other schools and similar projects can be used within other subject areas. It is also possible to do this in schools that have a class set of iPads rather than a 1:1 programme, as a recent *Book Creator* update has now made creating iBooks on shared devices easier. It is even possible to create a student iBook with only one iPad. It is an activity that develops many key skills such as research and editing. It is an engaging way to develop literacy skills, including digital literacy, and provides an ideal platform to showcase student talent and creativity. Students are more motivated when they realise they are able to create real iBooks that can be published, downloaded and read by others. Table 6.2 summarises how the different elements of the student iBook project in the *Wonderlands* curriculum linked to the digital component of the Junior Cycle key skills.

Key Skill	**Digital Strand**	**Implementation Examples**
Communicating	Using digital technology to communicate	Students communicated with each other via email, *Edmodo* and a

		shared *Padlet* wall and with me via email, *Edmodo* and *Showbie*.
Being Literate	Exploring and creating a variety of texts, including multi-modal texts	Students explored the multi-modal text I created using *iBooks Author* and they created their own text using the *Book Creator* App. They had to write, expressing ideas clearly and use peer assessment to help edit and improve their work.
Managing Myself	Using digital technology to manage myself and my learning	Students were responsible for saving their own work, meeting deadlines and checking emails, *Edmodo, Showbie* and shared *Google Drive* folders for updates from others.
Staying Well	Being responsible, safe and ethical in using digital technology	Students had to follow the school guidelines for safe iPad use and had to be aware of issues of copyright and plagiarism when creating their text.
Managing Information And Thinking	Using digital technology to access, manage and share content	Students carried out research online and then recorded, saved, shared and analysed their work using a variety of websites and apps.
Being Numerate	Using digital technology to develop numeracy skills and understanding	Students were encouraged to estimate and then calculate the distances involved in travelling to and around their places of religious significance, to put events in chronological order and to create timelines relating to the place they were researching.
Being Creative	Stimulating creativity using digital technology	Students were given the freedom to develop and design their own texts and used a variety of other apps to create original work.
Working With Others	Working with others through digital technology	Students co-operated when creating their texts using a variety of apps and websites that facilitate collaboration. In particular shared *Google Drive* folders and *Padlet* Walls facilitated collaborative work.

Table 6.2: An overview of the implementation of the Junior Cycle Key Skills

The ATS2020 Competences and Skills framework focuses on four main areas: Information Literacy, Collaboration and Communication, Autonomous Learning, Creativity and Innovation (European Commission). As a result of this research I witnessed my students grow in confidence in these competences and skills. The need for teaching students how to use an app should become less as they move through first year and beyond. *Wonderlands* is aimed at third year students whom one would expect have experience using the technology integrated in the curriculum. It is not envisioned that it would be necessary to teach students how to use the apps or websites. However, there may be times when transferable skills need to be isolated and developed. This is vital for app autonomy (Edge 2016). The essential elements of app autonomy are met in the students' exposure to a variety of technology throughout the curriculum. They are invited to engage with captivating mini-tasks in the Digital Disciples assignment in each section of the curriculum. Completing the *Wonderlands* mini tasks, independently or with a partner, allows students discover or rediscover a range of apps and websites. This ensures that students have the knowledge and skills required for the final project and they can start to identify other ways of using them when app autonomy is being facilitated. The students demonstrated impressive initiative when given the space for autonomous learning to happen. The final student project in *Wonderlands* was developed from my new insight into 21st century pedagogy. The research guidelines, assessment rubrics and student reflection on the creative and collaborative nature of the project developed from this research provide a useful example of a project that develops digital skills. This new educational knowledge is of value to all teachers wishing to embrace a constructivist pedagogy.

6.4.3 An original curriculum for RE

The findings arising from this research are especially beneficial to all those involved in post-primary RE in Ireland. It is of particular relevance for those teaching it as a non-examination subject. Within my workplace this research has clarified our approach to non-examination RE. The research highlights content, pedagogy and technology suggestions that were found to enhance student engagement and motivation in non-examination RE. While it is written as a personalised curriculum for my school community, the overall theme is from the syllabus and can therefore

be taught in other schools. As we await the new subject specification for Junior Cycle RE it is already clear that schools will have the opportunity to design and develop aspects of their own programmes. The research offers RE teachers a unique subject specific road map for designing and developing integrated curriculums. Furthermore, this research offers a ready-made curriculum that can be incorporated into new RE programmes. There are teacher guidelines available to support the use of the curriculum and iBook (See Appendix O). Original content was created for the *Wonderlands* curriculum. The iBook is fifty-two pages long. Many of these pages contain layers of content with web links to external websites, videos and photo galleries embedded in it. The content is divided into five main sections, each of which can be used separately, so RE teachers may pick and choose parts that they would like to incorporate into their teaching. The final section, the project guide, can be a very useful starting point for schools introducing Classroom Based Assessment (CBAs) in the new Junior Cycle. The opportunity to share my research on a number of occasions with RE teachers outside of my school context reaffirmed its relevance in a broader context. This research contributes new knowledge for the study of Religious Education at post-primary level through the creation of an original curriculum.

6.4.4 Research contribution

This research can add to the growing body of research on the integration of 1:1 devices. This research concurs with previous research that found that the devices themselves are less important than how they are used to support teaching and learning (Pegrum, Oakley and Faulkner 2013; Melhuish and Falloon 2010). Therefore, this research contributes to knowledge on the general integration of ICT in education as opposed to just on the specific integration of iPads. The literature review identified the need for teacher training and professional development for the effective use of ICT (Hallissy et al. 2013; Pegrum, Oakley and Faulkner 2013; Melhuish and Falloon 2010). This research offers an insight into how teachers can access and complete training and development using online communities and tutorials to great success. The research supports the findings of Hallissy et al. 2013 that showed initial use of 1:1 devices tends to be limited to eReaders. This research offers a unique insight into how the integration journey moves beyond the initial stages by following the journey of one teacher over the first three years of 1:1

adoption. This research provides enlightening evidence of how the introduction of 1:1 devices can impact on an individual teacher and the level of adjustment needed. It offers an example of evidence-driven, innovative practice in a 1:1 environment. At a theoretical level this research adds a unique dimension to existing research on the TPACK framework (Mishra and Koehler 2006) by applying it in the context of RE in a post-primary school in Ireland.

There is an ongoing debate in the literature about the impact of ICT in education. Findings from this research found positive benefits to their introduction, once they began to be used effectively. The importance of the teacher in their effective use was highlighted. This research disagrees with Mitra who argued that teachers could be replaced by technology. The findings of this research showed that the students don't have the ability to teach themselves with technology. They do not automatically possess good research skills. They struggle to find reliable, relevant sources online and to understand issues of copyright. They also need guidance to deal with the distractions of the digital age. The findings of this research reaffirm the literature review description of the characteristics of those who have grown up in a digital age (Prensky 2012, 2001, Carr 2010, Tapscott 2008, Oblinger and Oblinger 2005). Student feedback correlated with the literature as they highlighted their use and appreciation of images, video, sound and music in the *Wonderlands* curriculum.

In the unique subject area of RE, where a question may not have one right answer the teacher's role is essential in guiding students towards the knowledge, skills, understanding and attitudes at the heart of the subject. No technology can replace this. However, this research has shown that "technology in the hands of great teachers can be transformational" (Couros 2014). This research has advanced the theoretical and practical knowledge on the use of ICT in RE, making original contributions to how the two can be integrated. There was a definitive positive impact on student motivation and engagement evident in this research in line with the findings of Clarke and Svanaes (2012). Student work illustrated this and provided evidence of the collaboration and content creation that occurred and the transformation in teaching and learning that took place. The insights and recommendations from this research as well as the challenges encountered provide a roadmap for others carrying out similar research.

6.5 Final Thoughts

Bennett and Rolheiser suggest that in the hands of a creative teacher almost everything works. They conclude that this is not about the creative teacher having the best idea but because of the integration of ideas or 'synergy' that the teacher applies (2001, p15). While the iPad is a fantastic tool that can be used in education, it's still only a tool in the hands of the teacher. This research has been about the importance of integration; the integration of technology, pedagogy and content; the integration of ideas sparked from discussions with my students, colleagues, peers and supervisors; the integration of my values into my work. As the quote at the start of this chapter says:

> Begin at the beginning…and go on till you come to the end: then stop.
> Lewis Carroll, Alice in Wonderland

For the exploration of my values at the start of this research I found myself revisiting memories and significant moments throughout my life that makes it hard to pinpoint exactly when and where this research truly began. It is even harder to know where to end. In a way there is no end to action research. So this is simply a new beginning. From here I will go forth to teach from an integrated curriculum, to be the 'meddler in the middle' of my classes and to foster environments where courage, creativity and collaboration with others abound.

Bibliography

Anderson, J. 2010. *ICT transforming education: a regional guide*. Bangkok: UNESCO. [Online]. Available from: http://unesdoc.unesco.org/images/0018/001892/189216e.pdf [Accessed 14 July 2015].

Anderson, L.W. and Krathwohl, D.R. (eds.) 2001 *A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives* (Complete edition). New York: Longman.

Baran, E., Chuang, H. and Thompson A.D. 2011. TPACK: an emerging research and development tool for teacher educators. *The Turkish Online Journal of Educational Technology*. 10 (4) pp. 370-377

Benedict XVI. 2011. *Social Networks: portals of truth and faith; new spaces for evangelization.* [Online]. Available from: http://www.vatican.va/holy_father/benedict_xvi/messages/communications/documents/hf_ben-xvi_mes_20130124_47th-world-communications-day_en.html [Accessed 25 May 2017].

Bennett, S. and Mahon, K. 2010. Beyond the digital natives debate: towards a more nuanced understanding of students' technology experiences. *Journal of Computer Assisted Learning,* 26(5), pp. 321-331.

Bennett, B. and Rolheiser, C. 2001. *Beyond Monet: The artful science of instructional integration*. Toronto: Bookation Inc.

Bergmann, J. and Sams, A. 2012. *Flip your classroom: reach every student in every class every day*. USA: International Society for Technology in Education.

Bertrand, Y. 2003. *Contemporary theories and practice in education* 2nd ed. Madison, Wis.: Atwood Publishing.

Biggs, J. 1999. *Teaching for quality learning at university*. Buckingham: Open University Press.

Bloom, B. 1956. *Taxonomy of educational objectives: the classification of educational goals*. New York: Longmans, Green.

Blurton, C. 1999. *New directions of ICT-use in education*. [Online]. Available from: http://www.unesco.org/education/lwf/dl/edict.pdf. [Accessed 04 August 2016].

Bonk, C.J. and Cunningham, D.J. 1998. Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. *IN:* Bonk, C.J. and King, K. S. (eds.) *Learner-centered technologies for literacy, apprenticeship, and discourse*. NJ: Lawrence Erlbaum Associates Publishers, pp. 25-50.

Bradbury, H. 2015. *The sage handbook of action research*. 3rd ed. Los Angeles: Sage Publications.

Brown, B. 2017. *Braving the wilderness: the quest for true belonging and the courage to stand alone.* New York: Random House.

Brown, B. 2015. *Rising strong: the reckoning, the rumble, the revolution*. New York: Spiegel and Grau

Brown, B. 2013. *Daring greatly: how the courage to be vulnerable transforms the way we live, love*, *parent and lead*. New York: Penguins Books.

Brown, M. 2015. Looking over the horizon: new learning platforms, old technology debates. *IN: Education matters yearbook* 2015-2016

Brown, M. 2005. Learning spaces. *IN:* D. Oblinger and J. Oblinger (eds.) *Educating the net generation* (pp. 12.1–12.22). Boulder, CO: EDUCAUSE. [Online]. Available from: http://www.educause.edu/educatingthenetgen [Accessed 06 June 2017].

Bruner, J. 1966. *Towards a theory of instruction.* 2nd ed. Cambridge, Mass: Harvard University Press.

Burvall, A. 2014. A fine time for rhyme (aka the SAMR remix)**.** *AmusED.* [Online], 18 November. Available from: https://amysmooc.wordpress.com/2014/ 11/18/a-fine-time-for-rhyme-aka-the-samr-remix/ [Accessed 04 August 2016].

Butler, D., Leahy, M., Shiel, G. and Cosgrave, J. 2013. A consultative paper building towards a learning society: a national digital strategy for schools. [Online]. Available from: http://www.education.ie/en/Schools-Colleges/ Information/Information-Communications-Technology-ICT-in-Schools/Digital-Strategy-for-Schools/Building-Towards-a-Learning-Society-A-National-Digital-Strategy-for-Schools-Consultative-Paper.pdf [Accessed 08 August 2016].

Butler, T. 2015. *ICT in education: fundamental problems and practical recommendations.* [Online]. Available from: http://afis.ucc.ie/tbutler/ ICT%20in%20Education%20Working%20Paper.pdf [Accessed 14 October 2015].

Byrne, G. 2017. Religious education in Catholic second level schools in Ireland today. *IN*: Shanahan, M. (ed.) *Does religious education matter?* New York: Routledge pp. 114-129.

Byrne, G. 2013. Encouraging and engaging with religion and belief: the contemporary contribution of religious education in schools. *IN:* Byrne, G. and Kieran, P. (eds.) *Toward mutual ground: pluralism, religious education and diversity in Irish schools*. Dublin: The Columba Press pp. 207-224.

Byrne, G. 2005. Religious education renewed: an overview of developments in post-primary religious education. Dublin: Veritas.

Byrne, G. 2004. Embracing life at its fullest: the spirituality of religious educators and school chaplains. *IN:* Norman, J. (ed.) *At the heart of education: school chaplaincy and pastoral care*. Dublin: Veritas Publications, pp. 184-196.

Cahill, C. 2016. *The 1916 Easter Rising*. Available from: https://itunes.apple.com/ie/book/the-1916-easter-rising/id1092294447?mt=11 [Accessed 18 April 2016].

Carr, N. 2010. *The shallows, how the internet is changing the way we read, think and remember.* New York: W.W. Norton and Company.

Carr, W. and Kemmis S. 1986. *Becoming critical: education, knowledge and action research.* London: The Falmer Press.

Carrington, A. 2015. The padagogy wheel V4.0…the next generation. *Designing Outcomes*. [Online], 07 March. Available from: http://designingoutcomes.com/allansportfolio/edublog/?p=1525 [Accessed 12 July 2015].

Carroll, L. 1865. *Alice in Wonderland.* London: Macmillan

Churches, A. 2008. Bloom's digital taxonomy. *Educational Origami.* [Online]. Available from: https://edorigami.wikispaces.com/Bloom%27s+Digital+Taxonomy [Accessed 06 August, 2016].

Clarke, B. and Svanaes, S. 2012. *One-to-one tablets in secondary schools: an evaluation study - stage 1: 2011- 2012*. London: Family Kids and Youth.

Cohen, L., Manion, L. and Morrison, K. 2011. *Research methods in education*. 7th ed. London: Routledge.

Congregation for the Clergy. 1998. General directory for catechesis. Washington, DC: United States Catholic Conference.

Corey, S.M. 1953. *Action research to improve school practices*. New York: Teachers College Press.

Corkery, D. 2017. Lessons for religious educators from the 'good teacher'. *IN*: Shanahan, M. (ed.) *Does religious education matter?* New York: Routledge pp. 247-257.

Couros, G. 2014. We need to see beyond the 'tool'. *The Principle of Change: Stories of Learning and Leading*. [Online] 30 September. Available from: https://georgecouros.ca/blog/archives/4803 {Accessed 26 September 2016].

Creswell, J. 2012. *Educational research: planning, conduction and evaluating quantitative and qualitative research.* London: Person.

Creswell, J., 2009. *Research design: qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications, Inc.

Creswell, J.W. 2007. *Qualitative inquiry and research design: choosing among five traditions.* 2nd ed. Thousand Oaks, CA: Sage Publications.

Crevier, S. 2012. Technology and socks in education. *Bus Ed Crev*. [Online], 13 April. Available from: http://busedcrev.blogspot.ie/search?updated-max=2012-04-18T08:53:00-07:00&max-results=7 [Accessed 14 July 2015].

Crotty, Y. 2016. Educational entrepreneurial approach *DCU Centre for Innovation and Workplace Learning*. [Online]. Available from: https://www.youtube.com/watch?v=vXkWh-7XvN8 [Accessed 8 April 2016].

Crotty, Y. 2014. Promoting a creative educational entrepreneurial approach in higher education. *International Journal for Transformative Research*. 1 (1), pp. 75–100

Crotty, Y. 2012. *How am I bringing an educational entrepreneurial spirit into higher education?* [Online]. Available from: http://yvonnecrotty.com/uploads/Methodology/index.html [Accessed 22 July 2016].

Csikszentmihalyi, M. 2013. *Creativity*: *the psychology of discovery and invention*. 2nd ed. New York: Harper Collins.

Cuban, L. 2015. The lack of evidence based practice: the case of classroom technology (part 1). *Larry Cuban on school reform and classroom practice*. [Online], 5 February. Available from: https://larrycuban.wordpress.com/2015/02/05/the-lack-of-evidence-based-practice-the-case-of-classroom-technology-part-1/ [Accessed 14 July 2015].

Cuban, L. 2002. *Oversold and underused: computers in the classroom*. 2nd ed. Cambridge: Harvard University Press.

Dennen, V.P. and Hao, S. 2014. Intentionally mobile pedagogy: The M-COPE framework for mobile learning in higher education. *Technology, Pedagogy and Education,* 23(3), pp.397-419.

Department of Education and Skills 2016. *School Self-Evaluation Guidelines 2016-2020 Post-Primary*. [Online]. Available from: https://www.education.ie/en/Publications/InspectionReportsPublications/EvaluationReportsGuidelines/School-Self-Evaluation-Guidelines-2016-2020-PostPrimary.pdf [Accessed 03 October 2016].

Department of Education and Skills 2015. *Framework for Junior Cycle* [Online]. Available from: http://www.education.ie/en/Publications/PolicyReports/ Framework-for-Junior-Cycle-2015.pdf [Accessed 20 March 2016].

Department of Education and Skills 2015. Digital strategy for schools 2015-2020: enhancing teaching, learning and assessment. [Online]. Available from: http://www.education.ie/en/Publications/Policy-Reports/Digital-Strategy-for-Schools-2015-2020.pdf [Accessed 08 August 2016].

Department of Education and Skills 2012. *Chief inspector's report 2010-2012*. [Online]. Available from: http://www.education.ie/en/Publications/InspectionReports-Publications/Evaluation-Reports-Guidelines/Chief-Inspector's-Report-2010-2012-Main-Report.pdf [Accessed 15 July 2015].

Department of Education and Skills 2011. *The National Strategy to improve Literacy and Numeracy* [Online]. Available from: https://www.education.ie /en/Publications/ Policy-Reports/lit_num_strategy_full.pdf [Accessed 20 March 2016].

Department of Education and Science, 2008. *Investing effectively in information and communications technology in schools, 2008-2013* [Online]. Available from: http://www.ncte.ie/media/Final%20ICT%20Strategy_group_report.pdf [Accessed 06 June 2013].

Department of Education and Science 2005. *Leaving certificate religious education teacher guidelines*. Dublin: The Stationary Office.

Department of Education and Science, 2003. *Leaving certificate religious education syllabus*. Dublin: The Stationary Office.

Department of Education and Science, 2001. *Junior certificate religious education teacher guidelines*. Dublin: The Stationary Office.

Department of Education and Science, 2000. *Junior certificate religious education syllabus*. Dublin: The Stationary Office.

Denzin, N. K. and Lincoln, Y.S., 2011. *The landscape of qualitative research: theories and issues.* 2nd ed. Thousand Oaks, CA: Sage, pp. 1-37.

Dewey. J. 1956. *The child and the curriculum and the school and society*. London: University of Chicago Press.

Dillon, S. 2013. Religious education at second level in Ireland: inclusive practice. *IN:* Byrne, G. and Kieran, P. (eds.) *Toward mutual ground: pluralism, religious education and diversity in Irish schools*. Dublin: The Columba Press pp. 71-77.

Dilworth, P., Donaldson, A., George, M., Knezek, D., Searson, M., Starkweather, K., Strutchens, M., Tillotson, J. and Robinson, S. 2012. Editorial: preparing teachers for tomorrow's technologies. Contemporary Issues in Technology and Teacher Education, 12 (1), pp. 1-5.

Donlon, E. 2015. *Project 252* [Online]. Available from: http:// project252.donenda.com/index.php [Accessed 09 August 2016].

Donlon, E. 2010. Teachnet.ie. *Online publishing & content management systems podcast.* [Online], 3 December. Available from: http://blog.teachnet.ie/online-publishing-content- management-systems-podcast/ [Accessed 12 of March 2015].

Drake. P. 2009. Grasping at methodological understanding: a cautionary tale from insider research. *International Journal of Research and Method in Education*. 33(1) pp. 85-99.

Drumm, M. 1997. The meaning of pilgrimage. *IN:* Flanagan, D. (ed.) *The meaning of Knock*. Dublin: Columba Press.

Earle, R. S. 2002. The integration of instructional technology into public education: promises and challenges. *ET Magazine*, 42(1) pp. 5-13 [Online]. Available from: http://bookstoread. com/etp/earle.pdf [Accessed 03 July 2017].

Elliott, J. 2004. The struggle to redefine the relationship between 'knowledge' and 'action' in the academy: some reflections on action research. [Online]. Available from: http://www.bath.ac.uk/~edsajw/johnelliott.htm (Accessed 01 April 2015).

Elliott, J. 1991. *Action research for educational change*. Buckingham: Open University Press.

European Commission. *Assessment of Transversal Skills* (ATS2020) [Online]. Available from: http://www.ats2020.eu/ [Accessed 30 June 2017].

Ferriter, W. 2013. Technology is a tool, not a learning outcome. *The Tempered Radical* [Online] 11 July. Available from: http://blog.williamferriter.com/2013/07/11/technology-is-a-tool-not-a-learning-outcome/ [Accessed 05 January 2016].

Finger, G., Jamieson-Proctor, R.G., Cavanagh, R., Albion, P. Bond, T., FitzGerald, R., Romeo, G. and Lloyd, M. 2013. Teaching teachers for the future (TTF) project TPACK survey: summary and key findings. *Australian Educational Computing*. 27(3), pp. 13-25.

Fitzsimons, S. 2012. *An exploration of teaching and learning in a virtual world in the context of higher education*. PhD. Dublin City University.

Francis, 2017. *Communicating hope and trust in our time* [Online]. Available from: https://w2.vatican.va/content/francesco/en/messages/communications/documents/papa-francesco_20170124_messaggio-comunicazioni-sociali.html [Accessed 15 May 2017].

Gardner, H. 1993. *Extraordinary minds: an anatomy of creativity seen through the lives of Freud, Einstein, Picasso, Stravinski, Eliot, Graham and Gandhi*. New York: Basic Books.

Gartland, F. 2015. *Books are better than screens, education conference told. IN:* Irish Times 3 October 2015 [Online] Available from: http://www.irishtimes.com/news/education/books-are-better-than-screens-education-conference-told-1.2377997 [Accessed 09 October 2015].

Grimmitt, M. 1987. *Religious education and human development*. Essex: McCrimmons.

Grimmitt, M. 1983. *Religious education and humanisation.* Sydney: Australian Association for Religious Education.

Grimmitt, M. H. and Read, G.T. 1977. *Teaching Christianity in RE.* Essex: Kevin Mayhew.

Groome, T. 2017. Can we educate for faith? [Online]. Available from: https://www.youtube.com/watch?v=I5lFN-C0bFo&feature=youtu.be [Accessed 13 October 2017].

Groome, T. 2011. *Will there be faith?* Dublin: Veritas Publications.

Groome, T. (ed.) 2011. *Credo series.* [Online]. Available from: http:// www.credoseries.com [Accessed 02 August 2016].

Groome, T. 2005. Shared praxis – a way towards educating for spiritual wisdom. *IN*: Department of Education and Science. *Leaving certificate religious education teacher guidelines.* Dublin: The Stationary Office.

Groome, T. 1999. *Christian religious education*, New York: Harper Collins.

Gunning, T. 2000. Cyberclass: The use of ICT in religious education. *IN:* Galvin, C. (ed.) *Sharing Innovative Practice: The NCTE's Schools Integration Project 1998-2000.* pp. 59-64.

Habermas, J. 1976. *Communication and the evolution of society*. London: Heinemann

Hallissy, M., Gallagher, A., Ryan, S. and Hurley, J. 2014. *The use of tablet devices in ACCS schools* [Online]. Available from: http://www.accs.ie/ content.php?20 [Accessed 28 July 2016].

Hannam, J. and Ashcroft, J. 2015. iPad Apps vs. iPad Pedagogy. *LearnMaker.* [Online], 28 September. Available from: https://elearningfeeds.com/ipad-apps-vs-ipad-pedagogy/ [Accessed 20 June 2016].

Harris, J. and Hofer, M.J. 2011. Technological pedagogical content knowledge (TPACK) in action. *Journal of Research on Technology in Education*, 43 (3), pp. 211-229.

Hartnett, Anderson and Brown 2014. Learning in the digital age: how are the ways in which we are learning changing with digital technologies? *IN:* St. George, A., Brown, S., and O'Neill J. (eds.) *Facing the big questions in teaching: purpose, power and learning* 2nd ed. Melbourne: Cenage, pp. 116-125.

Hendricks. C. 2009. *Improving schools through action research: a comprehensive guide for educators*. New Jersey: Pearson.

Herrington, A., Herrington, J., and Mantei, J. 2009. Design principles for mobile learning. *IN:* Herrington, J., Herrington, A., Mantei, J., Olney, L. and Ferry B. (eds.) *New technologies, new pedagogies: mobile learning in higher education* (pp. 129-138). Wollongong: University of Wollongong. [Online]. Available from: http://ro.uow.edu.au/ [Accessed 07 June 2016].

Hofer, M. and Grandgenett, N. 2012. TPACK development in teacher education: a longitudinal study of preservice teachers in a secondary M.A.Ed. program. *Journal of Research on Technology in Education*, 45 (1), 83-106. [Online]. Available from: http://digitalcommons.unomaha.edu/tedfacpub/34 [Accessed 07 June 2016].

Hofer, M. and Harris J. 2015. Developing TPACK with learning activity types *IN:* Hofer, M, Bell, L. and Bull. G.L (eds.) *The TPACK handbook for practitioners: media rich cases about teacher knowledge*. Waynesboro: AACE (7.1 – 7.14).

Hofer, M. and Harris, J. 2010. Differentiating TPACK development: using learning activity types with inservice and preservice teachers. *IN:* Maddux C. D. Gibson D. and Dodge B. (eds.). *Research highlights in technology and teacher education* VA: Society for Information Technology and Teacher Education. (pp. 295-302).

Hooker, C. 2014. SAMR swimming lessons. *Hooked on Innovation* [Online], 01 August. Available from: https://hookedoninnovation.com/2014/08/01/samr-swimming-lessons/ [Accessed 05 August 2016].

Hooker, C. 2013. Taking a dip in the SAMR swimming pool. *Hooked on Innovation* [Online], 10 December. Available from: https://hookedoninnovation.com/2013/12/10/taking-a-dip-in-the-samr-swimming-pool/ [Accessed 05 August 2016].

Horan, D.P. 2010. Koiononia and the church in the digital age. *Review for Religious,* 69 (Summer Issue), pp. 230-237.

Howe, N. and Strauss, W. 2003. *Millennials go to college: strategies for a new generation on campus.* 2nd ed. Washington DC*: American* Association of Collegiate Registrars.

Howell, W. 2013. Camino de Crestone: the world's first full interfaith pilgrimage. [Online], 30 April. Available from: http://www.huffingtonpost.com/ william-howell/camino-de-crestone-the-worlds-firstfullinterfaithpilgrimage_b_3187096.html [Accessed 19 June 2016].

Hwang, G.-J., and Tsai, C.-C. 2011. Research trends in mobile and ubiquitous learning: a review of publications in selected journals from 2001-2010. *British Journal of Educational Technology, 42*(4), E65-E70.

Irish Catholic Bishops Conference. 2017. *Religious education and the framework for junior cycle.* Dublin: Veritas Publications.

Irish Catholic Bishops Conference. 1999. *Guidelines for the faith formation and development of catholic students.* Dublin: Veritas Publications.

Irish Episcopal Conference. 2010. *Share the good news, national directory for catechesis in Ireland.* Dublin: Veritas Publications.

Jahnke, I and Kumar, S. 2014. Digital didactical designs: teachers' integration of iPads for learning-centered processes. *Journal of Digital Learning in Teacher Education*, 30 (3), pp. 81-88. [Online]. Available from: http://www.tandfonline.com/doi/abs/ 10.1080/21532974.2014.891876 [Accessed 21 March 2016].

Jamieson-Proctor, R.G., Albion, P., Finger, G., Cavanagh, R., FitzGerald, R., Bond, T., and Grimbeek, P. 2013. Development of the TTF TPACK survey instrument. *Australian Educational Computing*. 27(3), pp. 26-35.

Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. 2015. *NMC horizon report: 2015 K-12 edition*. Austin, Texas: The New Media Consortium.

Junior Cycle for Teachers (JCT). 2017. *Assessment of Transversal Skills (ATS2020)* [Online]. Available from: http://ats2020.eu/ireland

Kemmis, S. and McTaggart, R. 2000. Participatory action research. *IN:* Denzin, N. and Lincoln, Y. (eds.) *Handbook of Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage Publications, pp. 567-606.

Kereluik, K., Mishra, P., Fahnoe, C., & Terry, L. 2013. What knowledge is of most worth: teacher knowledge for 21st century learning. *Journal of Digital Learning in Teacher Education*, 29 (4), 127 –140.

Kirk, J. and Miller, M. 1986. *Reliability and validity in qualitative research.* London: Sage.

Koehler, M. J., and Mishra, P. 2009. What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education, 9*(1), pp. 60-70.

Koole, M. 2009. A model for framing mobile learning *IN:* Ally, M. (ed.) *Mobile Learning: Transforming the delivery of education and training.* Edmonton, AB: Athabasca University Press, pp.25-50.

Koshy, V. 2010. *Action research for improving educational practice: a step-by-step guide.* 2nd ed. London: SAGE

Krathwohl, D. R. 2002. A revision of Bloom's taxonomy: an overview, *Theory into Practice*, 41(4), pp. 212-218.

Kulowiec, M. 2013 App smashing part 1. *The History 2.0 Classroom.* [Online], 18 February. Available from: http://kulowiectech.blogspot.ie/2013/02/app-smashing-part-i.html [Accessed 20 June 2015].

Lane, D. A. 2008. *Challenges facing religious education in contemporary Ireland*. Dublin: Veritas Publications.

Lee, D. 2017. *Why is the Vatican at a tech conference?* [Online], 13 March Available from: http://www.bbc.com/news/technology-39252042 [Accessed 18 March 2017].

Le Gallais, T. 2008. Wherever I go there I am: reflections on reflexivity and the research stance. *Reflective Practice*. 9(2), pp. 145-155.

Lewis, G. 2017. *Why Being Vulnerable at Work Can Be Your Biggest Advantage, According to Brené Brown.* [Online]. Available from: https://business.linkedin.com/talent-solutions/blog/talent-connect/2017/why-being-vulnerable-at-work-can-be-your-biggest-advantage-according-to-brene-brown [Accessed 13 October 2017]

Lewin, K. 1948. *Resolving social conflicts; selected papers on group dynamics.* New York: Harper & Row.

Lewin, K. 1946. Action research and minority problems. *Journal of Social Issues*. 2(4), pp. 34-46.

Livingstone, S. 2012 Critical reflections on the benefits of ICT in education, *Oxford Review of Education*, 38(1), pp. 9-24.

Lombardo, T. 2011. *Ethical character development and personal and academic excellence* [Online]. Available from: http://www.centerforfutureconsciousness.com/pdf_files/Readings/EthicalCharDevWrkshp.pdf [Accessed 22 July 2016].

Loreto Education Trust (Ireland) 2016. *Continuing the journey: a Loreto education*. Dublin: Loreto Education Centre,

Mac Mahon, B., Ó Grádaigh, S. and Ní Ghuidhir, S. 2016. ITE: student teachers using iPad on a second level initial teacher education programme. *International Journal of Mobile and Blended Learning.* 8(2). pp. 21-34.

Mcloughlin, C. and Lee, M.J.W. 2008. The three P's of pedagogy for the networked society: personalization, participation, and productivity. *International Journal of Teaching and Learning in Higher Education.* 20(1), pp. 10-27.

McTaggart, R., and Kemmis, S. 1988. *The action research planner* Vic: Deakin University.

McNiff, J. 2002. Action research for professional development. [Online]. Available from: http://www.jeanmcniff.com/ar-booklet.asp [Accessed 06 June 2015].

McNiff, J. and Whitehead, J. 2006. *All you need to know about action research*. London: Sage.

McNiff, J. and Whitehead, J. 2002. *Action research: principles and practice*. 4th ed. London: Routledge.

McNiff, J., Lomax, P. and Whitehead, J. 2003. *You and your action research Project*. London: Routledge.

McWilliam, E. 2012. Personally significant learning. *Erica McWilliam.* [Online], 16 April. Available from: http://www.ericamcwilliam.com.au/ personally-significant-learning/ [Accessed 06 August 2016].

Meehan, A. 2012. *Joining the dots*, Dublin: Veritas Publications.

Meehan, R. J. *250 of the best education quotes of Robert John Meehan* [Online]. Available from: https://sites.google.com/site/robertjohnmeehan/ [Accessed 4 January 2016].

Melhuish, K. and Falloon, G. 2010. 'Looking to the future: m-learning with the iPad'. *Computers in New Zealand Schools: Learning, Leading, Technology*, 22 (3), pp. 1-16. *Schools* [Online]. Available from: http:// researchcommons.waikato.ac.nz/bitstream/handle/10289/5050/Looking%20to%20the%20future.pdf?sequence=1 [Accessed 13 July 2015].

Mercer, J. 2007. The challenges of insider research in educational institutions: wielding a double-edged sword and resolving delicate dilemmas. *Oxford Review of Education*. 33(1) pp. 1-17.

Mills, G.E. 2003. *Action research: a guide for the teacher researcher* 2nd ed. New Jersey: Merrill Prentice Hall.

Mishra, P., Koehler, M., and Henriksen, D. 2010. The 7 transdisciplinary habits of mind: extending the TPACK framework towards 21st century learning. *Educational Technology*, 51 (2), pp. 22–28.

Mishra, P. and Koehler, M.J. 2007. Technological pedagogical content knowledge (TPCK): confronting the wicked problems of teaching with technology. *IN:* C. Crawford, D. A. Willis, R. Carlson, I. Gibson, K. McFerrin, J. Pricer, and R. Weber (eds.) *Proceedings of Society for Information Technology and Teacher Education International Conference 2007* pp. 2214-2226. Chesapeake, VA: AACE

Mishra, P. and Koehler, M.J. 2006. Technological pedagogical content knowledge: a framework for teacher knowledge. *Teachers College Record*, 108, pp. 1017-1054.

Mishra, P. and Mehta, R. 2016. What we educators get wrong about 21st-century learning: results of a survey. *Journal of Digital Learning in Teacher Education*, 33(1) pp. 6-19.

Mitra, S. 2013 *Build a school in the cloud*. [Online] Available from: https://www.ted.com/talks/sugata_mitra_build_a_school_in_the_cloud [Accessed 20 June 2017]

Mitra, S. 2007. *Kids can teach themselves.* [Online] Available from: https://www.ted.com/talks/sugata_mitra_shows_how_kids_teach_themselves [Accessed 20 June 2017]

Morrison-Reilly, C. 2016. *An exploration of smartphone microblogging supporting the device, learner and social aspects of learning within post primary religious education*. EdD. Dublin City University.

National Council for Curriculum and Assessment (NCCA) 2013. *Digital media literacy draft specification for junior cycle short course*. [Online]. Available from: www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/Consultation/Short%20Courses/SC_DML.pdf [Accessed 15 July 2015].

National Council for Curriculum and Assessment (NCCA) 2005. A curriculum framework for senior cycle. *IN:* DES 2005. *Leaving certificate religious education teacher guidelines*. Dublin: The Stationary Office.

Newby, P. 2010. *Research methods for education.* New York: Pearson Education.

Oblinger, D. and Oblinger, J. 2005. Is it age or IT: first steps towards understanding the net generation. *IN:* D. Oblinger and J. Oblinger (eds.) *Educating the net generation* Boulder, CO: EDUCAUSE. pp. 2.1–2.20. [Online]. Available from: http://www.educause.edu/educatingthenetgen [Accessed 06 June 2017].

OECD 2015. *Students, computers and learning: making the connection*. Paris: OECD Publishing. [Online]. Available from: http://dx.doi.org/10.1787/9789264239555-en [Accessed 08 August 2016].

Ó Grádaigh, S. 2016. *Scéal 1916*. Available from: https://itunes.apple.com/ie/book/sceal-1916/id1105475557?mt=13 [Accessed 18 April 2016].

Olofson, M.W., Swallow, M.J.C., and Neumann, M.D. 2016. TPACKing: a constructivist framing of TPACK to analyze teachers' construction of knowledge. *Computers &Education*, 95, pp. 188-201

Oppenheimer, T. 2003. *The flickering mind: false promise of technology in the classroom and how learning can be saved*. Toronto: Random House.

Palmer, P.J. 2007. *The courage to teach.* 2nd ed. San Francisco: Jossey-Bass.

Palmer, P.J. 1993. *To know as we are known: a spirituality of education*. San Francisco: Harper Collins

Papert, S. 1987. *A critique of technocentrism in thinking about the school of the future* [Online]. Available from http://www.papert.org/articles/ACritiqueoflechnocentrism.html [Accessed 02 July 2017].

Partnership for 21st century learning (P21) [Online]. Available from: http://www.p21.org/index.php [Accessed 18 June 2017].

Pontifical Council for Social Communications. 2002. *The Church and the internet*. [Online]. Available from: http://www.vatican.va/roman_curia/pontifical_councils/pccs/documents/rc_pc_pccs_doc_20020228_church-internet_en.html [Accessed 29 August 2017].

Pontifical Council for Social Communications. 1992. *Aetatis novae* (Dawning of a new era). [Online]. Available from: http://www.vatican.va/roman_curia/pontifical_councils/pccs/documents/rc_pc_pccs_doc_22021992_aetatis_en.html [Accessed 29 August 2017].

Powers, W. 2010. *Hamlet's blackberry: a practical philosophy for building a good life in the digital age.* New York: Harper Collins.

Prensky, M., R. 2012. *From digital natives to digital wisdom: hopeful essays for 21st century learning.* Thousand Oaks: Sage.

Prensky, M., R. 2001a. Digital natives, digital immigrants. *On the Horizon* 9(5), pp. 1-6. [Online]. Available from: http://www.emeraldinsight.com/doi/abs/10.1108/10748120110424816 [Accessed 06 June 2017].

Prensky, M., R. 2001b. Digital natives, digital immigrants, part II: do they really think differently? *On the Horizon* 9(6), pp. 1-6 [Online]. Available from: http://www.emeraldinsight.com/doi/abs/10.1108/10748120110424843 [Accessed 06 June 2017].

Protalinski, E. 2016. *Facebook passes 1.65 billion monthly active users, 54% access the service only on mobile.* [Online]. Available from: http://venturebeat.com/2016/04/27/facebook-passes-1-65-billion-monthly-active-users-54-access-the-service-only-on-mobile/ [Accessed 01 August 2017].

Puentedura, R. 2009. As we may teach: educational technology, from theory into practice. [Online]. Available from: http://tinyurl.com/aswemayteach [Accessed 16 June 2017].

Puentedura, R. 2006. Transformation, technology, and education, [Online]. Available from: http://hippasus.com/resources/tte/puentedura_tte.pdf [Accessed 16 June 2016].

Pegrum, M., Oakley, G., and Faulkner, R. 2013. Schools going mobile: a study of the adoption of mobile and held technologies in Western Australian independent schools. *Australasian Journal of Educational Technology,* 29(1), pp. 66-81.

Robinson, K. 2011. Out of our minds: learning to be creative. 2nd ed. Chichester: Capstone Publishing.

Robinson, K. 2010. Bring on the learning revolution! [Online]. Available from: http://www.ted.com/talks/sir_ken_robinson_bring_on_the_revolution [Accessed 28 October 2015].

Robinson, K. 2006. Do schools kill creativity? [Online]. Available from: http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity [Accessed 28 October 2015].

Robson, C. 2011. *Real world research: a resource for users of social research methods in applied settings.* 3rd ed. West Sussex: Wiley.

Roland, D. and Wicks, D. 2009. *Qualitative research in the new century: map points in insider researcher.* Kent, OH: School of Library and Information Science, Kent State University.

Rosenberg, M. J. 2001. *E-learning: strategies for delivering knowledge in the digital age.* New York: McGraw-Hill.

Sauers, N. J. and McLeod, S. 2011. *What does the research say about school one-to-one computing initiatives?* [Online]. Available from: http://www.natickps.org/CASTLEBrief01_LaptopPrograms.pdf [Accessed 14 July 2017].

Schön, D. 1983. *The reflective practitioner: how professionals think in action*. New York: Basic Books.

Schrum, L., Thompson, A., Maddux, C., Sprague, D., Bull, G., and Bell, L. 2007. Editorial: Research on the effectiveness of technology in schools: the roles of pedagogy and content. *Contemporary Issues in Technology and Teacher Education* 7(10), pp. 456-460. [Online]. Available from: http:// www.citejournal.org/ wp-content/uploads/2016/04/v7i1editorial1.pdf [Accessed 12 July 2017].

Selwyn, N. 2016. Minding our language: why education and technology is full of bullshit ... and what might be done about it. *Learning, Media and Technology* 41(3), pp. 437-443.

Selwyn, N. 2015. Technology and education - why it's crucial to be critical. *IN:* Bulfin, S., Johnson, N. and Bigum, C. (eds.) *Critical perspectives on technology and education*. New York: Palgrave Macmillan, pp. 245-256.

Selwyn, N. 2011. *Schools and schooling in a digital age: a critical analysis*. Abingdon: Routledge.

Shulman, L. S. 1986. Those who understand: knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.

Smith, M. K. 2001. Kurt Lewin, groups, experiential learning and action research. [Online]. Available from: *The encyclopaedia of informal education*, http://www.infed.org/thinkers/ et-lewin.htm [Accessed 26 June 2017].

Smith, Z. 2010. *Generation why?* [Online]. Available from: http:// www.nybooks.com/articles/archives/2010/nov/25/generationwhy/?pagination=false [Accessed 13 May 2017].

Sousa, A. 2011. *How the brain learns*. Thousand Oaks: Sage.

Strauss, A. and Corbin, J. 1998. *Basics of qualitative research: techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage publications.

Stenhouse, L. 1975. *An introduction to curriculum research and development*. London: Heinemann.

Stinson, L. 2015. In this classroom, knowledge is overrated. *Wired*. [Online 27 October]. Available from: http://www.wired.com.dcu.idm.oclc.org/2015/10/in-this-classroom-knowledge-is-overrated [Accessed 20 June 2017].

Stringer, E. 2004. *Action research in education.* New Jersey: Pearson Education, Inc.

Sullivan, J. 2017. A space like no other. *IN*: Shanahan, M. (ed.) *Does religious education matter?* New York: Routledge pp. 247-257.

Tapscott, D. 2009. *Grown up digital.* New York: McGraw-Hill.

Tapscott, D. 2008. *How to teach and manage 'generation net'* [Online]. Available from: http://www.businessweek.com/stories/2008-11-30/how-to-teach-and-manage-generation-netbusinessweek-business-news-stock-market-and-financial-advice [Accessed 10 May 2017].

Tapscott, D. 1998. Growing up digital: the rise of the net generation. New York: McGraw-Hill.

Thompson, A. and Mishra, P. 2008. Breaking news: TPCK becomes TPACK! *Journal of Computing in Teacher Education*, 24(2), pp. 38-64.

Thompson, A. and Schmidt, D. 2010. Second-generation TPACK: emphasis on research and practice. *Journal of Digital Learning in Teacher Education*, 26(4), pp. 125 (1).

Torevell, D. 2017. Living the questions: the spirituality of the RE tecaher according to Henri J.M. Nouwen. *IN*: Shanahan, M. (ed.) *Does religious education matter?* New York: Routledge pp. 65-75.

Travers, A. 2015. *Oxygen for the soul: prayers, reflections and inspiration for teenagers.* Dublin: Veritas Publications.

Travers, A. 2009. *FaithConnect: recording, analysing and evaluating an innovative approach to religious education through ICT.* M.A. thesis. Mater Dei Institute of Education.

Traxler, J. 2010. Will student devices deliver innovation, inclusion and transformation? *Journal of the Research Centre for Educational Technologies*, 6 (1), pp. 3–15.

Turkle, S. 2011. *Alone together: why we expect more from technology and less from each other.* New York: Basic Books.

UNESCO 2011. *UNESCO ICT competency framework for teachers version 2.0*. [Online]. Available from: http://unesdoc.unesco.org/images/0021/002134/213475E.pdf. [Accessed 28 March 2017].

Vatican II 1965. *Gravissimum educationis.* [Online]. Available from: http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_decl_19651028_gravissimum-educationis_en.html [Accessed 29 August 2017].

Vygotskii, L. S. 1978. *Mind in society: the development of higher psychological processes*. Cambridge: Harvard University Press.

Walsh, O. and Donlon, E. 2010 *FaithConnect*. [Online]. Available from: http:// www.faithconnect.ie [Accessed 02 August 2017].

Ward, M. *Mary Ward resources document library* [Online]. Available from: http://www.marywarddocuments.org/ [Accessed 20 June 2017].

Watson, B. 2012. Why religious education matters. *IN:* Barnes, L. P. *Debates in religious education.* New York: Routledge, pp. 13-21.

Whitehead, J. 2008. Using a living theory methodology in improving practice and generating educational knowledge in living theories. *Educational Journal of Living Theories.* 1(1), pp. 103-126.

Whitehead, J. and McNiff, J. 2006. *Action research living theory*. London: Sage.

Wickins, E. and Crossley, M. 2016. Coming alongside in the co-construction of professional knowledge: a fluid approach to researcher positioning on the insider-outsider continuum. *IN:* Crossley, M., Arthur, L. and McNess, E. *Revisiting insider-outsider research in comparative and international education*. Southampton. Symposium books, pp. 225-240.

Williams, D. 2013. Assessment: the bridge between teaching and learning. *Voices from the Middle*. 21 (2).

Winter, R. 1996. Some principles and procedures for the conduct of action research. *IN:* Zuber-Skerrit, O. 1996. (ed.). *New directions in action research.* London: Falmer Press. 13-27.

Winter, R. 1989. *Learning from experience: principles and practices in action research*. London: Falmer Press Ltd.

Wright, S. 2012. Flipping Bloom's taxonomy. *Wright's Room.* [Online], 29 May. Available from: https://shelleywright.wordpress.com/2012/05/29/flipping-blooms-taxonomy/ [Accessed 28 March 2017].

Zuber-Skerrit, O. 1996. (ed.). *New directions in action research*. London: Falmer.

Zukowski, A.A. 2013. We never did it that way before! *Catechetical Leader,* 24(1), pp. 12-15.

Zukowski, A.A. 2010. How will Catholic education respond to digital cultural issues and questions? *Momentum, (Official Journal of NCE),* (3), pp. 76-77.

Appendices

Appendix A: Key skills and their elements outlined in the Junior Cycle

Source: Framework for Junior Cycle, (DES 2015), Figure 2, p.13.

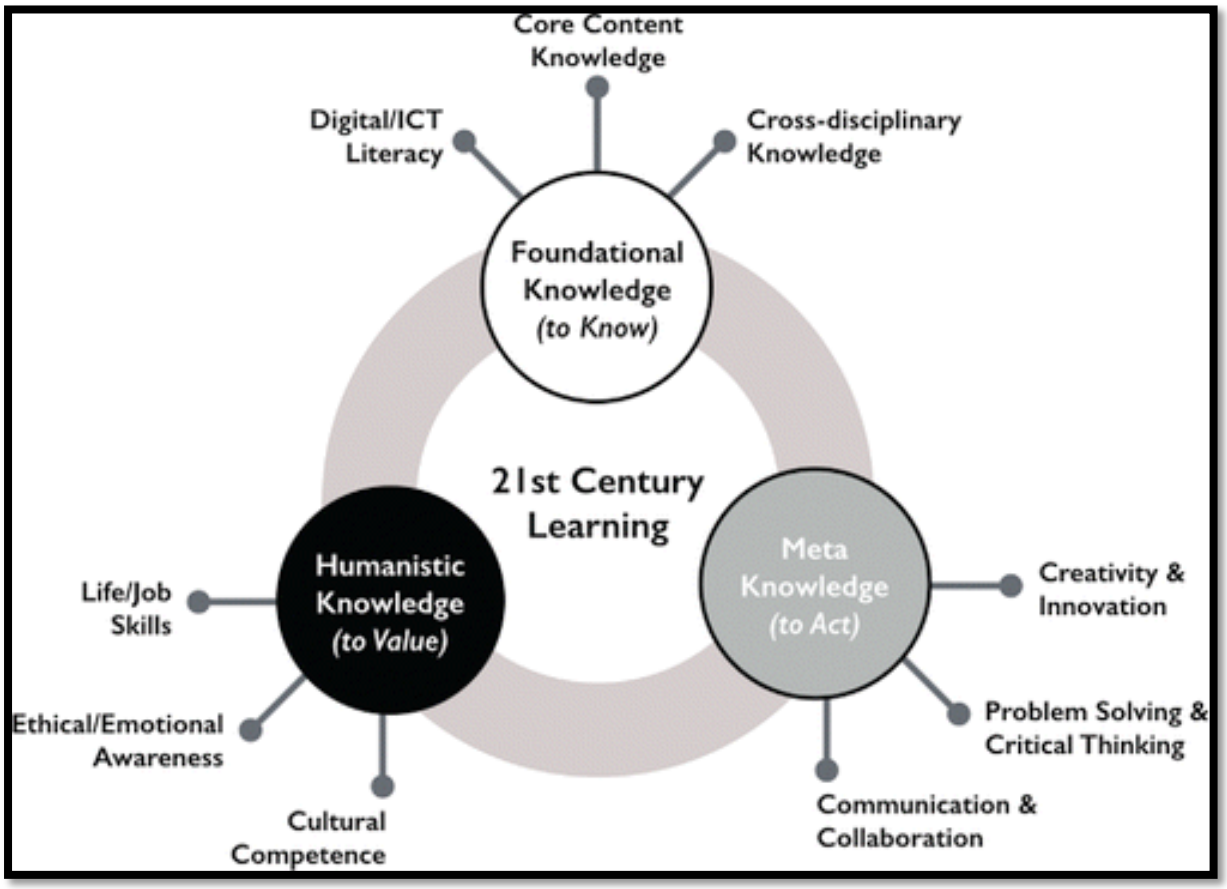
Appendix B: Skills in Junior Certificate RE Journal Work

Source: JCRE Teacher Guidelines (DES, 2001 p. 75)

Skills	Examples of development
Enquiry skills	Enquiring about items, products, people, organisations and aspects of the environment
Observational skills	Students are encouraged to observe, interpret, express and record what they see
Problem-solving skills	Students undertake tasks or activities in which they identify the essential requirements or constraints and decide on appropriate solutions to the problem
Research skills	Students are introduced to and guided in ways of finding, recording, analysing and using appropriate research material
Reflective skills	Students are encouraged to reflect on their findings or observations
Organisational skills	Through organisation of their own time and effort, students are enabled to plan, manage and complete their tasks
Critical evaluation skills	Students are guided in the critical, creative and constructive evaluation of their findings, observations, solutions

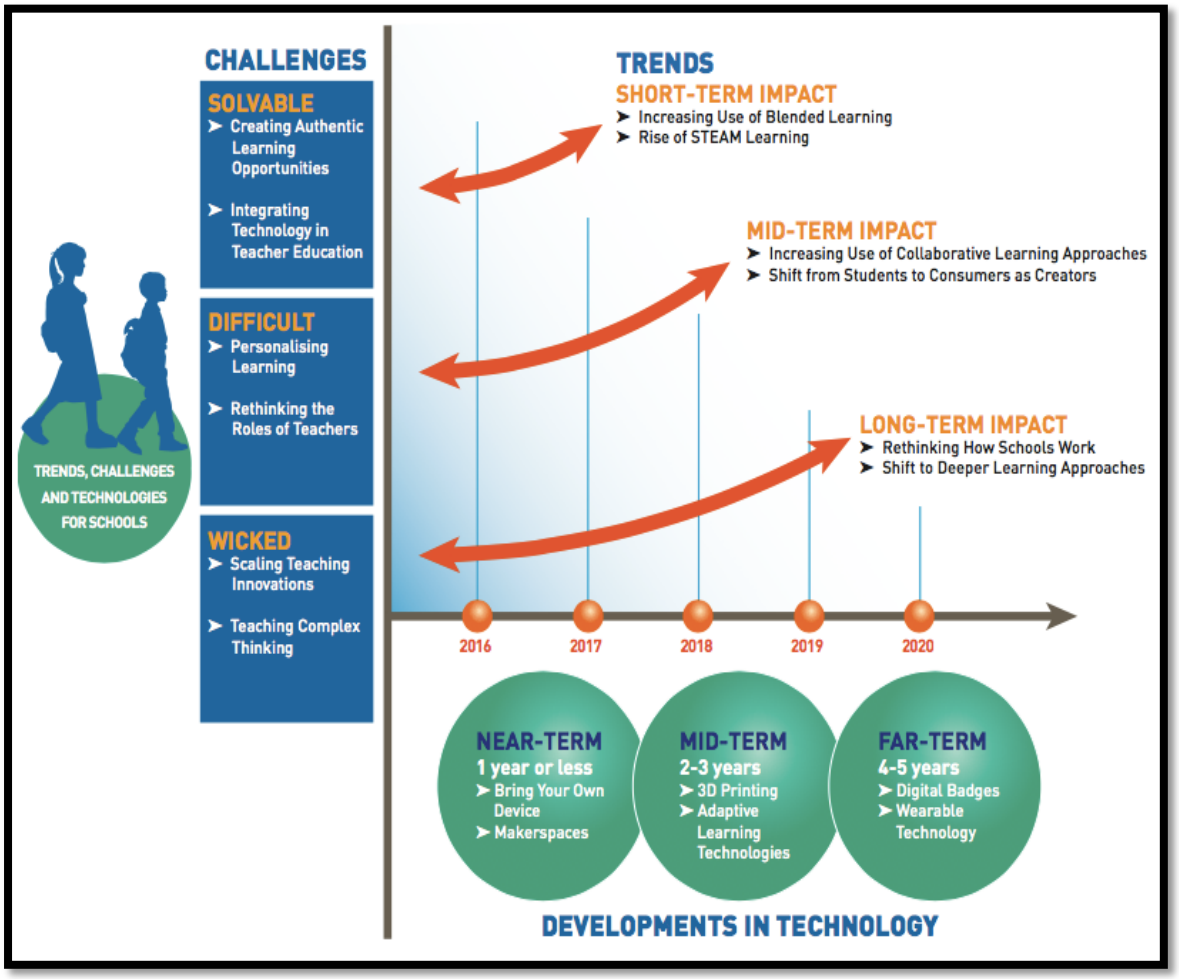
Appendix C: 21st Century Learning Knowledge 'three times three' model

Source: Kereluik, K., Mishra, P., Fahnoe, C., & Terry, L. (2013). What knowledge is of most worth: teacher knowledge for 21st century learning. *Journal of Digital Learning in Teacher Education*, 29 (4), 127 –140.



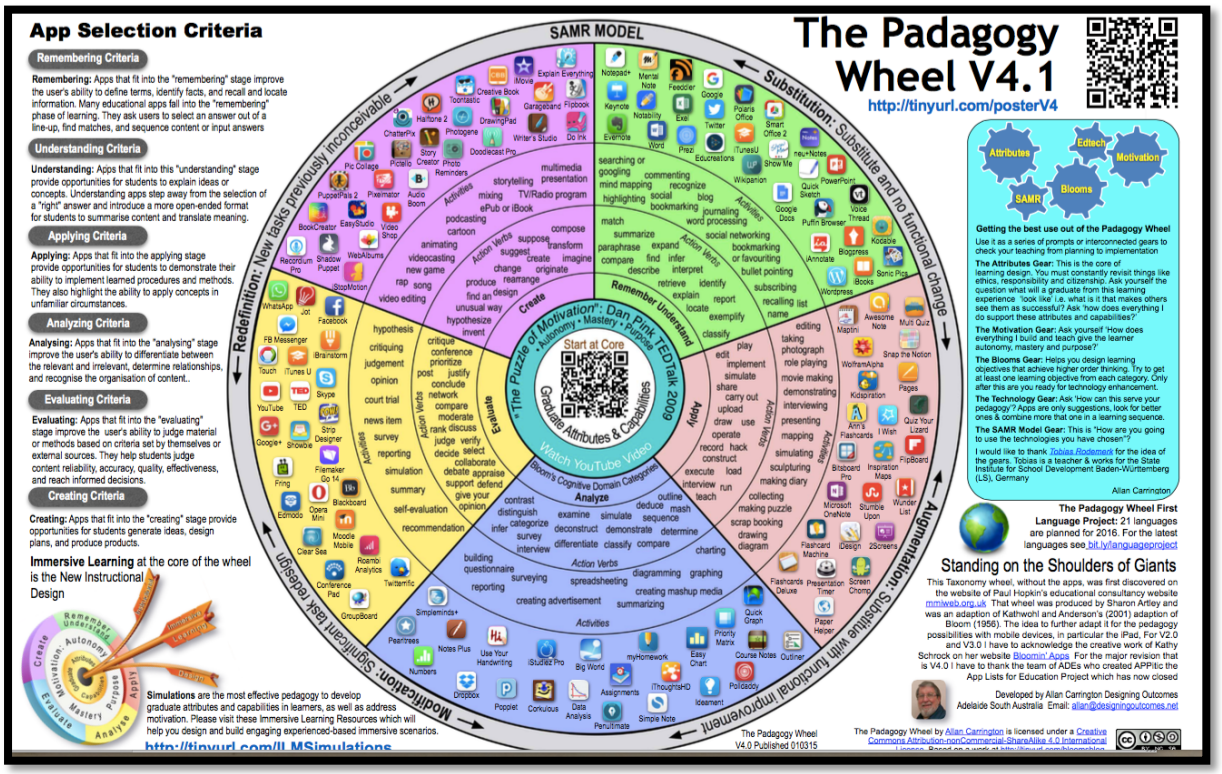
Appendix D: Horizon Report 2015

Source: Johnson et al. 2015

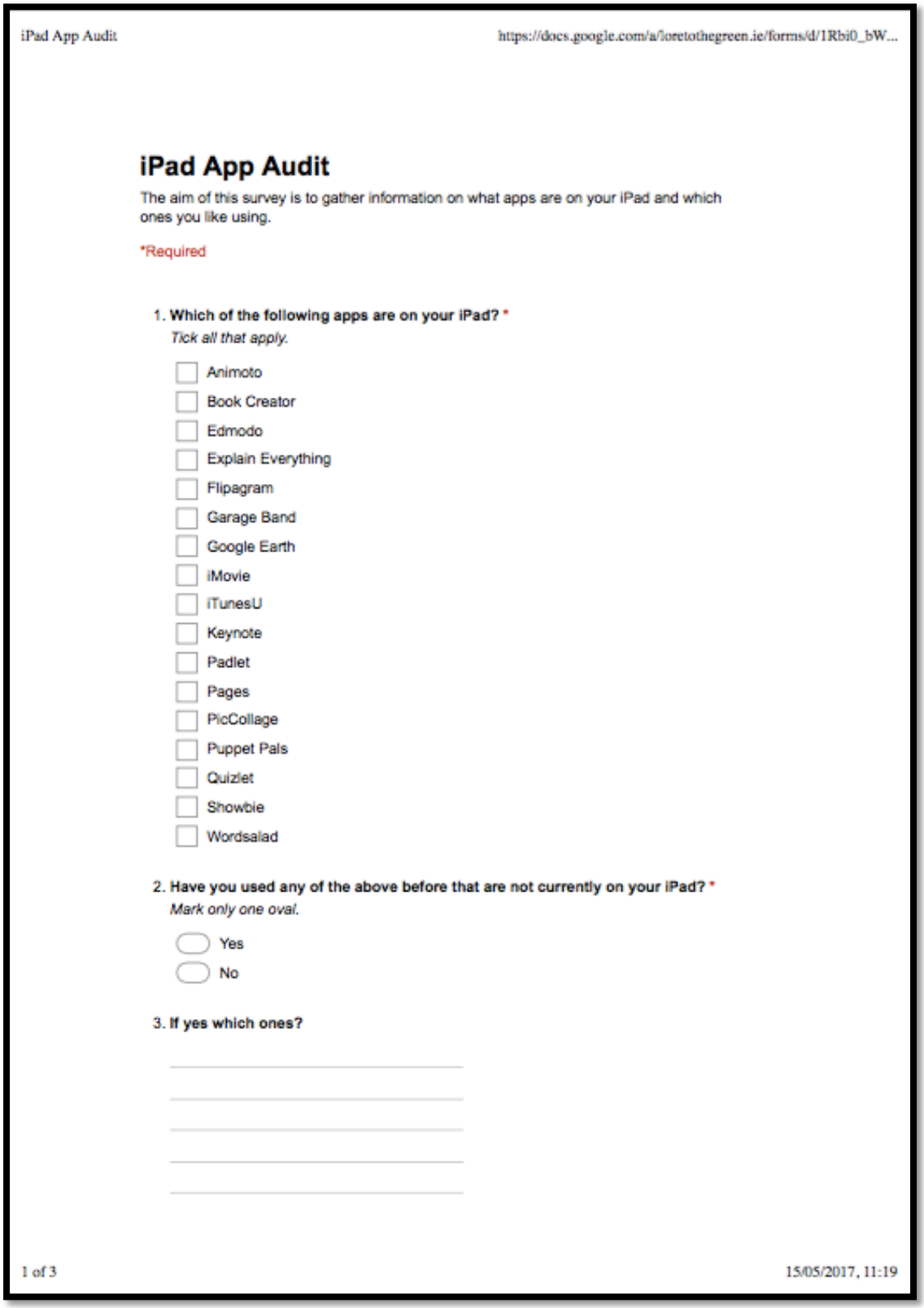


Appendix E: Carrington's 'Padagogy Wheel'

Source: Carrington (2015)



Appendix F: Student iPad app audit survey



iPad App Audit

The aim of this survey is to gather information on what apps are on your iPad and which ones you like using.

*Required

1. **Which of the following apps are on your iPad?** *
   Tick all that apply.
   - [ ] Animoto
   - [ ] Book Creator
   - [ ] Edmodo
   - [ ] Explain Everything
   - [ ] Flipagram
   - [ ] Garage Band
   - [ ] Google Earth
   - [ ] iMovie
   - [ ] iTunesU
   - [ ] Keynote
   - [ ] Padlet
   - [ ] Pages
   - [ ] PicCollage
   - [ ] Puppet Pals
   - [ ] Quizlet
   - [ ] Showbie
   - [ ] Wordsalad

2. **Have you used any of the above before that are not currently on your iPad?** *
   Mark only one oval.
   - ( ) Yes
   - ( ) No

3. **If yes which ones?**

4. **How confident are you using the apps on your iPad?** *
Mark only one oval.

	1	2	3	4	5	
Not confidant	◯	◯	◯	◯	◯	Very confidant

5. **Can you suggest any other apps or websites that could be useful in RE?**

6. **What are your top 3 favourite apps or websites that you use for school work?** *

7. **What are your top 3 apps or websites that you use in your free time? (including social media apps).** *

8. **What social media accounts do you have?** *
Tick all that apply.

- [ ] Facebook
- [ ] Twitter
- [ ] Snapchat
- [ ] Vimeo
- [ ] Youtube
- [ ] Vine
- [ ] Instagram
- [ ] Pinterest
- [ ] Ask.fm
- [ ] Other: _____

9. **What do you like about having an iPad for school?** *

10. **What do you not like about having an iPad for school?** *

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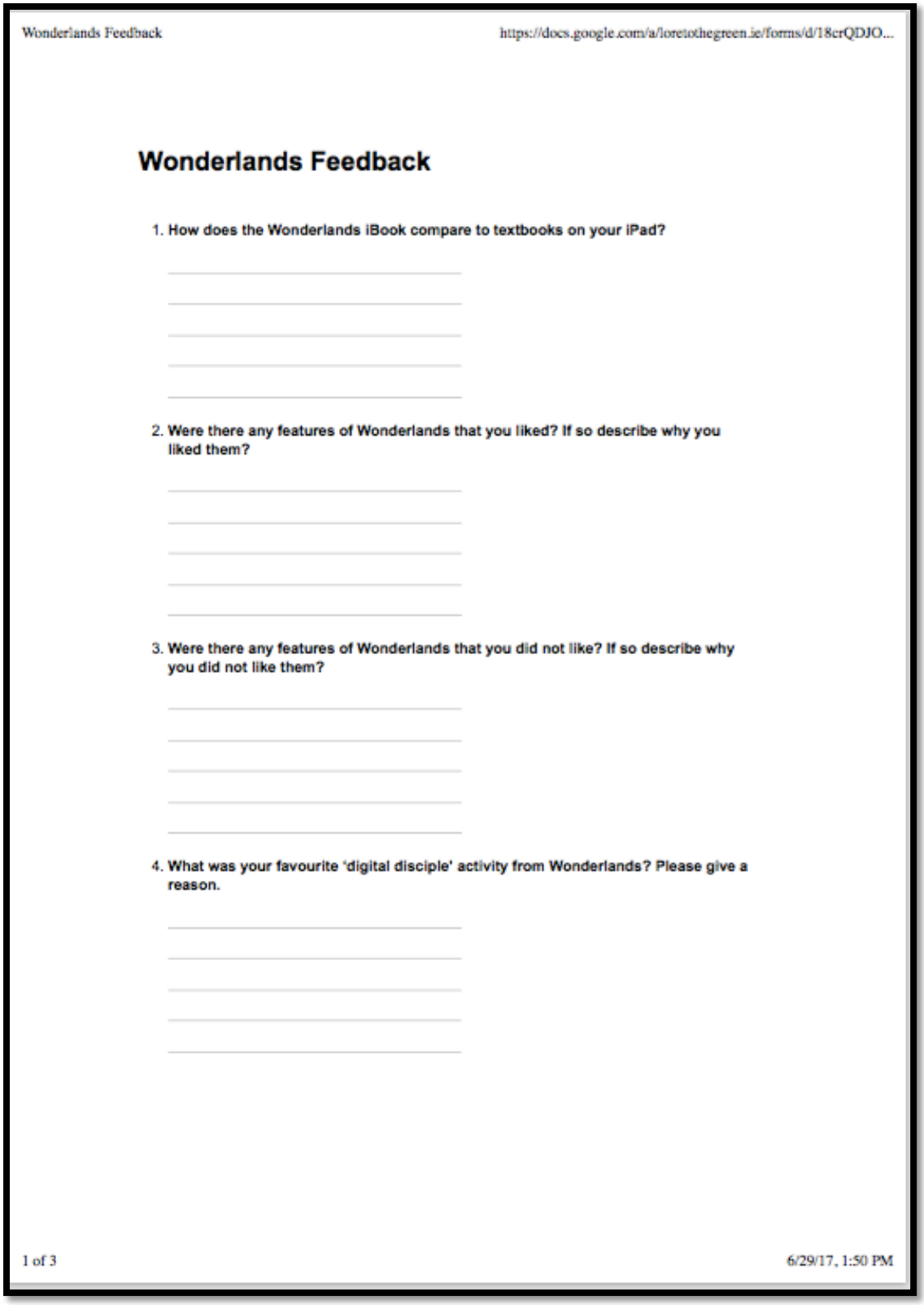
Appendix G: Student Wonderlands feedback survey



Wonderlands Feedback

1. How does the Wonderlands iBook compare to textbooks on your iPad?

2. Were there any features of Wonderlands that you liked? If so describe why you liked them?

3. Were there any features of Wonderlands that you did not like? If so describe why you did not like them?

4. What was your favourite 'digital disciple' activity from Wonderlands? Please give a reason.

5. **Do you have any suggestions to improve Wonderlands for next year?**

Making your iBook

This section is about the iBook you made

6. **Did you make your iBook on your own or as part of a group**

Mark only one oval.

- ◯ On my own
- ◯ As part of a group

7. **Was the Book Creator app easy to use?**

Mark only one oval.

	1	2	3	4	5	
Very easy	◯	◯	◯	◯	◯	Very hard

8. **How would you rate the book creator app?**

Mark only one oval.

	1	2	3	4	5	
Lowest	◯	◯	◯	◯	◯	Highest

9. **What aspect/s of making an iBook did you enjoy?**

10. **What aspect/s of making an iBook did you not enjoy?**

11. What advice would you give to someone making an iBook for the first time?

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Appendix H: Teacher feedback questions

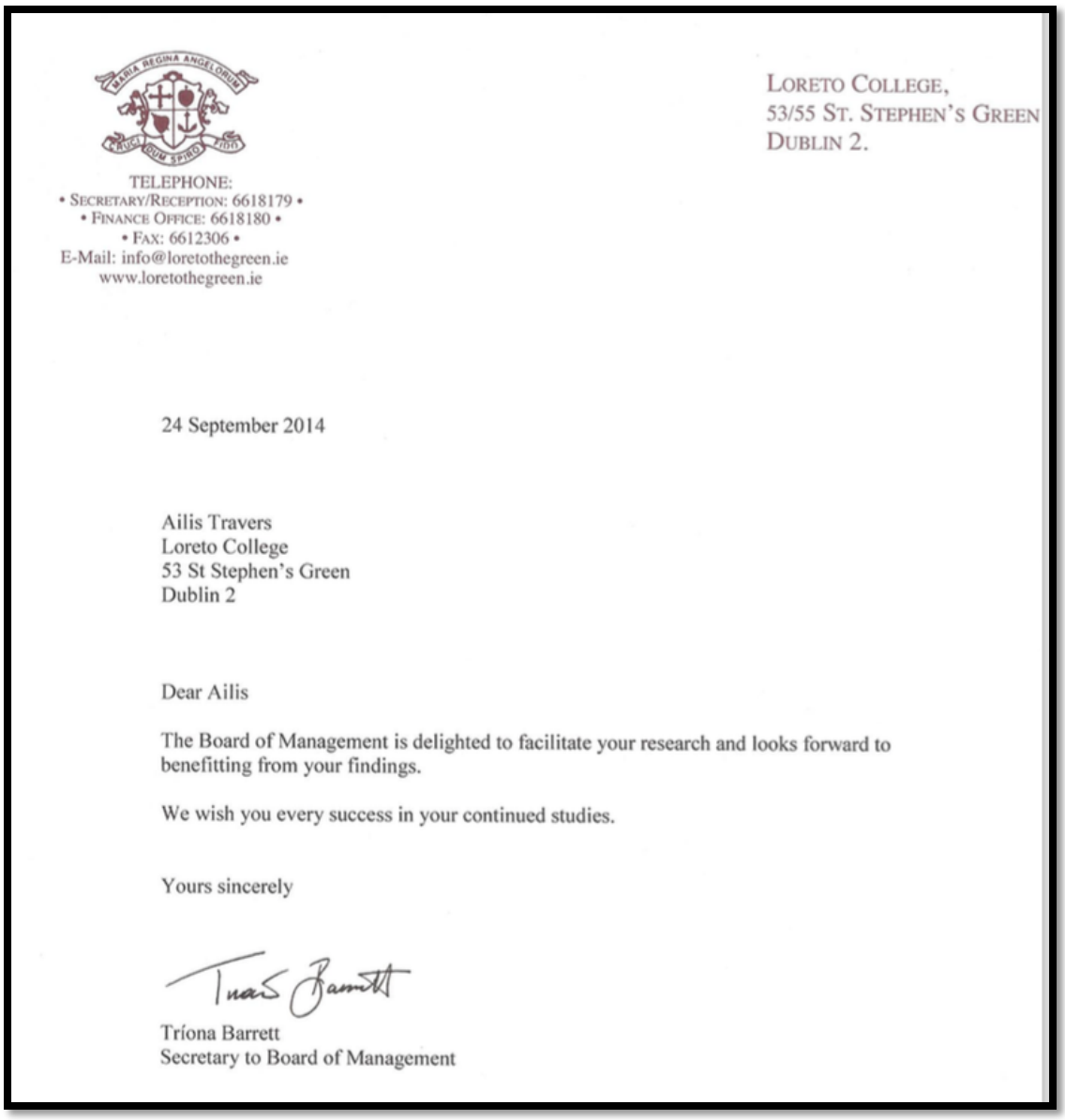
After 'Understand' cycle:

- What factors were barriers to using *Book Creator*?
- What value do you see in student created iBooks (whether you used it or not)?
- Can you make recommendations for future versions of this project?

After 'Create' cycle

- What was your reaction to the *Wonderlands* iBook?
- What was the student reaction to the *Wonderlands* iBook?
- What aspects of the *Wonderlands* iBook are effective for teaching the topic of pilgrimage?
- What aspects of the *Wonderlands* iBook are not effective for teaching the topic of pilgrimage?
- What do you think of the style of the layout and style of the *Wonderlands* iBook?
- What do you think of the digital disciple activities?
- What do you think of the final student project?
- What aspects of the *Wonderlands* iBook would you change to help improve it?

Appendix I: Approval from school Board of Management to carry out research



LORETO COLLEGE,
53/55 ST. STEPHEN'S GREEN
DUBLIN 2.

TELEPHONE:
• SECRETARY/RECEPTION: 6618179 •
• FINANCE OFFICE: 6618180 •
• FAX: 6612306 •
E-Mail: info@loretothegreen.ie
www.loretothegreen.ie

24 September 2014

Ailis Travers
Loreto College
53 St Stephen's Green
Dublin 2

Dear Ailis

The Board of Management is delighted to facilitate your research and looks forward to benefitting from your findings.

We wish you every success in your continued studies.

Yours sincerely

Tríona Barrett
Secretary to Board of Management

Appendix J: Plain language statement and consent form for colleagues

Plain Language Statement

Ed-ventures in Wonderland:

Creating an innovative curriculum for integrating iPads in Religious Education.

The above research study is being conducted by myself, Ms Ailís Travers, Doctoral Student at Dublin City University (DCU) School of Education, under the supervision of Dr. Yvonne Crotty and Dr. Gareth Byrne. This study will form part of my thesis, and has been approved by the Ethics Committee of DCU.

Dear _____

I am carrying out research on the integration of iPads in Religious Education as part of the Professional Doctorate in Education in Dublin City University. I would like to get your feedback on the activities we do with the iPads and I would appreciate your ideas and feedback to help co-create a curriculum for our students. I hope that this research will help us make better use of the iPads in the future.

I will observe good ethical conduct throughout this research. All data produced from this research project will be kept in a secure place. The findings and outcomes of the research will be made available to all stakeholders. Your involvement in this research is completely voluntary and you have the right to withdraw from participating at any stage.

This plain language statement is for you to keep. If you consent to participate in this research project, please indicate that you have read and understood this information by signing the accompanying consent form and returning it to me. Please do not hesitate to get in touch with me if you have any questions.

Please contact me should you have any questions regarding this research.

Yours sincerely,

Ailís Travers
a.travers@loretothegreen.ie

Informed Consent Form
Colleague Copy

Please ensure that you have read the Plain Language Statement and then answer the following -

	Yes	No
I have read the Plain Language statement	☐	☐
I understand the information provided.	☐	☐
I have received satisfactory answers to any questions I have about the project.	☐	☐
I know who to contact if I need to ask any more questions about the research.	☐	☐
I know that I may withdraw from the research project at any stage.	☐	☐

I consent to take part in this research project.

Name in block capitals:
_____

Signature: _____

Appendix K: Plain language statement and consent form for parents and guardians

Ed-ventures in Wonderland:

Creating an innovative curriculum for integrating iPads in Religious Education.

The above research study is being conducted by myself, Ms Ailís Travers, Doctoral Student at Dublin City University (DCU) School of Education, under the supervision of Dr. Yvonne Crotty and Dr. Gareth Byrne. This study will form part of my thesis, and has been approved by the Ethics Committee of DCU.

Plain Language Statement

Dear parents/guardians,

I am carrying out research as part the Professional Doctorate in Education in Dublin City University. The research is investigating my practice in relation to the use of iPads in Religious Education. While I am the focus of my own research, I need student co-operation to facilitate it. I would be grateful if you would give permission for your daughter to take part. I have received permission from the school's Board of Management to conduct this research.

I would like to get student feedback on the activities we do with the iPads and I would like to incorporate samples of student work in my research. This may include some or all of the following: audio, videotaping or photographs of class activities and the work we do. This research will not require any student commitment outside of normal class time. I hope that this research will help us make better use of the iPads in the future.

I will observe good ethical conduct throughout this research. The confidentiality of your daughter's feedback will be protected to the fullest possible extent, within the limits of the law. The school policy in respect of Child Protection will be strictly adhered to. All data produced from this research project will be kept in a secure place. The findings and outcomes of the research will be made available to all stakeholders.

The involvement of your daughter in this research is completely voluntary and you have the right to withdraw your daughter from participating at any stage. Should your daughter decide she wishes to withdraw she may do so at any time. If a student does not wish to take part in the research, she will still complete the class activities as normal but her feedback and work will not be used in the research.

This plain language statement is for you to keep. If you give permission for your daughter to participate in this research project, please indicate that you have read and understood this information by signing the accompanying consent form and returning it to me. Please do not hesitate to get in touch with me if you have any questions.

Please contact me should you have any questions regarding this research.

Yours sincerely,

Ailís Travers
a.travers@loretothegreen.ie

Informed Consent Form
Parent Copy

Please ensure that you have read the Plain Language Statement and then answer the following -

	Yes	No
I have read the Plain Language statement	☐	☐
I understand the information provided.	☐	☐
I have received satisfactory answers to any questions I have about the project.	☐	☐
I know who to contact if I need to ask any more questions about the research.	☐	☐
I know that my child may withdraw from the research project at any stage.	☐	☐

I consent for my daughter to take part in this research project.

Daughter's Name in block capitals:

_____

Parent/Guardian Signature:

_____

Appendix L: Plain language statement for and assent form for students

Informed Assent Form
Student Copy

Dear students,

I am carrying out research on the use of iPads in Religious Education as part of study that I am doing in Dublin City University. I would appreciate your help with this. I would like to get your feedback on some of the activities we do with the iPads and I would like to keep a record of some samples of student work. This may include some or all of the following: audio, videotaping or photographs of class activities and the work we do. I won't include any of your feedback or work in my research without your permission. Your name will not be used and I will take all precautions to maintain your privacy and confidentiality. Your participation in this research is voluntary. If you choose to take part please note that you are free to withdraw at any point during the research.

Your participation won't involve any commitment outside of normal class time or activities. If you choose not to take part in the research, you will still complete the class activities but your work will not be used in the research. I hope that this research will help us to see how we can best use the iPads in the future and I look forward to getting your feedback and ideas.

I am sending a letter to your parents/guardians to get their permission for you to be part of this research project. If they give permission and you are happy to take part please sign below.

Please take time to read and answer the questions below. If you have any concerns or questions in relation to the research please contact me after class or email at a.travers@loretothegreen.ie

Participant – please complete the following (Circle Yes or No)

Have you read or had read the Informed Assent Form? Yes/No
Do you understand the information provided? Yes/No
Have you had an opportunity to ask questions and discuss this study if you wished? Yes/No
If you did ask questions, did you receive satisfactory answers to all your questions? Yes/No

I have read and understood the information in this form and therefore, I will to take part in this research.

Name in block capitals:

_____

Signature:

_____

Appendix M: First draft of Wonderlands project rubrics

Key Elements	Guiding Principles...	Marks Allocated
Creativity	• Thinking Outside the Box • Trying Something New For You • Original Ideas • The Wow Factor	20
Research skills	• Evidence of Research • Appropriate use of References and Quotes • Citing sources • Accurate Information • Copyright Checked and Correct	20
Content	• Relevance of Content • Organisation of Content • Clarity of Content	30
Cross-Curricular Links	• Identify Links to Other Parts of the Course • Identify Links to Other Subjects	10
Design	• Overall Layout and Presentation • Usefulness and Quality of Images with Relevant Captions • Usefulness and Quality of Media/Video with Relevant Captions	20
Literacy and Numeracy	• Key Words Identified and Integrated • Definitions Included • Good Spelling, Grammar and Punctuation • Well Written Original Content • Page Numbers	20
Digital Literacy	• App Smashing – use of other apps where appropriate – e.g. PicCollage/Animoto/Popplet • Good Quality Audio and Video • Web links Work • iBook Functions Correctly	20
Participation	• Group Dynamic • Individual Contributions • Collaboration and Communication • Preparation and Organisation	20
Project Completion	• Overall Presentation of Completed iBook • Ready to Publish	20
Reflection	• Ability to Discuss the Process • Identify Personal Strengths and Weaknesses • Identify Group Strengths and Weaknesses • Awareness of New Knowledge, Understanding, Skills and Attitudes	20

Appendix N: iPad expected use guidelines

Loreto College
St. Stephen's Green

iPad Expected Use Guidelines

Student Responsibilities

- Arrive to school with a fully charged iPad.
- Keep the iPad within a protective case and in a locker when not in use.
- Only the student herself, teacher & parents should use the iPad.
- Only apps requested by teachers should be downloaded.
- Tutors and subject teachers will carry out random iPad checks.
- The iPad must be left flat on the desk unless the teacher has instructed otherwise.
- iPads should only be used when students are seated or as instructed by a teacher.
- Students should close all apps at the end of each class.
- iPads are to be kept in school bags between classes.
- Cameras are only to be used within the classroom, and only when instructed by a teacher. A teacher may ask to see the Camera Roll at any time.
- Use of iPads at lunchtime is only permitted in the library.
- A copy of Apple ID and passcode should be kept somewhere private and safe.
- If an iPad is damaged in school it should be reported to the class teacher or Year Head immediately.
- A student who has forgotten her iPad should let the Year Head know as soon as possible.
- iPads should stay in school during sports trips.
- Social media and instant messaging apps should not be downloaded. If such an app is downloaded Wriggle will notify the school. An MDM profile has been installed on all students' iPads and should not be removed.
- The use of information technology in bullying or defaming any member of the school community will incur sanctions, as will any misuse of technology that brings the school into disrepute. [i]

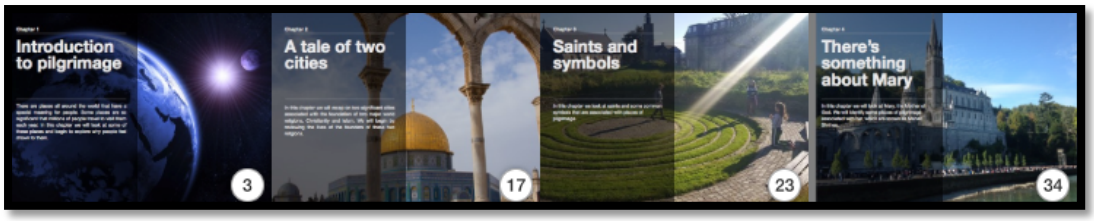
Parental Responsibilities

- It is the responsibility of parents/guardians to provide insurance for the iPad.
- Parents/guardians should check the iPad regularly to ensure all apps and content are school related.
- Parents/guardians should be aware that the school will not be monitoring the downloading of unapproved apps during the summer holidays. It is the parents/guardians responsibility to ensure the iPad has any unapproved apps removed before the return to school.

[i] Reference should be made to the school's Anti-Bullying and Acceptable Internet Usage Policy

Appendix O: Wonderlands Teacher Guidelines

Wonderlands Teacher Guide



An RE Curriculum for a 1:1 classroom by Ailís Travers

Introduction

This curriculum integrates technology, pedagogy and content to create an engaging approach to studying sacred places and pilgrimage in a 1:1 iPad classroom. This curriculum is an introduction to pilgrimage and gives an overview of a variety of places of religious significance. It encourages students to use their devices to explore and research these places. Students will be creators of content rather than consumers of content, as they will actively engage in presenting their work in a variety of formats culminating with the creation of a class iBook.

Accessing the *Wonderlands* iBook:

Access to the iBook is available by clicking on the image below. [Please note: To access it you must use an iOS device with the *iTunes U* app installed].

Aims

- Students will explore places of religious significance.
- Students will create content that can be used for peer teaching which will include text, audio, video and still images.
- Students will collaborate to design and publish an iBook that members of the school community, as well as a wider audience can enjoy.
- Students will develop their literacy skills with a key focus on digital literacy.

Learning Intentions:

- Define 'Awe & Wonder'
- Identify places that are considered to be of special significance and explain why they are significant
- Compare and contrast different places of religious significance
- List a variety of reasons that people might go on pilgrimage or visit places of religious significance
- Reflect on the importance of pilgrimage for Christians
- Describe the central role of the Hajj for Muslims
- Explain how a place of religious significance can give people a sense of awe and wonder and strengthen their faith.
- Collaborate to create original content that can be used for peer teaching which will include text, audio, video and still images.
- Develop literacy skills with a key focus on digital literacy.

Junior Certificate RE Links:

Pilgrimage is a key concept on the Junior Certificate Course and has significant links throughout the syllabus so it can be explored in a cross-curricular way. It comes directly from Section E, The Celebration of Faith, Part 1: The World of Ritual. It also links to:

- Part 2: The experience of worship, Part 3 Worship as a response to mystery, Part 4: Sign and Symbol, Part 5: Prayer
- Section A Communities of Faith, Part 3 Communities of Faith and Part 4: Relationships Between Communities of Faith

- Section B: Foundations of Religion – Christianity, Part 1: The Context
- Section C: Foundations of Religion – Major World Religions. Part 1: The Context, Part 3: Rites of Passage and Other Rituals
- Section D, Part 2: The Beginnings of Faith, Part 4: The Expression of Faith

While the theme of pilgrimage connects all the lessons, they can be used in a stand-alone manner or a section can be covered relating to the syllabus or they can be used together as a full curriculum taking a thematic approach to the syllabus.

Junior Certificate Key Concepts: *pilgrimage places of significance, actions of significance, times of significance, sacredness, worship, ritual, participation, reflection, encountering mystery, wonder, encounter with God, celebration, symbols, prayer, founders, The Holy Land, question/questioner, search, meaning/meaninglessness, reflection, awe and wonder.*

Future link with Junior Cycle Statements of Learning: Communicates effectively, Uses ICT effectively and ethically in learning.

Future link with Junior Cycle Key Skills:

Key Skill	**Digital Strand**
Communicating	Using digital technology to communicate
Being Literate	Exploring and creating a variety of texts, including multi-modal texts
Managing Myself	Using digital technology to manage myself and my learning
Staying Well	Being responsible, safe and ethical in using digital technology
Managing Information And Thinking	Using digital technology to access, manage and share content
Being Numerate	Using digital technology to develop numeracy skills and understanding
Being Creative	Stimulating creativity using digital technology
Working With Others	Working with others through digital technology

Time: This curriculum is envisioned to take six weeks based on forty minutes approximately per lesson three times a week if taught straight through.

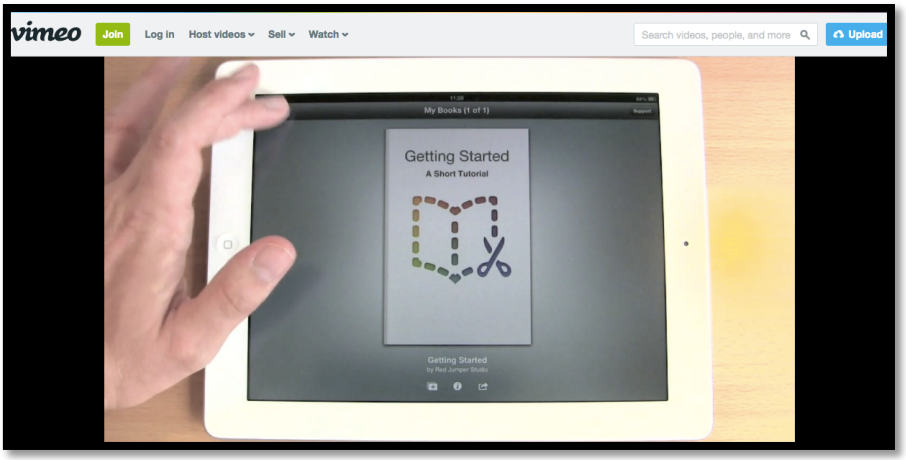
Technology checklist:

The resource is designed for use in a 1:1 iPad classroom. A data projector & internet access are needed for each lesson.

The key app that the teacher and students both need on their device for the final project is:

- Book Creator - for student created iBooks

Here is an introductory video to the app



You will find lots more information about the app here: http://www.redjumper.net/bookcreator/

The student research project is explained in the last chapter of the *Wonderlands* iBook. This includes a marking scheme and good research guide for students.

It is recommended that students have the following apps on their devices:

- PicCollage to design collages and posters and enhance photos with background and text.
- iMovie to record and edit videos

The following apps will also be used and are recommended but they can alternatively be used from their websites if there is not enough storage on the iPads.

- Padlet – a virtual wall for sharing ideas and resources
- Animoto - to create digital stories

The following websites can also be used to expand on and assess the iBook content:

- *Kahoot* – for fun assessment games
- *Quizlet* – to help students study and test themselves with online flash cards

It is recommended for teachers to create a digital workflow for collecting the Digital Disciple activities. Two suggestions for this are:

- Edmodo – a safe space for students to share work and ideas online
- Showbie – student preferred tool for uploading assignment

Overview of recommended apps: