ONLINE GLOBAL COLLABORATIVE EDUCATORS AND
PEDAGOGICAL CHANGE

A Thesis submitted by

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ABSTRACT

Despite over 20 years of internet access in the classroom, online global collaborative curriculum-based activities are not typical in K-12 schools. Those educators who are collaborating globally identify the potential for student-to-student global interactions leading to deeper understandings of how the world works. The scope of this study was educators in K-12 learning environments and included participants from different countries and school systems. The research was guided by the question, "How might online global collaboration influence educators' pedagogical approaches?" This qualitative study used a single case study methodology where the phenomenon of online global collaboration was explored through K-12 educator survey responses and interviews. The researcher used a two-part case study design to initially collected responses via a survey from a larger group of globally active educators. This led to the ultimate purpose of the survey for the selection of a smaller group of participants who were implementing extended and ongoing online global collaborations. Semi-structured interviews with selected participants explored the following points related to participants' school contexts: a) how online global collaborative learning was implemented; b) how these educators were influenced by their beliefs about teaching and learning; and c) how their personal pedagogies enabled online global collaboration.

Findings reveal that educators who successfully implement online global collaborative learning are champions in the digital learning environment, adopt constructivist beliefs and employ innovative pedagogical practices. The findings also reveal how educators developed a Global Collaborator Mindset (GCM), identified as having attributes of openness, connection, autonomy and innovation. Pedagogical influences inform the Online Global Collaborative Learning (OGCL) construct, developed as a tool for understanding classroom learning modes that are online, global and collaborative. The key outcome of the research is the OGCL Framework that encapsulates the wider pedagogical implication informing shift in practice for educators.

CERTIFICATION OF THESIS

This thesis is entirely the work of Julie Anne Lindsay except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Principal Supervisor: Dr Joan Conway

Associate Supervisor: Dr Petrea Redmond

Student and supervisor's signatures of endorsement are held at the University.

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> The Moving Finger writes; and, having writ,
> Moves on: nor all thy Piety nor Wit
> Shall lure it back to cancel half a Line,
> Nor all thy Tears wash out a Word of it.

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CHAPTER 1 - INTRODUCTION

1.1 Context of the Study

When K-12 schools started to integrate the internet in the 1990s, it opened a realm of possibilities for learning beyond the immediate classroom. In those early days, online global collaboration revolved around 'telecommunication' activities, while designed 'telecollaborative' projects inspired many educators to join themselves and their students to others in the world for enhanced learning outcomes (Harris, 1998). Since the 1990s governments and school organisations have spent millions of dollars providing hardware, software, and networking capability in schools in conjunction with professional development for educators so that classrooms are ready to connect and potentially collaborate (Selwyn, 2013; Ting & Scott, 2018). An array of online technologies for communication and collaboration, in conjunction with new pedagogical approaches to support online learning objectives, has enabled global connections and curriculum-based projects and informed global competence objectives (Andrews & Conk, 2012; Biswas-Diener & Jhangiani, 2017; Greenhow & Askari, 2017; Jimoyiannis, Tsiotakis, Roussinos, & Siorenta, 2013). Improved physical resources in schools have gone hand-in-hand with raised awareness of the possibilities afforded by digital technology-scaffolded learning (Digital Education Advisory Group, n.d.; Lock & Johnson, 2017). There continues to be a dearth of participation in online global collaborative activities by K-12 educators personally and by schools in general, despite ongoing awareness of the need for new pedagogical approaches to support future-ready students and equip them with transferable skills such as global competence and awareness, critical thinking and collaboration skills, and intercultural understanding (Fullan, Langworthy, & Barber, 2014; Zhao, 2018). Actively implementing online global collaboration is either non-existent or very low priority, or even blocked completely within a school.

Online global collaborative learning in the K-12 classroom may have the potential to fundamentally change educator pedagogical approaches and how learning takes place. As part of school reform, education organisations could likely benefit by taking more notice of these innovative practices as a humanistic way to

employ digital technologies in real-world capacities and to support future-ready skills, such as collaborative working modes in virtual environments to solve problems (Boudreau, 2016; Collaborative Society, 2013). Authentic collaboration beyond borders could amplify learning outcomes through improved teacher and student engagement, enhanced global competency and intercultural understanding (Flammia, 2012; Stornaiuolo, 2016). The purpose of conducting this study, therefore, is to explore the implications of the phenomenon that is online global collaboration through the lens of educator experiences, beliefs and pedagogies.

1.2 Motivation for the Study

The motivation to do this research came from my work as an educator in the technology-rich classroom and in education leadership positions related to Information Technology (IT), eLearning and curriculum development within K-12 schools. For 15 years I worked outside of my home country, Australia, as an educator and education leader in international schools in Zambia, Kuwait, Bangladesh, Qatar and China. Over ten years ago I developed a unique approach to using Web 2.0 for online global collaborative projects. Known originally as Flat Classroom and now through Flat Connections (http://flatconnections.com) I design and facilitate regular online global projects for K-12 students and provide online professional development for educators. For me, early inspiration for global collaboration came through an awakening of new possibilities for learning using the internet impacting the agency of human beings, individually and collectively, and the power of computing to bring people together virtually. The realisation that collaborative learning could be global and empower learners dramatically changed the course of my professional life. Online global collaboration ticks many of the boxes for technology-infused learning and future lifelong and life-wide skills such as digital literacy, media literacy, and virtual communication. I wondered if schools, school networks and government departments could look more closely at global collaborative applications in K-12 as a bridge to essential 21st century skills and competencies such as global awareness and cross-cultural skills, critical thinking and collaboration.

Anecdotally and experientially, I understood that educators who implemented online global collaboration were in some way 'changed' in their approach to teaching

and learning. Previous studies show how educators who had new understanding of the purpose and use of digital technologies, were comfortable and innovative with online learning, forged external relationships with other learners beyond the immediate learning environment and were willing to modify and adapt curriculum to include global collaborative opportunities (Duggleby & Lock, 2018; Oran, 2011; Wells, 2007). By doing this, they brought rich global, cultural and life-changing experiences to their students. There was potentially something else different about them, a combination of factors that included a skillset as well as a mindset. I identified a need to explore how these educators utilised online technologies for active online global collaborative learning in order to encourage wider informed adoption and adaptation. This study was important to me at this time because of where it could lead to and its potential impact on teaching and learning at the K-12 level.

Research by Ertmer (1999), and more recently by Brantley-Dias and Ertmer (2013) and Laurillard (2008) have documented the generally slow uptake of digital and online learning in the K-12 learning environment. In the early days of digital technologies in schools, this related more to first order barriers, namely lack of hardware, software and networking. Now that schools have more digital resources, there is sustained evidence that second order barriers predominate, including attitudes and beliefs about the efficacy of digital learning (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

The problem, as I see it, is that in the K-12 classroom emerging pedagogical approaches in relation to online global collaborative learning through the use of Information and Communication Technologies (ICT) that provide opportunity to connect and learn with others online have not been clearly identified. Education thought leaders such as Fullan et al. (2014) have suggested new pedagogical imperatives, but do not specify the global or cross-border aspect. This problem addresses the need to know school conditions, educator personal beliefs about teaching and learning with technology and existing and developing pedagogical approaches when embedding online global collaborative learning. These strategies,

beliefs and approaches may be utilising existing personal pedagogies, and there may be new or emerging practices influenced by online global collaborative practices.

1.3 Aim and Scope of the Study

The aim of this research was to determine how K-12 educators leveraged personal beliefs and pedagogies within the school context in order to implement online global collaboration in the classroom and to then explore how these practices may positively influence educator pedagogical change. It is likely that new pedagogies are emerging through educator participation in online global collaborative learning through the broader use of open digital and online technologies and desire for a more globally relevant and participatory education. An essential goal of this study was to investigate what these pedagogies are and how they might influence wider pedagogical change in the K-12 learning environment.

The main research question for this study was: How might online global collaboration influence educators' pedagogical approaches?

The following research sub-questions were developed to guide the exploration of the main research question:

RQ1. What are the experiences of educators who implement online global collaboration?

RQ2. How do educators' beliefs about learning and teaching influence their engagement in online global collaboration?

RQ3. In what ways do educators personal pedagogies enable online global collaboration?

The scope of this study was educators in K-12 learning environments and included participants from different countries and school systems. The research approach employed a post-positivist research paradigm supported by interpretivist methodology. A qualitative method with a single case study research design was implemented where the phenomenon was online global collaboration. A two-part research design began with collected responses via a survey from a large group of educators. This data helped identify educators who were already or planning to

participate in an online global collaboration of at least six weeks in length. Semi-structured interviews took place with eight invited educators who met those criteria. An important goal of this study was to collect narratives from K-12 educators located in different parts of the world who were somewhat experienced and proficient in global collaborative learning as opposed to researching global collaboration in a local context. This study did not include student-related data except for narrative examples from interviewees when they shared positive learning outcomes for students from online globally collaborative activities.

1.3.1 Putting the 'global' into online collaboration.

The focus of this study was online global collaboration. Clarity around terminology provides a fuller understanding of research goals, purpose and significance. In the context of this research 'digital' refers to the use of educational technology including hardware, software and networks, whereas the term 'online', a subset of digital, refers to specific digital tools and learning scenarios that support connections via access to the internet. This includes the use of web-based, VOIP, cloud-based, and virtual classrooms for synchronous and asynchronous connections. Online global collaboration broadly refers to geographically dispersed educators, schools and learning environments that use online and open technologies to learn with others beyond their immediate environment in order to support curricular objectives, intercultural understandings, critical thinking, personal, social and ICT capabilities (Lindsay, 2016). Pedagogical change refers to how educational goals might evolve due to a paradigm shift to constructivist teaching modes with a focus on cultivating a community of learners for online globally connected and collaborative learning. Although not in a global context, Redmond (2015) suggested a pedagogical continuum to online teaching, while Goodyear, Casey, and Kirk (2014) argued social media, such as Twitter, could be used for professional learning to support pedagogical change. According to Lock (2015), meaningful work in the global classroom requires a pedagogical shift. Further discussion around the distinction between online collaboration and online global collaboration ensues in the following paragraphs.

The word 'online' indicates attachment to digital technologies implying either local or global connections and collaborations. In the context of a university degree via distance education, students can enrol from anywhere in the world. Online learning in the context of K-12 is a developing concept and could include a school-based blended and/or flipped approach. Schools are adopting online collaborative practices based on increased availability of tools and enhanced pedagogical understandings of how these can support group work online and connected learning beyond the immediate school day. What is relevant is that learners understand the affordances of online technologies that scaffold new learning modes and are able to connect, collaborate and co-create as required.

The term 'global' may be redundant, or it may add value to the concept of 'online collaboration'. It may be that a global focus supports the study and understanding of different cultures and ethnicity is important, although that is not the focus of this research. One dictionary definition of 'global' is "of, relating to, or involving the whole world" (https://www.merriam-webster.com/dictionary/global). This meaning was adopted with some further explanation as to how it aligns with the proposed research and work in the area of online global collaboration. As a comparison, from the tertiary perspective, 'global' is not a word used readily and is considered superfluous by many. Online courses and degrees include students from anywhere, and there is no distinction made between 'local' or 'global' although learning is 'localised', despite being global or distant in participation. Students enrol with that one institution for the purposes of studying a chosen degree; rarely does one university connect with another for the purposes of collaboration on subject design and delivery of assessments that include co-creation of learning artefacts. The pretence of being or assuming 'global' is in fact a mirage.

The K-12 perspective is different and there is a tendency to use the word 'global' to indicate connections with others beyond the immediate school or situation. It does not always mean these connections are geographically distant; it could mean learners are in fact in the same town, state or country. What educators are inferring is a desire to have a cultural (and global) learning exchange with others who are not in their immediate presence (experts, peers and others). Referring back

to the definition of global being "of, relating to, or involving the whole world" then the disposition and mindset towards a learning experience that potentially includes many across the world legitimises 'global' in order to clarify and distinguish practices from those that are alternatively 'local' and within the same school. Therefore, within the purview of this research there is no redundancy of words in the phrase 'online global collaboration'. It is important to use the word 'global' in the context of online collaboration as it especially refers to K-12 educators who are striving to connect student learning to others beyond their school.

1.4 Significance of the Study

By addressing the research questions identified in the previous section, the study has the potential to contribute to the fields of education, the use of online and digital technologies, online learning approaches, and pedagogical applications at all levels of learning, and is therefore significant in a number of ways.

Firstly, it is anticipated this study could complement and advance current research on constructivist approaches. This includes the use of online technologies and Web 2.0 tools for connecting beyond the classroom and constructivist learning techniques that support collaboration and co-creation of knowledge between disparate learners.

Secondly, this study informs examples of how educators practically embed online global collaboration into the curriculum through examining issues around the use of technology integration for teaching and learning related to educator beliefs and practices, school infrastructure, and educator autonomy and pedagogy. Research into barriers and enablers within school systems benefit from a wider education community in terms of targeting effective educator belief and practice to support collaborations for global learning afforded by online technologies.

Thirdly, practical approaches emerged from the findings to improve intercultural understanding and global competency and support the development of Information and Communication Technology (ICT) capability (for example, as detailed in the Australian curriculum, https://www.australiancurriculum.edu.au/). These provide an

access pathway to allow more teachers to understand how to use technology on support of the specified objectives.

Finally, as a result of online global collaborative practices this research reveals new educational techniques and pedagogies and is important to determine why and how educators are changing or evolving pedagogy, redesigning their curriculum and refocusing their classroom practice to include online global collaborative learning. This applies to the impact on learning when the classroom becomes 'many' students and 'many' teachers and how creation of a valid model of collaboration, using online technologies across all disciplines may be possible. The aim is to better understand online global collaborative practices and the subsequent impact on educator pedagogical change.

1.5 Structure of the Thesis

This thesis is presented in seven chapters. This first chapter has introduced the motivation for the study and the research problem. It also contextualises the context of the problem and places it in the K-12 classroom with a focus on the educator.

Chapter 2 presents the background to this study including a discussion around related literature from three main areas: 1) Theoretical background to learning approaches, teaching and learning with technology; 2) Collaboration and learning - local to global practices; and 3) Pedagogical and dispositional challenges to online global learning. From this analysis, the most pressing gaps relative to this study in the literature are identified and research focused accordingly. Chapter 3 provides the philosophical foundations, research methodology and specific details of procedures and instruments in the qualitative case study design to collect, present and analyse data.

Chapter 4 introduces K-12 educators who implement online global collaboration by sharing contributions from the Phase 1: Online survey. It also details the selection process for choosing eight global collaborative educators for Phase 2: Semi-structured interviews, and shares participant profiles. In Chapter 5, visual and descriptive data introduces each of the eight online global collaborative interviewees.

Based on the research questions, narrative data are presented to feature each individual 'voice'.

Chapter 6 is where a synthesis of thematic findings is presented and discussion is based on the sub-research questions and around three main themes: 1) The educator as online global collaboration champion; 2) The educator as proactive believer; and 3) The educator as online global collaborative pedagogue. It reveals educator practices, beliefs and pedagogical approaches to implementing online global collaboration in the K-12 classroom. It also presents outcomes from the research, namely the Global Collaborator Mindset, and the Online Global Collaborative Learning (OGCL) Construct. Chapter 7 contains final conclusions from the study aligned with the main research problem revealing the Online Global Collaborative Learning (OGCL) Framework as a pedagogical construct. It also includes a reflective evaluation of the study suggesting further research agendas, implications and recommendations for K-12 and higher education.

1.6 Chapter Summary

This initial chapter has provided contextual background and discusses pertinent definitions and researcher understandings, outlining the approach taken to the research in this study. It has framed the dissertation by discussing the significance of the research and outlining the research problem. As an introduction it prepares the way to the relevant literature in Chapter 2 and consideration of the research questions in subsequent chapters.

CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction

The purpose of this qualitative inquiry was to explore the background to and influences enabling and phenomenon of online global collaboration. In doing so it was proposed that a clear and logical link between the occurrence and relevance of this practice in K-12 learning and the potential impact it has on educator emerging pedagogical practices might be realised.

This chapter presents the background to this study with a critical review of the literature in the following three areas:

1. Theoretical background to learning approaches, teaching and learning with technology: A review of relevant learning theories is followed by an exploration of the practice of technology integration and online learning. There is a focus on teacher professional development and 'outlier' tendencies.

2. Collaboration and learning - Local to global practices: The background and practice of collaboration and online collaboration is followed by an overview of perspectives and modes of online global collaboration. Teacher education practices are included.

3. Pedagogical and dispositional challenges to online global learning: Research into educator beliefs, mindsets and pedagogical practices around collaborative and global learning is the focus, followed by a discussion around pedagogical change.

This study focused on online globally collaborative educators in K-12 learning environments, however the term *educator is* used broadly and inclusively. The literature is a combination of research around theories, beliefs and practices from predominantly K-12 with some reference to higher education.

2.2 Theoretical Background to Learning Approaches, Teaching and Learning with Technology

Underpinning this research are relevant theories related to how learners learn and how educators approach teaching and learning in the digital classroom. This initial review of learning theories impinges on technology-infused global collaborative practices revealed by a discourse around online learning and technology integration, educator professional development, and the global educator as outlier.

2.2.1 Theoretical background.

From the 1990s the internet provided a platform for thinking and learning collaboratively. Access to socially based technologies and networking facilitated online communities of inquiry (Garrison, 2016) became a catalyst for new learning paradigms. These new paradigms have helped to change the role of the educator in the classroom and informed approaches to professional learning.

2.2.1.1 Constructivism.

A constructivist approach is fundamental to collaborative learning. Constructivism, as a learning theory, is an epistemological view about how knowledge is constructed which is, "dependent upon individual and collective understandings, backgrounds and proclivities" (Anderson, 2016, p. 38). Constructivist theory originated from the work of two psychologists: 1) cognitive development theory and how the mind processes information (Piaget, 1929); and 2) social development theory where students play an active role in learning as opposed to 'transmission' of knowledge from the teacher (Vygotsky, 1978).

Cognitive constructivism is when learners internalise or make sense of the content presented to them (Kuit & Fell, 2010), while social constructivism, where social interaction helps learners construct meaning through knowledge and understanding, is the theoretical basis of collaborative learning (Laurillard, 2009). Social constructivism puts pedagogical emphasis on the role of collaboration amongst students and educators where the student is more actively involved (Harasim, 2012). Harasim (2000) considered that in the new, digital and online

learning paradigm collaborating in groups is essential, aligning with the research by Garrison (2015) who considered collaborative constructivism involves authentic communication, reflection and discourse. Collaborative settings support construction of personal meaning where misconceptions can be detected and challenged and a sense of mutual interdependence and trust created.

2.2.1.2 Constructionism.

Papert (1986) took constructivist principles to coin the term 'constructionism' which in its simplest form is student-centred learning whereby something tangible is created through techniques such as programming, simulating and modelling. Three key ideas underpin constructionism: appropriation; knowledge construction; and learning cultures (Parmaxi & Zaphiris, 2014). Emphasis is on the creation of artefacts, often in a cultural learning context, and the learning that takes place during this process.

Building on constructionism (Papert, 1986) and distributed cognition (which proposes cognition and knowledge are distributed across objects, individuals, tools and artefacts in the environment (Hutchins, 1991)); Resnick (1996) introduced the concept of distributed constructionism where computer networks support student collaborative design and construction of artefacts. Three types of distributed constructivist activities include: discussing constructions; sharing constructions; and collaborating on constructions (Resnick, 1996). This theory removes information as the centre of networked-related activity and focuses on group and community knowledge building as integral to the process of artefact construction. The examples provided by Resnick (1996) to support the three types of distributed constructivist activities focussed on real-time collaboration through networked experiences like MUDs (multi-user domains). Lloyd and Duncan-Howell (2008) described a contemporary exemplar of distributed constructionism through an Australian cross-school student team-based online project, the Land Yachts Project. Collaboration in the project was largely offline and localised teams worked on group creations, however active online collaboration supported the construction process through co-commenting on asynchronous shared contributions via blogs.

Social constructionism, distinct from but related to distributed constructionism, focuses on the artefacts created through social interaction, and is removed from social constructivism which focuses on the individual learning (Harasim, 2017). Parmaxi and Zaphiris (2014) found momentum growing for both distributed and social constructionism as a comprehensive framework that could ground the use of technology (Web 2.0 and social media) in several settings allowing learners to be active designers and constructors of knowledge.

2.2.1.3 Community of Inquiry (CoI).

As a conceptual framework identifying elements essential for online learning, a Community of Inquiry (CoI) model is useful to explore teaching approaches in the K-12 online global collaborative space (Garrison, Anderson, & Archer, 1999). Garrison (2016) philosophically espoused a CoI as a collaborative approach in that learning never takes place in isolation or devoid of environmental influences. The CoI model (Garrison, 2016; Garrison et al., 1999) included three elements that create a collaborative constructivist learning experience: 1) Teacher presence; 2) Social presence; and 3) Cognitive presence. Teacher presence speaks to the need for learning design and facilitation to ensure productive and sustainable participation in the CoI. Social presence makes a difference in how the 'message' or information is shared and interaction is necessary to establish relationships as foundation for a deep and meaningful educational experience. However, Garrison (2015) informed that interaction does not equal collaboration, and that thinking collaboratively recognises the open nature of inquiry. Cognitive presence applies to sustained reflection and discourse leading to the construction of meaning.

An interesting adaption of the CoI model comes from Redmond and Lock (2006) through creation of the 'Online collaborative learning framework'. Designed for local, national or international collaborations, the framework was applied to post-secondary classes for synchronous meetups and asynchronous discussion forums. Featuring the three key elements of the CoI model (teacher, social and cognitive presence), the framework informs collaborative interaction and higher order thinking leading to co-construction of knowledge. It supports global classroom experiences,

as applied to K-12 also, through teaching and learning beyond classroom walls, including virtual teamwork.

2.2.1.4 Community of Practice (CoP).

Conceptually, a Community of Practice (CoP) describes how people engage in a process of collective learning that creates bonds between them in a shared domain of human endeavour (Wenger, 2001), and where experiences are shaped by the many as opposed to the individual teacher (Wenger, White, & Smith, 2009). Situated learning theory reveals learning as a process of becoming a member of a sustained community of practice (Lave, 1991), and proposed that real-life problem solving should be a collaborative task empowering learners to join learning communities (Beldarrain, 2006). In addition, the CoP model extends essential networking and connecting ideals to inform how a community can come together for collaborative learning and suggests principles that communities can follow (Wenger, McDermott, & Snyder, 2002).

With the advent of online networks, participation in a virtual CoP provides advantages. These include: a model for learning involving a group of networked learners who share a craft and/or a profession (Wenger, 1998, 2000); emotional support, overcoming isolation, seeking advice and access to new knowledge and ideas (Hur & Brush, 2009; Sheehy, 2008; Trust & Horrocks, 2017); and ongoing support outside of formal training leading to improved student learning outcomes (An & Reigeluth, 2011; Trust, 2016). Communities of practice also inform social constructivist pedagogy for educator online professional development (Mackey & Evans, 2011). A blended CoP potentially supports K-12 educators' learning and growth as individuals and professionals across multiple domains, that is, individual, classroom, school, CoP (Carpenter & Krutka, 2014), and allows educators to engage with a supportive community (Bielaczyc, Kapur, & Collins, 2013). Interestingly, Arnell (2014) found that a CoP served as a tool for educators to engage in educational discourse yet did not create the necessary impetus for individual growth and exploration after participation.

An example of collaboration and CoP development between institutions at the higher education level is iCollab, an international CoP that connected students and lecturers across seven higher education institutions in six countries (Cronin, Cochrane, & Gordon, 2016). The four-stage icollab global collaboration framework (establishing a core CoP, brokering participation, nurturing participation, and brokering practice) supported goals that challenged traditional structures and provided unique opportunities for collaboration around and beyond module topics using mobile technologies and social media tools. As an open, online and connected approach to global community learning, iCollab redefined pedagogy around student co-creation and provided parallels with and potential to inform K-12 practice (Cochrane et al., 2013).

2.2.1.5 Connectivism.

Connectivism theory describes a form of knowledge and pedagogy based on the idea of distributed knowledge across networks of connections and learning that consists of the ability to construct and traverse those networks (Downes, 2006, 2007; Siemens, 2005, 2006a). Connectivism also acknowledges expertise of other participants, self-managed and autonomous personal learning, and creates conditions for motivated learning rather than instilling core knowledge (Downes, 2008, 2014). Social learning is integral to the theory and practice of Connectivism, and is more about learning how to learn with others where the end-user constructs knowledge through contribution and involvement within the network (Siemens, 2006a).

2.2.1.6 Heutagogy and self-determined learning.

Andragogy, based on the assumptions of self-direction and independence, applies to adult learning, *andra* meaning man (or adult). The andragogical model gives learners control over learning, to become self-directed and to realise actualisation while encouraging educators to become facilitators, tutors or mentors rather than knowledge dictators (Blaschke, 2012; Victor & Susan, 2014). Pedandragogy, a model proffered by Samaroo, Cooper, and Green (2013), is a synthesis of the core elements of pedagogy and andragogy. It brings children and adults together, is learner-centred, and promotes self-engaged learning and self-efficacy where the teacher is both facilitator and learner (Samaroo et al., 2013).

Named after the Greek word for 'self', heutagogy, as with andragogy, embraces self-directed learning (Agonács & Matos, 2019; Anderson, 2016) and is defined by Hase and Kenyon (2000), as the study of self-determined learning. Built on Vygotskian (1978) constructivist theories and associated with connectivism as compatible theories, more recently heutagogy refers to human agency as central to its theory and practice (Hase, 2016). Heutagogy supports going beyond simple acquisition of skills and knowledge as a learning experience and challenges the teacher-learner relationship existing in the pedagogical and andragogical models. Design of heutagogic learning includes being able to explore, create, collaborate, connect, share, and reflect (Blaschke & Hase, 2016). Applying principles of heutagogy holistically enables flexible, pro-active, non-linear learning and capable learners who know how to learn, are creative, have a high degree of self-efficacy, apply competencies in new and familiar situations, control their own learning and work well with others (Hase & Kenyon, 2000). If we understand that pedagogy fosters 'engagement', and andragogy 'cultivation', then heutagogy requires learner maturity and autonomy through 'realisation' (Blaschke, 2012). More importantly, and related to the focus of this research, collaborative learning is a critical component of a heutagogical approach in the classroom where learners create shared meaning and apply this through reflective practice (Blaschke, 2012; Hase, 2016).

In a recent review of published literature on heutagogical practice, Agonács and Matos (2019) postulated that the theory of heutagogy applies to anybody of any age. Young learners can also engage in educational experiences based on heutagogy that involve self-determined and self-driven learning (Gerstein, 2014). Further to this, according to Gerstein (2014), the evolution of the web has influenced changes in people's perceptions, thinking and behaviour. She uses the metaphor of Education 1.0, 2.0 and 3.0 referring to an evolution of understanding and practice. Education 1.0 applies to learners receiving information according to behaviourist approaches within a traditional pedagogical teaching framework. Education 2.0 is like Web 2.0 and encourages interaction between the user and the content and between users in an andragogical, constructivist approach, utilising project-based learning and collaborative learning modes. In an Education 3.0 context, attributes of heutagogy

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and connectivism applied to learners include: self-determination of learning objectives; use of learning preferences and technologies to decide how to learn; formation of personal learning communities; utilisation of experts and other learning community members to introduce resources and tools for artefact creation; and initiation of feedback from educators and peers.

2.2.3 Learning online.

In 1992 when the World Wide Web became available in classrooms, online education was accessible, new pedagogical models emerged and new models of online learning catalysed a paradigmatic shift in learning (Harasim, 2000). First used in the 1990s the term e-Learning initially referred to asynchronous learning, such as discussion forums (Eaton, Brown, Schroeder, Lock, & Jacobsen, 2017). However, with improved tools and bandwidth, synchronous communication via video conference opened new possibilities for learning with others and Garrison (2011) defined e-Learning as "electronically mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge" (p. 2). According to Bonk (2016), e-Learning is where informal and on-demand online learning is prevalent and often free. In this context learning is: more collaborative where teams interact and share ideas; more social through medias that bring communities together online, in line with the theories of Vygotsky (1978); more global with networks, opportunities for synchronous and asynchronous learning; and, more open through access to OER (Open Educational Resources). In recent years, the scope of online learning or 'e-learning' can be transformational, not limited to the face-to-face classroom experience, and has the potential to create global virtual communities in both blended and online modes, for the purpose of thinking and learning collaboratively (Garrison, 2016). Interaction is an attribute of online learning when using media that allows for independence of time and distance. Constructivists stress the value of peer-to-peer interaction, although this is traditionally downplayed as a requirement of online learning (Anderson, 2004).

2.2.3.1 Connected learning.

Connected learning makes use of new technology tools to build online networks and develop personal learning resources. This is achieved through interaction with

personal learning networks (PLNs) and professional learning communities (PLCs) (Siemens, 2005). Connected learning provides the infrastructure for online collaboration as a personal, social and participatory pedagogical approach using digital technologies (McLoughlin & Lee, 2010). Related to, and influenced by connectivism theory (Downes, 2006, 2007; Siemens, 2005, 2006a), connected learning explains how the internet has created new opportunities for people to connect, network and share information (Siemens, 2005).

2.2.3.2 The ecology of connected learning and open practices.

Learning ecologies are: diverse, multifaceted learning spaces where specific tasks align with the unique nature of different learning approaches (Siemens, 2006b); a set of contexts found in physical or virtual spaces that provide opportunities for learning (Barron, 2006); and an 'open' system, dynamic and interdependent, diverse, partially self-organizing, and adaptive to a new kind of learning matrix (Brown, 1999). More recently, and pertinent to how global connections and collaborative relationships are formed, Siemens (2019) shared further thoughts around networks and networking stating connections and networks exist within a system (such as Twitter), which is a set of entities governed by rules. Systems matter more than networks, and they determine individual actions: an ecology is a system. The essence of social learning and life-long learning related to a web-enabled learning ecology, is a shift from using technology to support the individual to using technology to support relationships (Brown, 1999). Greenhow, Robelia, and Hughes (2009) suggested that to take a learning ecology perspective helps conceptualise, study and bridge learning and teaching across Web 2.0 tools and spaces. In terms of new learning ecologies for educator development, An and Reigeluth (2011) suggested building communities of practice, social networks or collegial groups in which educators can share and explore new teaching methods and tools and help each other.

Open educational practice (OEP) interconnects with this discussion around a connected learning ecology. Defined by Cronin (2017) as "collaborative practices that include the creation, use and reuse of OER [Open Education Resources], as well as pedagogical practices employing participatory technologies and social networks

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for interaction, peer-learning, knowledge creation, and empowerment of learners" (p. 18), OEP relates to educator willingness and ability to share openly. This includes resources like student learning processes and outcomes and educator personal professional practice through media such as blog posts and Twitter. Educators who value OEP characteristically balance privacy and openness, develop digital literacies, value social learning, and challenge traditional teaching role expectations (Cronin, 2017).

2.2.4 Technology integration in schools.

Technology integration is the use of technology for instructional purposes (An & Reigeluth, 2011) and the accomplishment of learning outcomes through effective implementation of educational technologies (Davies & West, 2014). Standards related to teaching and learning have reflected the need to support ICT for expanded learning opportunities and content knowledge (AITSL, 2014) and for collaboration and creation as well as networking with other professionals (ISTE, 2015). Despite standards inclusive of collaboration afforded by digital technologies, such as ISTE (International Society for Technology in Education), and transmission teaching having moved to experiential learning in the twentieth century (Dewey, 1938), integration of technologies has been largely premised on traditional pedagogies. Educators continue to use digital technologies more for delivery, such as finding information on the internet, practising routine skills, writing up an assignment and 'tell-practice-test' requiring only presentational technologies (Laurillard, 2008), rather than for collaboration and knowledge creation, such as working with others beyond the classroom or developing simulations or animations (Fullan et al., 2014). Ertmer and Ottenbreit-Leftwich (2013) encouraged a shift to 'technology-enabled' learning that focused on the pedagogies needed rather than technology integration where the focus is on the tools. This builds on the work of Jonassen, Carr, and Yueh (1998) who claimed technology should be for knowledge construction. Although digital learning technologies have brought education to the brink of transformational change, it has been on the brink for some decades now (Laurillard, 2008).

2.2.4.1 Barriers to technology integration.

Research shows that factors impacting the ability of educators to integrate technology included: a lack of access to the technology and a lack of time to integrate (An & Reigeluth, 2011); adoption of technology at low levels due to unwillingness to change teaching practices (Ertmer, 2005); lack of knowledge on how to integrate in conjunction with workplace contexts constraining individual efforts (Ertmer & Ottenbreit-Leftwich, 2010); assessment and institutional structure (An & Reigeluth, 2011); and lack of relevant professional development (Ertmer et al., 2012). Mueller, Wood, Willoughby, Ross, and Specht (2008) found important variables in technology integration included a combination of experience with computer technology and attitudes toward technology in the classroom reporting that educators at all stages of their career were equally able to integrate computer technology.

Ertmer (1999) segregated barriers to technology integration into first and second order categories. First order barriers are extrinsic to the person and include lack of access to hardware and software, lack of time to plan, and inadequate technology and/or administrative support. Second order barriers are intrinsic to the person and include beliefs about teaching and teacher-student roles; beliefs about computers and the relevance of technology to the curriculum; beliefs about established classroom practices in terms of methods, organisation and management; and unwillingness to change. In order to overcome both first and second order types of barriers, Ertmer (1999) suggested strategies that included developing a vision through modelling, reflection and collaboration; identifying curricular opportunities to support the 'how' of integration; and obtaining resources such as time and support. Overcoming second order barriers however, which are harder to define, more ingrained and less tangible, challenge both personal belief systems and practices. Ertmer suggested those educators not facing second-order implementation barriers had already redefined teacher-student roles and organised the classroom into multi-disciplinary teams with a focus on authentic problems. Subsequent studies by Ertmer, Ottenbreit-Leftwich, and York (2006) and Ertmer et al. (2012) revealed that addressing second order barriers of attitudes and beliefs was the most successful way of bringing educators 'on board', enabling them to circumvent first order barriers within their schools.

Based on the analysis of 48 empirical studies (from 1995-2006), Hew and Brush (2007) identified the three most frequently cited barriers faced by K-12 schools when integrating technology into the curriculum for instructional purposes. These were resources (40%), teachers' knowledge and skills (23%), and teachers' attitudes and beliefs (13%). They suggested strategies to overcome the barriers including obtaining the necessary resources, having a shared vision and technology integration plan, facilitating changes in attitudes/beliefs, professional development, and reconsidering assessment.

2.2.4.2 Web 2.0 and online learning modes.

From about 2005, the advent of the 'read and write' web, known as Web 2.0 changed the learning environment in the K-12 classroom to be potentially more online, connected and collaborative. Technologies, including blogs, wikis, social bookmarking and RSS, influenced a move from the static 'Web 1.0' environment, and presenting knowledge became constructing knowledge and co-construction of resources by communities of contributors (Dede, 2010). Characteristics of Web 2.0 included: owning moved to sharing with others online; content management systems moved to group-edited wikis and open platforms relying on participation and collective knowledge (Kuit & Fell, 2010); and large numbers of people were able to build online communities for creativity, collaboration and sharing (Dede, 2010). With Web 2.0, educators could embrace new digital tools and the ability to learn online in classroom social networks and develop student online collaborative skills (Scalise, 2016).

In the broader definition of Web 2.0, Greenhow et al. (2009) included social networking software (SNS), collaborative knowledge development, content aggregation and organisation, and remixing or mash-ups of content. Typical Web 2.0 features allowed learners to create, consume and share interactively on a global scale with very little technical expertise (Greenhow et al., 2009). Not only could users share knowledge through collaborative editing, tagging and 'liking' across SNS, they could also dynamically change the content of knowledge published on the web (Kale & Goh, 2014). Certain challenges accompanied this Web 2.0 connected learning

approach including: the mismatch between an open-ended knowledge community and established content-based learning (Slotta & Najafi, 2013); concerns about access, alignment with pedagogical practices, school curriculum and assessment focusing on individual attainment; and teacher ability to select and manage Web 2.0 tools effectively for learning (Kale & Goh, 2014).

Researchers argued that best practice using Web 2.0 tools required instructional design and facilitation, and, given the affordances of the tools, clear pedagogical models to stimulate participatory learning and social connection between learners (Koehler, Newby, & Ertmer, 2017; McLoughlin & Lee, 2007; Slotta & Najafi, 2013). Blaschke (2012) acknowledged the affordances of social media and Web 2.0 technologies to complement and support the learning approach of heutagogy by allowing learners to actively direct and determine their learning experiences. However, Krutka and Carpenter (2016) related how this was potentially a disadvantage when like-minded individuals came together in an 'echo-chamber' style community, agreeing and repeating (e.g. retweeting) like-minded thinking, rather than deeper learning through critically considering other perspectives.

Once Web 2.0 emerged in the classroom, tools and online social networks afforded enhanced ability to connect students with peers, collaborative learning and contribution aggregation (Slotta & Najafi, 2013), leading to reorganisation of communities and student-centred collaborations (Casey & Evans, 2011). A high school science class climate change project used Drupal as the collaborative Web 2.0 tool to connect students with peers making learning more social and engaging (Slotta & Najafi, 2013). The use of a Ning (http://ning.com), a platform for online community sharing and collaboration, to bring together educators and students in virtual schools in New Zealand in 2008-9, provided a safe place for cross-group and cross-class interaction and projects (Barbour & Plough, 2012). When visiting classrooms to observe Web 2.0 use, Light and Polin (2010) found tools were not used in isolation but formed a daily part of classroom activities and, although not global in context, the knowledge that students' work would be viewed by others shaped outputs, and communication was enhanced among students, between students and teachers, with parents, and between teachers. In the elementary school

classroom, Phirangee (2012) found Web 2.0 use meant a shift in how the classroom was defined: the student role changed when online from consumers to producers; and learning become virtual as well as physical with interactions between students and educators at different times, spaces and ways.

Research by Reich, Murnane, and Willett (2012) on wiki usage in the USA by K-12 schools examined 180,000 wikis. The investigation disclosed that 74% of wikis were used for teacher resources and content delivery, 25% for individual student work and portfolios, while only 1% was used for collaborative student presentations and workspaces. The Flat Classroom Project (Lindsay & Davis, 2012) was found to be a 'proof of concept' that a wiki-based Web 2.0 learning environment could prepare students to thrive in a networked world through facilitating rich educational experiences (Reich et al., 2012).

A powerful application of emerging technologies for achieving important human objectives, not conceivable without Web 2.0 tools was revealed in the research of Union and Green (2013) and of Smirnova and Ivushkina (2013). The impact while using Web 2.0 tools on learning and social as well as cultural practices through interaction with others indicated the technology, to a measurable extent, helped impede student ethnocentrism and promote positive working relationships in the K-12 globally collaborative classroom (Union & Green, 2013). In a similar approach, but this time with higher education learners, Smirnova and Ivushkina (2013) discovered cultural stereotypes were broken when learning took many forms including language skills, the use of technology to connect and collaborate and an appreciation of the importance of global community learning and collaboration between classes.

2.2.4.3 Professional development for educators.

Of key importance is where and how educators learn new approaches to online connected and collaborative learning. In recent years, a theoretical framework about the relationship between technology and teaching that potentially transformed the conceptualisation of educator practice and knowledge is the Technological, Pedagogical, Content, Knowledge (TPACK) model (Mishra & Koehler, 2006). The

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framework considers how content, pedagogy and technology dynamically co-constrain each other and help build educator knowledge for technology integration. The TPACK framework declared that technology integration needed more than technical skills (An & Reigeluth, 2011). Archambault, Wetzel, Foulger, and Williams (2010) integrated a TPACK for educator professional development (PD) and redesign of learning in order to integrate Web 2.0 tools and the learning affordances these provide. Albion, Tondeur, Forkosh-Baruch, and Peeraer (2015) observed how TPACK was a framework, a conceptualisation of knowledge teachers required to integrate ICT and therefore was leveraged for teacher PD resulting in significant improvements in pre-service teachers' TPACK confidence.

Contextualisation of educator PD to the pedagogical needs of learning recognises links between technology, pedagogy and content and is a way to improve technology practices for integration and professional learning (An & Reigeluth, 2011). It can also grow human capacity in how to leverage the technologies to provide, increase, improve and/or assess student learning (Ertmer, 1999). Lantz-Andersson, Lundin, and Selwyn (2018) found sustained interaction between educators, self-directed research, and reading are key forms of professional development.

Online communities and networks provide 'bottom-up', self-directed, networked and ongoing learning experiences, considered by educators a meaningful form of PD allowing them to find knowledge for their craft (Hur & Brush, 2009; Trust, 2016). Trust and Horrocks (2017) found educators benefited from ongoing engagement in learning with others through a diverse range of means and recommended opportunities for PD be informal, formal, in-person and online (such as Twitter chats) and be accessed in multiple ways. Interestingly, Trust (2016) found one tension educators faced was how to accommodate global knowledge within their local working context. Digital technologies play an important role in supporting and proliferating these online communities, that are now much larger in scale than face-to-face communities (Greenhow & Askari, 2017; Lantz-Andersson et al., 2018). Carpenter and Krutka (2014) revealed those who had utilised Twitter longer were significantly more likely to use it for networking, collaborating with colleagues,

participating in Twitter chats, 'backchanneling', emotional support, communication with students, and in- and out-of-class activities. In a recent study of formal and informal online educator communities since 2000, Lantz-Andersson et al. (2018) found that formally organised online teacher communities provided a means for exchanging and sharing information, a source of collegial support, and a source of emotional engagement and reflection. Participation barriers included time to attend synchronous activities across time zones and to attend online activities; lack of teacher skills; and internet/connectivity issues. Vivian, Falkner, and Falkner (2014) found sharing best practice and strategies internationally supported the cross-pollination of ideas and helped develop effective pedagogy, professional learning and resources enhancing student learning and engagement through computing education.

A model for technology integration revolving around mentoring developed by Kopcha (2010) recognised the barriers of time, skills, and technology access regarding educators and technology integration. The fourth and final stage of the mentoring model develops a community of practice to sustain new practices and proliferate the mentoring approach. When implemented in an elementary school over a 2-year period the results suggested that enacting a variety of situated learning activities around the principles of effective professional development may be the key to providing teachers with the knowledge and support needed to integrate technology more fully into their instruction (Kopcha, 2012).

A qualitative study of over 700 P-12 educators by Krutka and Carpenter (2016) revealed PLNs as socially beneficial through connecting, collaborating and communing. They found digital tools cut through various types of isolation identified by educators included geographic, content area, grade level, learning disposition, and educational philosophy, while PLNs formed face-to-face, online and blended, offered professional growth not otherwise possible as well as inspiration and energy, diverse perspectives and global connections. Some educators shared how their students were also collaborating and building a PLN and learning through peer interaction in a global way while others noted a shift in mindset from passively

awaiting training towards active ownership of their professional growth, and a positive uptake of professional reflection (Krutka & Carpenter, 2016).

2.2.4.4 Outliers and isolation.

According to the English Oxford Dictionary, an outlier is 'a person or thing situated away or detached from the main body or system' (https://en.oxforddictionaries.com/definition/outlier). Within an educational context, Arteaga (2012) advised a K-12 educator outlier as someone who is "self-directed to create and develop an innovative pedagogy using emerged or emerging digital social media through collaborative and global open networking" (p. 14). According to Arteaga (2012), self-motivated outlier educators break through the frustration and disconnect of isolation within a school, leverage global networks and drive educational change. Based on research into outlier educators who used collaboration to formulate a digital pedagogy, Arteaga (2012) concluded that educator professional learning should adopt social interactive practices in conjunction with reorganisation of learning spaces (physical and virtual) to accommodate new modes of knowledge flow, as well as opportunities for learner connection, recombination and re-creation.

Research by Arnell (2014) also found that where work environments did not facilitate professional networks, educators found virtual networks to break the internal isolation and provide collaborative collegiality. Research that focused on new educators, and explored telementoring, mentoring by veteran teachers, novice teacher learning communities and peer coaching, found mentoring programs reduced educator isolation and kept educators motivated while improving skills and self-efficacy (Heider, 2005). Whereas, Zhao (2018) suggested ways to overcome isolation include collaborative or team teaching. He also indicated a cultural change (as found in China, Japan and Finland) where teaching is a collective responsibility and teachers' social capital positively affects student learning.

2.3 Collaboration and Learning - Local to Global Practices

This section of chapter 2 explores the concept and practice of collaboration, leading to online collaborative learning and communities for collaboration. It examines the historical context, thought leaders and evidence of research into online

global collaboration, global collaborative projects, design and facilitation expectations, and application to teacher education.

2.3.1 Defining collaboration in learning contexts.

For decades, educators have struggled with a definition of collaborative learning that includes multidisciplinary processes and enhanced learning outcomes (Dillenbourg, 1999). In the broadest sense, 'collaborative learning' is a situation in which two or more people learn or attempt to learn something together. It is distinct from cooperative learning where the required tasks are distributed amongst the learners (Laurillard, 2009), or when connected learners rely on each other to share, and where knowledge construction is individualised within a group (Nussbaum-Beach & Hall, 2011). Collaboration, the building of something through participation and negotiation with partners, is pedagogically valuable because it takes coordination, continued attempt, construction and shared conception driving the iteration (Laurillard, 2012). In the collaborative learning process, learners share, discuss and build on the outputs of their peers or collaborative partners and negotiate and share meanings relevant to the problem-solving task at hand (Roschelle & Teasley, 1995). In the K-12 context, collaboration applies to techniques that emphasise student-to-student interaction in the learning process, as opposed to cooperation whereby students communicate and work in small mandated groups usually monitored by a teacher (McInnerney & Roberts, 2004). Dede (2010) recognised the shifting nature of collaboration, becoming a more sophisticated skillset where 21st century workers increasingly accomplish tasks through mediated interactions with peers halfway across the world with whom they may never meet face-to-face.

Garrison (2016) proffered that collaboration is fundamental to human nature, and cooperation does not have the shared influence and contribution to a task that collaboration does. In relatively early days for e-Learning and online collaboration, Harasim (2000) shared the principle of collaboration in learning as singularly important to the concept of online networked learning. In the context of this study, informed by the work of Piaget (1929) and Vygotsky (1978), collaborative learning makes use of interactive technologies, and combines the social and construction

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elements of the learning process (Laurillard, 2009), emphasising the importance of construction of a model or object. Typically, collaboration, in groups of 3-5 or up to 20 students in a group discussion, is constructivist when learners share, challenge and develop alternative viewpoints (Harasim, 2012). Lamenting the lost potential of the social brain through squandered classroom education, Mercer (2013) offered three complementary (not mutually exclusive) explanations of the effects of collaborative learning and dialogue on the development of children's reasoning. Boyd (2016) discussed these in the context of the K-12 classroom: 1) appropriation where my ideas plus your ideas equals our collaborative artefact; 2) co-construction where my ideas multiplied with your ideas equals a collaborative product that is greater than the mere sum of our separate efforts; and, 3) transformation such that changing the way a person thinks and interacts with others, offers opportunity for the transfer of skills.

Educator collaboration is culturally and contextually influenced, impacted by certain preconditions, making sustainability uncertain (Vangrieken, Dochy, Raes, & Kyndt, 2015). An overview of 82 studies showed that when educators collaborate, students progress educationally and schools undergo cultural changes to become more innovative while educators benefit the most from collaboration through improved morale and motivation, feeling less isolated with indications of a 'growth-mindset' taking place. Vangrieken et al. (2015) concluded that essential factors hindering educator collaboration included personal characteristics, such as: potential threats to autonomy, negative attitudes, and no training in how to collaborate; group characteristics, such as balkanisation, group pedagogical differences, lack of structure, ineffective leadership, and poor communication; organisational characteristics such as school culture of individualism and isolation, and lack of policies; and structural characteristics such as lack of time, and lack of structure within the school. Preconditions for collaboration required a supportive atmosphere, and adequate structure for teachers to actually collaborate, such as time release. In a later study, Vangrieken, Grosemans, Dochy, and Kyndt (2017) explored the complex relationship between collaboration and educator autonomy. They contrasted the older definition of autonomy as being educators' independence through isolation and alienation, with the more recent conception of educator autonomy that includes

collaborative decision-making and the freedom to make prescriptive professional choices. They also identified two autonomy attitudes, reactive and reflective, where the latter, being inherently intrapersonal, facilitates collaboration.

2.3.1.1 Online collaborative learning.

Terminology for learning that is online and potentially collaborative includes Computer-Supported Collaborative Learning (CSCL), telecollaboration, online collaborative learning, online global collaboration, and collaborativism. The lines are often blurred as to whether the online collaboration is local (within the same class or institution), or whether it is more global (between classes or institutions). As a paradigm shift, online collaboration as a norm reflects the needs of a digital and networked world (Lee & Ward, 2013) and by its very nature, affords learners of both synchronous and asynchronous modes to connect, collaborate and learn together, requiring key design and implementation skills of educators.

The 'challenge of orchestration', or in other words coordination of collaboration (Dillenbourg, Järvelä, & Fischer, 2009), emphasises interaction between students that goes beyond reacting to online material and towards learning through these interactions (Stahl, Koschmann, & Suthers, 2006). Computer Supported Collaborative Learning (CSCL) and how people can learn together with the help of computers emerged in reaction to learning in isolation dictated by early educational software design. CSCL prompted potential significant changes in schooling, teaching and learning and adoption of the educational frameworks of constructivism and project-based inquiry (Stahl et al., 2006). Core affordances of technology for collaborative theory and CSCL practice included engaging in co-construction, monitoring and regulating collaborative learning, as well as finding and building groups and communities (Jeong & Hmelo-Silver, 2016).

The theory and practice of Online Collaborative Learning (OCL) by Harasim (2012) is based on instructor-led online group learning in higher education and includes collaborative learning, knowledge building and the use of the internet while utilising a constructivist approach. Practically, OCL defines the educator as facilitator as well as an online community member and students collaboratively solve

problems through online discussion and interaction that is largely text-based and asynchronous. This aligns with the 'Online collaborative learning framework' by Redmond and Lock (2006) where the online learning environment shifts to encourage learners and educators as co-creators through interaction and collaboration. Harasim (2017) proffered the more recent version of Online Collaborative Learning (OCL) as 'Collaborativism' or 'Collaborativist' theory. By exploring the role of discourse as theorised by Vygotsky (1978), Collaborativism builds on constructivist learning theory and the use of the internet for collaborative knowledge creation where the role of the instructor is key (Harasim, 2017). de Sousa (2014) described Collaborativism as using social and cultural tools, usually Web 2.0 for communication, collaboration and co-creation practices, to construct knowledge.

The educator's role is critical for making a success of opportunities afforded by technology in online collaborative construction environments (Garrison & Cleveland-Innes, 2005; Laurillard, 2012). Callaghan and Bower (2012) studied Grade 10 students using the social network tool Ning (http://ning.com) where the educator was instrumental in engaging learning in an online learning environment. Casey and Evans (2011), also using a Ning, found students were able to take control of many aspects of learning and this supported the communities of practice model used in professional learning for educators.

2.3.1.2 Building online communities for collaboration.

Technology can connect or distance people, it can mediate cognition and collaboration and it is thoughtful application of technology that builds communities of learners to engage in collaborative thinking (Garrison, 2015). The connected learning community model shared by Nussbaum-Beach and Hall (2011) consists of a Professional Learning Community (local community), a Personal Learning Network (global network), and Communities of Practice which are disparate global groups or individuals with overlapping interests (a bounded community). Educators connect with these different networks using a variety of technologies in order to share visions, common goals and beliefs. These connections lead to new opportunities, and unique ways of gathering and contributing to knowledge development. Readiness and ability to contribute and collaborate within a connected community supports

professional learning goals and breaks the isolation of a teacher within a closed school environment.

Community building is a social activity and therefore a design challenge when creating online spaces to learn. Choi et al (2016) suggest it is important for younger generations to be exposed to global communities to develop global minds that are, what they call, R2C2: respectful, reflective, collaborative and creative. However, 'build it and they will come' is not a guarantee, and according to researcher and educator Riel (1996), online learning communities of practice require three elements: 1) balance between unity of work and balance of experiences; 2) observance that size of group relates to the purpose; and, 3) reflection and evaluation of work. Riel and Polin (2004) described three distinct but overlapping learning communities: task-based; practice-based; and knowledge based. Task-based communities are built around a common goal or task and usually exist for a short period of time and thrive on diversity, and shared perspectives. Collaborative task-based communities can leverage technology to work within a school, establishing new structures, or beyond school borders. Practice-based communities relate to the formation of a Community of Practice so that organisations can "leverage the learning power of community" (Lave, 1991, p. 9). Knowledge-based communities are characterised by a focus on production of knowledge as a collaborative effort amongst members. This knowledge is then shared within and beyond the community. New knowledge creations are made possible via technology platforms such as Edmodo, where facility supports cross-classroom communications and collaborations.

2.3.2 Online global collaboration.

Online global collaboration, as distinct from technology integration or online collaborative learning communities, is where global partnerships (referring to beyond the school and classroom) exist for the purpose of working and learning together on specific goals and for co-creating new knowledge (Lindsay & Davis, 2012). Key factors are the use of online technologies, design features of the collaboration as well as changes made in teaching and learning structures for all collaborative partners involved (Garrison & Cleveland-Innes, 2005). Online global collaborative learning is important for providing global community development that

supports interpersonal exchange, information collection and analysis and problem solving (Harris, 2001). In addition, opportunities to contribute, create and co-create with partners at a distance while fostering global digital citizenship skills (Lindsay & Davis, 2012).

Systems for acknowledging or addressing online global collaboration in education include the ISTE standards for technology integration. The refreshed standards for students (2016) include 'global collaborator', and the refreshed standards for educators (2017) include 'collaborator', with attribute 4c stating, "Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally" (ISTE, 2019). The Continuum of Global Education (CGE) presented by Cook, Bell, Nugent, and Smith (2016) as a way to enhance technology literacy and understanding of global collaboration, has parallels with the Taxonomy of Global Connection (Lindsay & Davis, 2012) (see Appendix 2), whereby educators can start at any level and be engaged in more than one level simultaneously through a global activity. The CGE provides a beginning level of 'Global awareness', and traverses five additional levels of 'Parallel activity', 'Shared data', 'Limited communication', 'Engaged collaboration' and 'Global contribution'. Level 4, 'Engaged collaboration' includes both synchronous and asynchronous communication between global learners while educators connect to design learning experiences that require students to collaboratively solve problems and communicate in real time. Some of the benefits of 'Engaged collaboration', as identified by Cook et al. (2016), include writing and speaking for an authentic audience, the application of technology skills, cross-cultural empathy, and the development of a global perspective. Level 5, 'Global contribution', includes the creation of digital content, informed by Bloom's taxonomy (Krathwohl, 2002), that will have a lasting global educational impact.

In response to the changing role of teaching and learning and in order to address societal changes to educator isolation in the classroom through the use of communication technologies, Riel (1993) envisioned a move towards global education and online collaborative learning. She facilitated online Learning Circles, which are communities of practice based on the development of computer-mediated-

communication where students and teachers work cooperatively around the world (Riel, 1994). The theory and practice of Learning Circles aligned firmly with the educational philosophy of Dewey, Piaget and Bruner in conjunction with broader objectives to shift from educator controlled learning to wider community, experiential and personalised learning through a socio-constructivist framework (Riel, 1994).

The Learning Circle model (Riel, 1994) for online global collaborative learning emphasised creating empathy between partners, planned outcomes, facilitation of information exchanges, and collaborative knowledge building through a circle 'publication' that could be a website, a book or some other artefact. The Learning Circle structure could be considered as one of the predecessors to the online global collaborative project, and although not always reaching an ideal level of connection and collaboration between members, continues to bring diverse classrooms together for global collaborative objectives. According to Riel (1994), outcomes for students include, "Deeper understandings of issues from multiple perspectives, increased sensitivity to multicultural differences, systemic awareness of social/global issues and cooperative team skills" (p. 232). And for educators, the need to communicate and collaborate with others beyond their immediate community using online tools is significant, such that, "[i]n survey results, teachers list their own professional development as one of the most significant reasons for continued participation" (p. 241).

2.3.2.1 Telecollaboration.

Tellecollaboration is an older term, still used today, essentially meaning the same as online global collaboration. The basis for the practice of telecollaboration is the theory of learning being social (Vygotsky, 1978). Social learning theory informs that learning is a social activity that is most effective when engaged learners create personally meaningful products (Wenger et al., 2002). One definition of telecollaborative learning provided by Sadler and Dooly (2018) is "an embedded, dialogic process that supports geographically distanced collaborative work through social interaction, involving a/synchronous communication technology so that participants co-produce mutual objective(s) and share knowledge-building" (p. 236).

Earlier on, Harris (1999), university professor and former classroom teacher, defined a telecollaborative activity as "an educational endeavour that involves people in different locations using internet tools and resources to work together" (p. 55). Telecollaboration 2.0 evolved in the late 1990s, according to Guth and Thomas (2010), when networked based language learning opened up new opportunities for telecollaboration using Web 2.0 tools in online collaborative projects to improve language skills, intercultural understanding and digital literacy. Drawing a distinction, Harris (2002) defined telecooperation as building something separately during the same time period, whereas telecollaboration was building something together at the same time and is more difficult to implement and facilitate due to lack of teacher time and differing school schedules (Harris, 2002).

A Delphi study by O'Dowd (2015) explored skills and attitudes needed for designing, implementing and collaborating and attempted to develop a framework for telecollaborative competencies in educators to support language teaching. He defined telecollaboration or Online Intercultural Exchange (OIE), as "the application of online communication tools to bring together classes of language learners in geographically distant locations with the aim to develop their foreign language skills and intercultural competence through collaborative tasks and project work" (p. 194). The Delphi study concluded with the essential competencies of a tellecollaborative language educator being organisational, pedagogical, technological, and adopting appropriate attitudes and beliefs. A broader overview of telecollaborative goals and practices emerged through another study by O'Dowd (2016) who reviewed 20 years of telecollaborative practice in post-secondary learning. This practice had gone under names such as OIE, Virtual exchange, Collaborative Online International Learning (COIL), Internet-mediated Intercultural Foreign Language Education, and e-Tandem or Teletandem. As telecollaboration neared the end of the third decade (since the internet became readily available for education) O'Dowd noted some changes in approach and activity design through the data. These included 'critical telecollaboration' that attempted to include genuine engagement rather than superficial exchanges of diversity and 'cross-disciplinary telecollaboration' that engaged students beyond foreign language and across other disciplines.

A survey in August-October 2001 of 101 projects posted to the HiLites list, a defunct, once popular moderated K-12 global project announcement email list sponsored by The Global SchoolNet (http://www.globalschoolnet.org/gsnpr/hilites.cfm), revealed a lack of telecollaboration and demonstrated the most popular telecommunicative activities involved students doing activities in class or in their local community and sharing back to the project, not between or across classes (Harris, 2002). The least popular telecommunicative activities required "interaction online between or among participating classrooms, often for an extended period of time…[and]…active and ongoing coordination to be successful" (Harris, 2002, p. 4). Although lamenting the low level of telecollaborative activities Harris concluded they should gain traction, "[i]f superior educational benefits for telecollaborative learning activities are perceived clearly by teachers making instructional choices on behalf of or with their students, telecollaborations will flourish" (p. 6).

Previously, Harris (1995) advised that educators must plan and structure the telecollaborative activity to ensure successful learning takes place and advocated a growing number of activities within structured genres - interpersonal exchanges, information collections, and problem-solving projects. The activity structure of 'Global classrooms' came under the genre of Interpersonal exchanges, and described the learning process emphasis as "Longer-term, group-to-group discussion-by-writing of structured or semi-structured topics" (Harris, 2001, p. 5). The book, 'Virtual architecture: Designing and directing curriculum-based telecomputing' (Harris, 1998) published by ISTE, provided an extensive guide for K-12 as well as teacher educators to hone in on how to use online tools and resources in conjunction with project based learning in elementary, middle and secondary classrooms. In many respects the book was ahead of its time, with a clear focus on designing for purposeful 'activity structures' or flexible frameworks adaptable and applicable to numerous telecollaborative learning situations.

2.3.2.2 Global projects in K-12.

Pertinent research sharing the practice of implementing global education and global projects into the K-12 learning environment spans nearly three decades (Choi

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et al., 2016; Cook et al., 2016; Duggleby & Lock, 2018; Espino, 2018; Gouseti, 2012; Leppisaari & Lee, 2012; O'Connor & Hite, 2017; O'Neill, 2007; Oran, 2011; Reimer, 2012; Riel, 1994; Smirnova & Ivushkina, 2013; Smith, Cheon, Jabri, Reynolds, & Zebedi, 2012; Stornaiuolo, 2016; Wells, 2007). Additionally, research has also focused on the use of social media and Web 2.0 to make global connections (Arteaga, 2012; Greenhow & Robelia, 2009; Oran, 2011) and learning through the use of social media (Casey & Evans, 2011). These examples revealed what is possible and highlight those who are already embracing online technologies to connect within and beyond the classroom. Global projects varied from one-on-one classes through individual teacher initiatives, to organised classroom groups coming together for a more sustained curriculum purpose. This included ongoing organised communities such as iEARN (https://iearn.org/), eTwinning in Europe (https://www.etwinning.net/en/pub/index.htm), and GlobalSchoolNet (http://www.globalschoolnet.org/). Global education experiences ranged from K-12 through to higher education collaborations designed to foster global awareness and online collaborative learning in educators.

Increased access to the internet and the development of telecommunication-based global collaborative projects and activities by schools in Australia prompted Wells (2007) to research the type of learning that was taking place through two case studies. These were iEARN (http://iearn.org) and the Global Classroom (http://www.whalesong.org/literature/9601.html) and research outcomes described key collaborative online projects associated with these. Features of these global projects included authentic learning and real audiences, student-centred learning, and design that accommodated learning styles, cultural differences and different language backgrounds. Wells also referred to the use of online technologies to facilitate communication and made an important distinction between contributory participation as compared to collaborative participation. Global projects that involved contributory participation occurred when students and the educator sent material to the product facilitator and received a group product at the end. Collaborative global projects are more integrated where students communicated regularly and/or had a major role in developing the final product. Development of a CoP and/or learning community around the global project resulted in higher levels of

collaboration. Interestingly Wells (2007) stated, "Interactive technologies encourage active learning and, with the increased popularity of computers, today's students are learning with technology, as opposed to learning about technology" (p. 670).

Research by Oran (2011) on educators engaged in telecollaborative projects through the iEARN network found that they framed a conceptualisation of global education around their own experiences and values and around students' needs and experiences. Although educators lacked formal preparation for global learning they integrated global education into their classrooms because of their personal commitment to it, and in spite of a lack of formal curriculum. The study of elementary level students connecting between two countries by Leppisaari and Lee (2012) revealed that challenges to online global collaboration included varying conditions that exist in respective schools, systems and countries; cultural differences impacting communication styles; interruptions in the timeline affecting completion of agreed outcomes; and, the attitudes and habits of individual educators making collaboration successful, or not. Reimer (2012) researched a high school Spanish class using blogs where the teacher organised 'penpals' with a Spanish speaking country. He described two main engagements from students who enjoyed the experience: 1) being able to communicate in Spanish; and 2) having a real experience with a real Spanish speaker. Challenges included partners who did not respond, communication issues and some technical issues.

The International Virtual Elementary Classroom Activities (IVECA) (http://website.iveca.org/virtual-classroom/) was established to equip USA public school students in becoming capable global citizens through direct action with other cultures (O'Neill, 2007). Research on the outcomes of intercultural virtual exchanges revealed changes in students' cultural awareness and intercultural skills, how interaction between participants supported this, and how school systems can further support this. Conclusions highlighted the key barriers to global collaboration in learning as time to implement, access to technology, and training for educators, particularly in the use of technology. In another research project, Stornaiuolo (2016) examined educator participation in global collaboration from a facilitation of intercultural conversations perspective. Conclusions shared how important it is for

educators to be supported by appropriate technologies, and with skills for mediating 'cosmopolitan' collaborative conversations while online.

2.3.2.3 Design and facilitation factors.

In a 21st century learning environment design of online learning is a challenge that requires structure and leadership (Garrison & Cleveland-Innes, 2005) and educators need to work collaboratively to design and facilitate effective and innovative teaching (Laurillard, 2012). As part of the paradigm shift in teaching and learning students must be able to learn with and from each other anytime and anywhere in the world and build knowledge collaboratively beyond the one-time event (Lock, 2015). Design of collaborative learning is important to bring the world into the classroom (Choi et al., 2016; Harris, 1995, 2001; Lindsay, 2016; Lindsay & Davis, 2012; O'Neill, 2007; Redmond & Lock, 2015; Riel, 1994); to support inquiry and critical thinking for global awareness and global competency (Duggleby & Lock, 2018); to develop student understanding of who they are as global citizens through authentic learning (Lock & Duggleby, 2017; Wells, 2007); and, to foster co-creation through collaborative learning experiences (Lindsay, 2016; Lock & Duggleby, 2018). The research into K-12 global collaborative learning by Duggleby and Lock (2018) focused on design of learning to support inquiry and critical thinking, emphasising educators as designers of new learning experiences. These designed experiences promoted enhanced communication and collaboration across geographic distances; provided safe and trusting learning environments to do this; and, embedded extended, interdisciplinary learning across borders through leadership, planning and educator skill development. The case study research investigated the phenomenon of how a seven-week online international collaborative project between Canadian and Peruvian Grade 3 students fostered deep inquiry of the curricular topic and engaged learning through online interactions (Duggleby & Lock, 2018). In conclusion, Lock and Duggleby (2018) provided recommendations for future global educator designers that included observance of authentic and intentional learning, allowing time for planning and implementation, intentional selection of digital technology, and development of educator capacity for collaborative pedagogy.

Research by Lock (2015) into the paradigm shift of education and the online global classroom concluded that teacher capacity to design and implement learning for a global-ready classroom requires a philosophical shift to constructivist learning as well as development of new practices for delivering instruction. Above all, educators need guidelines to design global collaborative learning experiences and move from a singular learning experience, which is often synchronous. A framework, based partly on guidelines from Manso and Garzón (2011), was developed to help teachers design and facilitate global collaborative learning experiences that included observance of: the nature of the inquiry; the intentional integration of ICT; design and facilitation for collaboration; and intentionality of interaction (Lock, 2015).

2.3.2.4 Online global collaboration and educator training.

Educator training and how educators potentially learn to collaborate globally through tertiary level courses is a consideration in this study as the results may inform new approaches in teacher education. Although an older study, Hawkes and Good (2000) researched the impact on professional development of three online global telecollaborative projects. Designed for grades 4-10 most participants lived in rural communities in the USA. Communication during the projects was asynchronous, using email and listservs to connect with scientists and access project material online. Findings by Hawkes and Good (2000) included the benefits to educators from communication online with peers at great distances, access to expert perspectives, improved roles and opportunities as instructional leaders and realisation of the high workload prompting several teachers to rethink their willingness to continue. Educators were motivated to collaborate because they believed online global collaboration engaged student interest in the world around them, however they became frustrated with technology limitations and needed PD support, time to experiment and not to be under standardised testing pressure.

As a training ground for pre-service educators the research by Smith (2014) examined how online global projects supported the learning and use of new technologies, interaction with veteran educators in distant locations, and practise of a global perspective. An activity was designed whereby in-service educators acted as

mentors for the pre-service educators in an active global project-based learning activity called 'Monster Project'. Results suggested a number of benefits included understanding how to actively participate with colleagues beyond the immediate classroom, and how to build a network of colleagues for future collaborations. Another outcome for participants was experience with interdisciplinary project-based learning aligned with constructivism (Smith, 2014). Implementing global projects into teacher education coursework, and building connections with mentor teachers was shown to be valuable for gaining new pedagogical knowledge through the online collaborative experience.

Applying the 'Online collaborative learning framework' (Redmond & Lock, 2006) to the design and implementation of an international online collaborative learning experience between two pre-service teacher classes in Canada and Australia, Lock and Redmond (2009) demonstrated the possibilities of global collaboration. The culmination of the collaboration, or 'knowledge in action' led to students presenting personal action plans at a synchronous online meeting, and writing critical reflections. Final recommendations for online global collaborative learning in teacher education included new design features to align assessment with activities, and provision of more time for participants to work collaboratively together. In a recent doctoral study, Espino (2018) focused on challenges to and best practices of online global collaborative learning from the perspective of educators. Two practical takeaways for developing global collaboration were constructed from the research findings: developing a global collaboration toolkit; and, recognition of dimensions of leading global collaboration to include educator responsibilities and characteristics.

2.4 Pedagogical and Dispositional Challenges to Online Global Learning

Pedagogy originated from the Greek words *paid* meaning child and *agogus* meaning leader of, and literally means the art and science of teaching children (Samaroo et al., 2013). Traditionally, pedagogy implies students are in a submissive role and assumes they only need to learn what the teacher teaches and therefore may be the barrier to better understanding of education practices, both current and

emerging as 'to lead the child' does not align with contemporary use. Beetham and Sharpe (2013) suggest we need to 'redo' and 'rethink' pedagogy and move towards reinstatement of the 'learning' side of pedagogy such that learners are active participants in the learning process. As part of educator evaluation of the impact of pedagogical choices on their learners, perhaps the term 'design' is more apt to rethink pedagogy in the digital age where 'design for learning' is the preferred term.

The next section of chapter 2 explores research into educator beliefs and mindsets that may have influenced pedagogical approaches and examines research related to emerging pedagogies using digital technologies, including a focus on global collaborative learning.

2.4.1 Educator beliefs about teaching and learning.

Research related to educators as agents of change, qualities of and conditions for implementing online global collaborative projects using ICT, and pedagogical beliefs showed that barriers to technology integration not only included hardware and software issues but also beliefs and attitudes (An & Reigeluth, 2011; Arnell, 2014; Bai & Ertmer, 2008; Davies & West, 2014; Ertmer et al., 2012; Kale & Goh, 2014; Kim, Kim, Lee, Spector, & DeMeester, 2013; Laurillard, 2009; O'Dowd, 2015; Orlando, 2013; Owston, 2007; Palak & Walls, 2009; Scardamalia & Bereiter, 2006; Somekh, 2008; Zhao, Pugh, Sheldon, & Byers, 2002). Educator beliefs about teaching and learning play an important role in transforming classrooms through the use of technology (Ertmer, 1999, 2005; Ertmer & Ottenbreit-Leftwich, 2010). Ertmer (2005) examined whether increased and prolonged technology use prompted a change in practice, and pedagogical beliefs, while Bai and Ertmer (2008) explored how second order barriers, being beliefs and attitudes, may determine technology use in the classroom. The facilitation of positive attitudes towards technology was found as necessary for success, whether at the pre-service or in-service levels. Davies and West (2014) found educators believed technology can improve instruction and facilitate learning, and also that students need to develop digital literacy skills to become productive members of society in a competitive global economy.

Exploring K-12 educator beliefs, practices and barriers related to a technology-enhanced, learner-centred classroom, An and Reigeluth (2011) interviewed 126 educators and found they held positive beliefs in the need for technology in learning. Most, 98%, believed their attitude toward learner-centred instruction was not a barrier however, despite beliefs, changes in classroom implementation may not be happening (An & Reigeluth, 2011). A multiple case study research design employed by Ertmer et al. (2012) examined similarities and differences among pedagogical beliefs and technology practices of educators using emerging technologies. The research question was, "How do the pedagogical beliefs and classroom technology practices of teachers, recognized for their technology uses, align?" (Ertmer et al., 2012, p. 423). Research data was provided by twelve purposefully selected award-winning educators, from the USA and Canada, who had online evidence of technology integration via blogs and other platforms and who were willing to share beliefs and practices. Results suggested the biggest impact was educator beliefs and attitudes about the relevance of technology to student learning. Further to this, educators who had student-centred beliefs implemented student-centred pedagogy despite technological, administrative, or assessment barriers and most educators indicated attitudes and beliefs of colleagues as the biggest barrier followed by lack of administrative support and state testing (Ertmer et al., 2012). In terms of enablers, educators self-identified their own beliefs and attitudes, or knowledge and skills as the strongest contributing factor to successful technology integration, followed by professional learning networks such as Twitter and blogs.

A 5-year longitudinal study by Orlando (2009) revealed that educators' core beliefs about learning were not constructivist and had not changed in expected ways due to the use of ICT (Orlando, 2013). This research was on 'ordinary' educators in the classroom, not 'tech-savvy' early adopters. Findings informed that educators were not making use of ICT in ways that were 'constructivist' but still used ICT to support the development of knowledge construction important to modern society. The goal of constructivism may not be achievable given that a didactically generated curriculum allows for technology use in the classroom, but does not encourage educators to change their beliefs. Educator beliefs that inform practices can be seen

as a continuum where information transmission and constructivism are at extreme ends (Orlando, 2013).

A study on educator beliefs and practice by Palak and Walls (2009), in relation to working in a technology-rich school, found that availability of technology did not of itself change teacher-centred practice and that professional learning needed to focus on student-centred pedagogy. Smith, Moyer, and Schugar (2011) challenged beliefs of graduate and practising educators about the use of ICT and whether these would shift (and in which way) based on a short global learning project. This research uncovered that familiarisation with new tools and embedding teacher learning into an existing program does start to shift attitudes and increase confidence with online learning. Arnell (2014) researched educator participation in communities of practice, specifically Classroom 2.0 and Flat Connections and how educators' beliefs on personal learning and collegial collaboration impacted this participation. She found that being co-learners in a virtual community encouraged self-directed, open-minded and reflective dispositions, engagement in ongoing inquiry and exploration of new ideas. Participants in virtual communities already had ideas about learning conducive to connecting and collaborating and had formed beliefs that influenced their participation in virtual communities before the opportunity to join online communities was possible. Although beliefs did not change, their newfound virtual community participation broke through isolation and allowed them to extend their learning and frame ideas around new opportunities and reflection on pedagogical practices (Arnell, 2014).

2.4.2 Mindsets.

A mindset is described as: an attitude and a mental model fuelled by beliefs and values, that can be either positive or negative (Duffy, 2009); a worldview including personal philosophies, ideologies and values (Siemens & Tittenberger, 2009); ways of thinking (Harris, Mishra, & Koehler, 2009); and reflective of psychological insights (Subramaniam, 2007). The non-neutrality of technology, and the cognitive effects of different technologies, such as Web 2.0 and the change towards flexibility and connectivity, fosters different mindsets or ways of thinking (Harris et al., 2009). Educators and organisations create mindsets around existing paradigms that can

become very rigid and are often reluctant to change or do things that do not align with the current mindset, hence a key reason why innovation and 'out of the box' thinking is resisted (Duffy, 2009).

In the context of effectively employing learning technologies to improve learning opportunities, Veletsianos (2016) stated how it takes a critical mindset to "counter simplistic assumptions about design, pedagogy, and the role of technology in education" (p. 255). An educators choice of tools for learning (such as open tools like blogs and wikis compared with a closed tool such as a school-based LMS) reflect an existing mindset (Siemens & Tittenberger, 2009). The concept of 'augmenting classrooms' (Siemens & Tittenberger, 2009) allows educators to integrate new technology tools into existing teaching activities at a pace relative to personal comfort level, with an 'all or nothing' mindset not helpful. An and Reigeluth (2011) suggested the paradigm change needed in education to a technology-enhanced, learner-centred classroom requires helping all stakeholders "evolve their mindsets about education" (p. 61), and recommended future research explore ways to do this. In line with this, Nussbaum-Beach and Hall (2011) recognised that shifts in beliefs about learning foster a new mindset where global interaction leverages communication technologies. Research by Sadler and Dooly (2018) revealed how implementation of telecollaboration for language teacher education changed the mindset and roles of both educators and students, such that this practice is now core to the program, not as an add on.

2.4.2.1 Types of mindsets.

Psychologist Carol Dweck (Dweck, 2006-2010) introduced the concept of mindsets as a set of personal beliefs related to qualities such as intelligence, talents, and personality. She contrasts what she calls 'fixed mindset' with 'growth mindset' (Dweck, 2006). A person with a fixed mindset believes their basic qualities are fixed traits and that talent alone creates success, and in contrast, a person with a growth mindset believes abilities can be developed through dedication and hard work. Originally focusing on younger students, Dweck (2015) stated, "We found that students' mindsets - how they perceive their abilities - played a key role in their

motivation and achievement, and we found that if we changed students' mindsets we could boost their achievement" (p. 1).

Another approach taken by Klein (2017) is the 'deficit' and 'asset' mindsets found in educators. An asset mindset allows educators to approach global connections with empathy and the expectation of equality between partners, with every external connection providing opportunity and new understandings. The context is to guide global educators in avoiding the deficit mindset pitfalls of 'learning about' and 'solving for' global partners in favour of maintaining an asset mindset 'learning with' and 'solving with', while breaking through stereotypical attitudes about others (Klein, 2017).

According to Gupta and Govindarajan (2002) the concept of a mindset is based on cognitive psychology and more recently, organisational theory, "Our mindsets are a product of our histories and evolve through an iterative process. Our current mindset guides the collection and interpretation of new information" (pp. 116-117). Although writing in a business context, Gupta and Govindarajan (2002) defined a global mindset as "one that combines an openness to and awareness of diversities across cultures and markets with a propensity and ability to synthesise across this diversity" (p. 117). Beechler and Javidan (2007) described the critical components of a global mindset as intellectual capital, cognitive capital and social capital and refer to aspects of cosmopolitanism important to a global mindset, including openness. In an education context Snyder (2016) found a global mindset needs to be coupled with skills in social media and global collaboration in order to prepare for the future and become productive digital citizens.

Interestingly, 'global mindedness' as discussed in the OECD PISA Global Competence Framework (Piacentini, Barrett, Mansilla, Deardorff, & Lee, 2018), referred to having a key disposition to global competence. The framework informs that globally minded people "care about future generations…[and]…exercise agency and voice with a critical awareness of the fact that other people might have a different vision" (p. 16). In addition, employing thinking routines such as 'to inquire

about the world', and 'to understand multiple perspectives' cultivate student global dispositions (Mansilla, 2016).

2.4.3 Pedagogical practices.

As the internet became more prevalent in classrooms, Garrison and Anderson (2003) wrote about context and process being attended to in order to achieve quality education. They inquired into how networks and interactive pedagogies positively address the quality of the learning experience. Spires, Wiebe, Young, Hollebrands, and Lee (2012) suggested in the new learning ecology that educators make a pedagogical shift to accommodate learning that is continuous, changing, and values the individual nature of each learner. Defining new pedagogies as powerful models of teaching and learning between and among students and educators, Fullan et al. (2014) claimed the pedagogies revolve around three essential constructs: new learning partnerships; deep learning tasks; and digital tools and resources. In conjunction with this, pedagogical capacity, an educator's repertoire of teaching strategies and partnerships for learning, has and will continue to change as technology becomes more pervasive to include content delivery and consumption as well as collaboration and creation of new knowledge with a focus on the process of learning.

The concept of a 'digital pedagogy' is defined by Kivunja (2013) as "the embedment into the art of teaching, computer driven digital technologies, which enrich learning, teaching, assessment and the whole curriculum" (p. 131). This contrasts with the definition provided by Hybrid Pedagogy (2018), whereby digital pedagogy is not about using tools for teaching but a pedagogical approach around the choice and impact of digital tools. Furthermore, Critical Digital Pedagogy demands that open and networked educational environments must not be merely repositories of content but instead, platforms for engaging students and teachers as full agents of their own learning (Stommel, 2014). The premise here is that learning is not knowledge building and not about transmission of facts, rather, it is about construction of understanding and building of knowledge through contributing to ideas, bouncing ideas and facts off each other (Scardamalia & Bereiter, 2006; Skillen, 2015). The driving force of knowledge building pedagogy and supporting

technologies is cultivating an interest and motivation in students to connect with society beyond the classroom to contribute to knowledge creation. Knowledge building is visible in places like online discussion forums where interaction between students and collective efforts show development and progression of ideas (Scardamalia & Bereiter, 2006).

2.4.3.1 Signature pedagogies.

The concept of 'signature pedagogies' (Shulman, 2005) references higher education however they also relate to the K-12 context of this research. Signature pedagogies are "the types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions" (p. 52). Individual professions develop their own signature pedagogies, and although varying in practice across the disciplines are used to prepare scholarly practitioners to "think, perform and act with integrity" (p. 52) in their professional domain. Shulman (2005) further posits the three signature pedagogical dimensions of instructional strategies are surface, deep and implicit structures, and signature pedagogy identifies a discipline's habits of the 'mind' (content), habits of the 'hand' (skills) and habits of the 'heart' (values).

In order to determine signature pedagogies of social studies and technology integration, Beck and Eno (2012) analysed 121 books, articles and conference proceedings. They found two instructional modes of direct instruction and also a student-centred, inquiry-based approach, constituted the signature pedagogy found in social studies education. They also found a dichotomy whereby social studies organisations expound goals for education to develop competent and engaged citizens, whereas the research revealed many educators preferred to take a direct instructional pedagogy due to lack of training or understanding to implement a student-centred approach (Beck & Eno, 2012).

In another study by Eaton et al. (2017) signature pedagogies were described as "the approaches in designing and assessing learning for an online community of inquiry that are fundamental to the discipline and related professions in the field…[and]…whether they are surface, deep or implicit, implementing a signature

pedagogy should be for the benefit of all learners" (p. 16). With the goal of providing a preliminary common language for signature pedagogies related to educator professional development, Parker, Patton, and O'Sullivan (2016) offered three signature pedagogies that enhanced educator growth and learning and described how educators learn as collaborative and inquiring professionals, namely: critical dialogue; public sharing of work; and engagement in communities of learners.

The work of Mansilla and Chua (2017) extended the notion of signature pedagogies, defined as "a pervasive set of teaching practices that nurture students' capacity and disposition to understand and act on matters of global significance" (p. 6), to K-12 environments and particularly to global education. They presented two signature pedagogies: 'research expeditions', also known as 'travel pedagogy'; and 'purposeful comparisons'. Research expeditions support learner experience of a different place and culture through developing a personal connection, an opportunity not normally found through a textbook. Purposeful comparisons examine a single phenomenon holistically, inquiring into similarities and differences to inform understanding.

2.4.4 Pedagogies for collaborative and global learning.

The focus of this study is educator development of pedagogical skills and attitudes facilitating online global collaborative learning experiences. Skills and attitudes inform new pedagogies leading to pedagogical change that may take place to accommodate new learning modes that are online, collaborative and global. This relates to how participatory and socio-technical practices leading to online global collaboration and adoption of innovative pedagogies support a paradigm shift in teaching and learning (Facer, 2011).

A distinction is drawn between collaboratively usable applications and collaborative technology in the research around instructional and pedagogical approach to collaborative technology by Lipponen and Lallimo (2004). A criterion for collaborative technology includes its design being based on a theory of learning or pedagogical model and that it offers representational and community-building

tools. However, for this research it is the collaboratively usable technologies that have emerged in the past ten to fifteen years that will likely support the collaborative pedagogical focus. Laurillard (2009) argued that an enhanced learning experience can come from the use of collaborative technologies and asked, "How can we ensure that pedagogy exploits the technology and not vice versa?" (p. 6).

One of the leading institutions in education, the International Baccalaureate, has developed and shared pedagogy for learning and teaching to develop knowledge, skills and attitudes with an international perspective. Former IB leader, Ian Hill, defines key educational needs as lifelong learning, learning to live together and values education (Hill, 2007). Implications for pedagogical approaches to global learning include learning how to treat global issues through multiple perspectives, understanding how to facilitate effective group work and collaborative learning and how to utilise the internet to support all objectives (Hill, 2007).

2.4.4 Pedagogical change.

Recent moves to redefine or transform learning using technology (Fullan et al., 2014) begin to explain and support what educators are doing and need as a structure for connecting and collaborating globally, but there is much more to consider. The challenge is how to leverage the unique opportunities provided by technology, especially Web 2.0 online technologies, rather than to replicate face-to-face learning experiences, keeping in mind technology integration redefines the learning task as a techno-constructivist approach (McKenzie, 2004). This has implications for supporting teacher pedagogical change removed from technology integration being an isolated goal (Ertmer & Ottenbreit-Leftwich, 2013).

According to McLoughlin and Lee (2010), pedagogical change requires knowledge of appropriate teaching methods and awareness of the learner experience while using Web 2.0 technologies and social media. Laurillard (2012) reminds that a wiki can be pedagogically ineffective if it does no more than replicate a publishing environment. Users of the wiki need to read beyond their own pages not inhibited from changing what others have written, contribute beyond set school hours, and ultimately feel ownership of the product (Wheeler, Yeomans, & Wheeler, 2008). The

wave of technologies in schools including new relationships between humans and technology over the past 20 years (Facer, 2011) has supported pedagogical change in learning including the capacity to allow for sharing ideas and learning from and with a worldwide community and a more participatory experience with customised outcomes by the participants (Davidson & Goldberg, 2009).

Research has identified the impact of ICT on educator practices and the need for change to engage students through online learning (An & Reigeluth, 2011; Arnell, 2014; Hew & Brush, 2007; Lock, 2015; Orlando, 2009; Sadler & Dooly, 2018). Research has also shown that educators are not changing in the expected constructivist direction through the use of ICT (Fullan et al., 2014; Orlando, 2013; Somekh, 2008). The advent of new technologies in the classroom has not necessarily changed pedagogy. Sustainability of innovation by educators using technology relies on their enthusiasm and skill and external factors in place, such as a supportive community (Arnell, 2014; Arteaga, 2012; Owston, 2007). A dispositional shift can accompany a very brief and limited ICT-based learning experience embedded within existing programs (Smith et al., 2011). The use of ICT for teaching and learning, according to Somekh (2008), depends on the "interlocking cultural, social and organisational contexts in which they work" (p. 450), and that "ICTs, when used in ways that make use of their affordances, are a powerful driver for change" (p. 458).

Implications for technological and pedagogical change were described by Lock (2015) in the context of learners able to work in the global classroom, and educators enabled through pedagogical shifts to now design rich learning for global collaborative landscapes. Lock informs three key implications or drivers of this paradigm change: 1) The understanding that having the technology infrastructure does not guarantee global learning will occur - processes and policies must be in place, along with educator empowerment; 2) A pedagogical shift is required to ongoing, sustained conversations and collaborations as part of the knowledge-building experience; and, 3) Educator capacity needs for design and facilitation of collaborative learning in the global classroom must be built, requiring "greater understanding of what is a global classroom and how it can inform global perspectives" (p. 151). In addition, Lock advises that achieving this paradigm change

may need adoption of constructivist learning theory and design of new instructional approaches.

New pedagogies have emerged through learning partnerships, real-world local and global collaboration and putting control in the hands of the students (Fullan et al., 2014; Wang, Hsu, Reeves, & Coster, 2014). The research of John Hattie, as shared by Fullan et al. (2014), reveals a new pedagogical role for educators as 'activator', impacting educator-student relationship, reciprocal teaching, and feedback. Moving from hierarchical to networked learning that is end user driven (Siemens, 2006a) allows educators to become knowledge conduits, not containers. Therefore it is of consideration here as to how online learning spaces, tools and pedagogical approaches support this change, informing how educators learn to work online with students.

2.5 Justification of the Research

The focus of this study was to investigate online global collaboration and elements contributing to educator readiness and ability to implement this in the K-12 classroom. It aimed to extend existing research to K-12 educators who implement online global collaborative experiences in order to explore the impact on their respective pedagogies. It focused on learning supported by online global collaboration in the areas of educator belief about pedagogy and technology, educator professional learning approaches, and educator conceptual change. Investigation of pedagogical change was through a case study approach with a phenomenological lens for lived experiences.

Although research has highlighted positive learning outcomes through innovative use of technologies and global collaborative learning constructs for students, clarity is required around why educators are not adopting these practices more widely and more frequently. The literature particularly focuses on learning outcomes of online collaboration for the student, structural organisation including barriers and enablers for global learning and uses of particular technologies to connect within and beyond the classroom. The literature on collaborative learning and on using technology to connect learners does not include a focus on the educator

making pedagogical meaning of their online global collaborative experiences. There is apparently little research available on the attitudes, beliefs and practices of educators who are reshaping their classroom experiences (real and virtual) and adopting new pedagogies for online global collaboration and co-creation with global partners. Narratives from educators found in current research, in conjunction with my personal experiences, show a gap in academic knowledge to do with how educators implement online global collaboration in the classroom and the influence that online global collaboration has on educator pedagogical change. There is also a gap in the research on the educator as pedagogue to reveal what beliefs and practices support global collaborative learning and what impact this learning approach has on their evolving pedagogical understanding and priorities.

Through a K-12 lens much of the research has been on 'learning technology' - the role of technology in facilitating, supporting and enhancing the act of learning, how learners learn, technology integration, Web 2.0 tools and learning modes, as well as limitations of the learning environment when using technology, and when using online learning modes. Selwyn (2010) encouraged researchers to give greater acknowledgement to the influences of educational technology above and beyond the context of the individual learner and their immediate learning environment. Although research has highlighted the importance of educator beliefs in teaching and learning the focus has largely been on technology integration. The study by Ertmer et al. (2012) on tech savvy educators included some focus on global collaboration, while the work of Lock (2015), Oran (2011), Redmond (2011), and Wells (2007) amongst others focused on aspects of global collaborative learning that are not aligned with the pedagogical focus of this study.

The real gap in the literature is the lack of research on K-12 educators' personal beliefs and pedagogies for implementation of online global collaborative learning, and the potential for transforming teaching and learning. There is little research on what competencies, beliefs, mindsets and practices educators adopt in order to overcome situational and dispositional barriers to implementing online global collaboration in the classroom. In addition, once again not found in the published research, is the focus of this study on the advantages to educational practice of online

global collaboration, or a model for other educators to adopt in preference for a longer-term shift in practice.

2.6 Summary

This chapter reviewed literature through the lens of three major themes. These were: 1) Theoretical background to learning approaches, teaching and learning with technology; 2) Collaboration and learning: local to global practices, and, 3) Pedagogical and dispositional challenges to online global learning. These themes aligned with the three supporting research questions to do with: 1) educator experiences around online global collaboration implementation in terms of collaborative and online learning knowledge and abilities; 2) educator beliefs about learning and teaching and the influence of these on online global collaborative practices; and, 3) educator enabling pedagogical approaches. A clear justification for the research shows there is a gap in the literature to do with educator personal beliefs and pedagogies and the possible transformative potential of online global collaborative learning in the K-12 classroom.

The next chapter reveals the research methodology in terms of theoretical underpinnings, research paradigm, methodological approach, and ethical issues.

CHAPTER 3 - METHODOLOGY

3.1 Overview

The literature review in Chapter 2 revealed a number of research challenges around educator experience with, beliefs about, and pedagogical approaches to online global collaboration. This study is a post-positivist, interpretive piece of research that employs constructivist and constructionist approaches to find meaning. Chapter 3 explores the theoretical underpinning, research paradigm, and methodological approach taken for the research. Methodology refers to the stance I have taken as a researcher (Evans, Gruba, & Zobel, 2014) and includes the research method and specific techniques employed for research design, data collection and data analysis strategies. Ethical issues and procedures pertinent to this research are also discussed.

3.2 Introduction to the Research Problem and Research Questions

The purpose of this research is to address the main research question and explore the influence of online global collaboration on pedagogy in the classroom. The experiences and approaches of K-12 educators were explored in order to analyse how these influenced beliefs about and engagement with online global collaboration in the classroom and the impact this might have had on personal pedagogy. As an online global collaborative educator, I was interested in particular skills, attitudes, conditions and habits of learning educators adopt and work with that make it possible for them to implement online global collaboration, and thereby determine if and how they shifted their pedagogical approach in relation to these experiences.

The context and scope of this research was global with K-12 educators from different parts of the world invited to share experiences and practices around online global collaboration in their classroom. Given my background as a leader in online global collaborative learning, it was important to me that I researched educators who connect regularly with others beyond their immediate learning environment and who thereby garnered understanding of and experience in online collaborative learning. Research is limited in the area of pedagogies that support online and global

collaborations, especially in the K-12 context, and this study was designed to support this objective as well as start to fill the gap in the literature.

Online global collaboration broadly refers to the activities of geographically dispersed learners who use open online technologies to connect, communicate and co-create with others beyond their immediate environment. This includes educators who use online technologies to connect and learn collaboratively with others beyond their immediate geographical environment in order to support curricular objectives, intercultural understandings, critical thinking, as well as personal, social and ICT capabilities.

In order to better understand what may be happening regarding educator practice through the implementation of online global collaborative experiences, the main research focus question was: How might online global collaboration influence educators' pedagogical approaches?

Supporting this overarching question, three sub-research questions provided a structure for deeper understanding of the research problem:

RQ1. What are the experiences of educators who implement online global collaboration?

RQ2. How do educators' beliefs about learning and teaching influence their engagement in online global collaboration?

RQ3. In what ways do educators' personal pedagogies enable online global collaboration?

3.3 The Researcher in the Study

The research in this study was concerned with real experiences taking place in K-12 education where educators and students are connecting beyond the immediate classroom for collaborative learning. In the past 20 years, my experience with global learning and online global project design and implementation has afforded recognition as an early adopter and thought leader by researchers, educators, and education leaders. I have published two books, the second of which (Lindsay, 2016) shared practices and methodologies as well as practical examples from many global

educators. This doctoral work was based on my need to understand more fully what is taking place in this area. Before this research, my intuition was that online global collaborative educators are uniquely and independently forging new pedagogical approaches from which all educators and education leaders may learn. I believed that online global collaboration could amplify global competency, intercultural understanding and digital learning capability, which in conjunction with emerging pedagogical approaches had the potential to transform learning. It was proposed that the results from this research might substantiate this claim and help to provide deeper understanding of collaborative learning in a global context.

3.3.1 Limiting researcher bias.

My approach to this research was influenced by prior knowledge and a desire to account theoretically for improved learning outcomes I have seen and experienced in online global collaborative work for the past 20+ years. As someone who has taken a pragmatic stance to online global collaborative learning the research methodology and method of this study was designed to build on my current knowledge through gathering qualitative data and interpreting educator experience, practice, beliefs and pedagogical approaches in response to the research questions. It was important that I addressed personal shortcomings and biases relative to the research and issues that may have impacted the study (Merriam, 2009). Researcher bias relates to quantitative research where influences can distort the result of the study however, in qualitative research the way the data is collected or analysed may be too closely aligned with the personal agenda of the researcher and therefore construed as 'bias' (Galdas, 2017).

According to Onwuegbuzie and Daniel (2003) bias occurs when the researcher has personal biases or a priori assumptions that may inadvertently affect data or results. Case study research may contain a bias towards verification, in other words a tendency to confirm the researcher's preconceived notions or beliefs (Flyvbjerg, 2006). Confirmation bias occurs when the researcher is drawn to details that confirm personal existing beliefs (Benson, 2016). One concern is that bias by the researcher may threaten external credibility of the findings, particularly if the findings become ungeneralisable (Onwuegbuzie & Daniel, 2003), therefore it was important that I

self-disclosed any assumptions, beliefs and biases that may have shaped the research inquiry (Creswell & Miller, 2000).

Bias may occur at the data collection, data analysis and data interpretation phases and is a threat to legitimation in constructivist research because the researcher is the one usually collecting the data (Onwuegbuzie & Daniel, 2003). Miles, Huberman, and Saldana (2014) shared two possible sources of bias: the effects of the researcher on the case; and the effects of the case on the researcher (p. 296). With the former, participants may construct responses to align with what they think the researcher wants to hear and to protect their own situation: possibly to make it sound better or worse in terms of the theme and topic. With the latter, the effects of the case on the researcher, my role was to overcome confirmation bias and not gravitate towards information that confirmed my preconceptions. Norris (1997) discussed selection bias through certain sampling of people or interview questions, and bias through affinity with explanations. He suggested it is not possible to eliminate bias through procedures however offers the use of critical friends to review data, researcher preferences, interpretations and explanations as a limiting approach (p. 174). My role during this research was to ask pertinent questions and be the 'listener' while parking my expertise. During the research process it was important that I identified subjectivities and monitored how they may shape the collection and interpretation of data. I was also aware of the tendency to remember things selectively and interpret data in a biased way.

Informed by Miles and Huberman (1994), potential bias in this research included two main areas:
1. The position of the researcher as a known global thought leader in the area of study and the affect this may have on the participants, and
2. The situation where some participants were well known to the researcher and the subsequent affect this may have on data collection, especially through the interviews. It is possible responses may take the form of what interviewees think I want to hear, rather than what they are really doing and thinking themselves.

In acknowledgment of this potential bias I focused on the research design where interview questions were shared with participants beforehand and member checking

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implemented afterwards. During the interviews an open forum for discussion beyond the immediate questions encouraged participants to speak more freely related to the broad topics and focus, hence moving beyond any potential bias based on the initial questions. I also refrained from relaying my expertise and knowledge to the interviewees and encouraged them to willingly share personal experiences free of my judgement and any requirement for my approval or disapproval.

3.4 Research Orientation

A philosophical underpinning of this research included the theoretical background, research paradigm and methodological approach. The research design aimed to explore how educators implement online collaborative learning in support of learning modes that move from local to global partnerships. Yin (2014) advised that some theory development prior to completing the research design and prior to collection of any data is desirable in order to determine what data to collect and to inform data analysis strategies.

3.4.1 Theoretical background.

The theoretical background informing the methodology for this research (Crotty, 1998) was informed in part by constructivism, constructionism and social constructivist pedagogy that support online collaborative learning. Constructivism (Piaget, 1929) informed the construction of knowledge, with attention to a constructivist collaborative approach. Constructionism, when learners construct a meaningful product in the real world (Papert & Harel, 1991), impacts understanding between virtual co-creators. Collaborative learning combines constructionism with social learning and is sometimes referred to as 'social constructivism', as informed by social development theory (Laurillard, 2009; Vygotsky, 1978). Social learning aligns with the theory and practice of connectivism (Downes, 2014; Siemens, 2006a) where the end-user constructs knowledge through contribution and involvement within the network. This study is also influenced by Online Collaborative Learning (OCL) theory (Harasim, 2012), more recently known as Collaborativism (Harasim, 2017).

As a theoretical construct, the Taxonomy of Global Connection (Figure 3.1), developed by Lindsay and Davis (2012), was integrated into the research design. The Taxonomy applies a stepped approach to help educators plan online global collaborative learning. Informed by the revised Blooms Taxonomy of Educational Objectives that classifies educational goals, objectives and standards (Krathwohl, 2002), the learning in the lower levels of the Taxonomy of Global Connection enables building of skills in the higher levels. As a constructivist application, and starting with Level 1: Intra-connection (within your own class) and culminating in Level 5: Student to student (with student management), educators can design appropriate online local and global experiences for their students. The taxonomy was used in this research to determine current educator levels of online global collaboration based on their understanding of the taxonomy levels in relation to their practice. Further discussion around the taxonomy takes place in section 3.6.1.
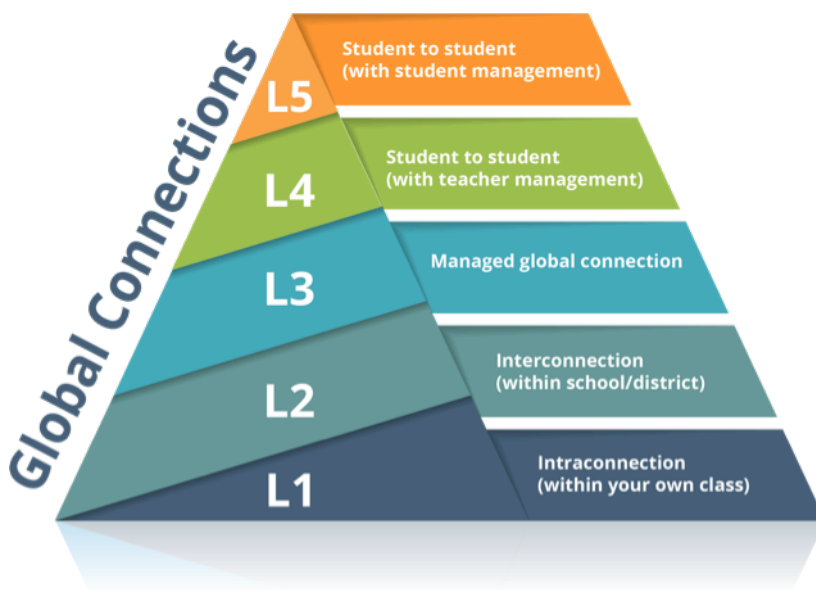
Figure 3.1. The Taxonomy of Global Connection (Lindsay & Davis, 2012)

3.4.2 Research paradigm.

The paradigm, knowledge claim (Creswell, 2003) or set of assumptions, concepts, values and practices that constitute a way of viewing reality (McGregor & Murnane, 2010) used in this research was post-positivism. Guba and Lincoln (1994) discussed a paradigm as a set of basic beliefs that represent and defined a worldview for its holder, and which are accepted on faith as truthful. The human and social sciences tend to use the post-positivist paradigm as it assumes there are many ways

of knowing aside from the scientific method (McGregor & Murnane, 2010) and that knowledge is 'relative' rather than 'absolute' (Merriam, 2009). A post-positivist approach is not necessarily about solving the problems set out in the research, but is about the struggle for meaning and can be more open-ended. It is not focused on an 'overall' truth through aggregating data (Ryan, 2006), or assume that truth is created and there is more than one truth (McGregor & Murnane, 2010).

This study was within the paradigm of post-positivism because of its reflexivity and because it was based on careful objective observation of the world (Creswell, 2003). My role as the researcher included taking on the challenge of contradictions and tensions that arise as part of the investigation (Ryan, 2006) while striving for trustworthiness through intellectual rigour and the synthesis of data.

3.4.3 Methodological approach.

An interpretive perspective within a constructivist context informed the research approach in this study. As an interpretive researcher I acknowledge that my aim was to uncover meaning and understand the deeper implications revealed in data about people. I also acknowledge that the construction of meaning through the interpretation of data could be both subjective and objective (Crotty, 1998). Interpretive research should allow for different perspectives as well as social and cultural influences on knowledge with the intent to understand what is happening (McGregor & Murnane, 2010). As a researcher I must frame a 'how' rather than a 'why' question (Denzin, 2002) and understand there are multiple perceived and/or experienced social realities rather than a singular truth (Schwartz-Shea & Yanow, 2013). For an interpretive researcher, what the world means to the person or group being studied is critically important to good research in the social sciences (Willis & Jost, 2007). Merriam (2009) posited that interpretivist researchers do not 'find' knowledge, they construct it.

Current thinking on socially constructed knowledge and on how individuals develop subjective meanings of their experiences can lead to the researcher looking for a more complex set of views, rather than narrowing meanings into a few categories or ideas (Creswell, 2003). As the researcher, my role then is to interpret or

make sense of the meanings others have about the world. In doing so I must adopt broad, general and open-ended questions and from these construct meaning that is relevant, applicable and true to the data collected. Taking a post-positivist stance as a researcher my approach is not about solving problems but may disrupt predictability of the interview and expected responses thereby engaging in a 'social construction of a narrative' with participants (Ryan, 2006).

An interpretive methodology within a post-positivist paradigm was used for this research. It was designed within the context of emerging pedagogical approaches for learning based on the theories of constructivism, connectivism and collaborativism. As the researcher, my background and experience may have influenced interpretation of the context and setting of the participants (Crotty, 1998) and there might have emerged constructed truths through interaction between researcher and researched (Schwartz-Shea & Yanow, 2013). My goal was to interpret these for others to understand as well, knowing that it is accepted practice to generate meaning in collaboration with participants within a constructivist framework.

3.5 Research Method and Design

A qualitative method was employed in conjunction with a case study research design based on a single case study (Yin, 2014). The research design was one case study bounded by the online global collaborative experience (the phenomenon) with embedded multiple units of analysis (the K-12 educators).

3.5.1 Qualitative method.

The research method employed for this study, referring to the approach to gathering and analysing evidence and presenting results (McGregor & Murnane, 2010), was qualitative. A qualitative research method was chosen due to my interest in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world (Merriam, 2009). Essential features of qualitative research include direct contact with participants; the researcher taking a holistic overview of the context; analysis mostly done with words, themes and patterns; and, above all, descriptions of understandings and actions of day-to-day people and situations, being ordinary events in natural settings

(Miles et al., 2014). Qualitative is a method that aligns with my preferred interpretive and constructivist approach. It seeks to uncover meaning (the why and how) through an overarching narrative-based approach to collecting and analysing data. This aligns with the interpretive research methodology, where qualitative research is most often located, that assumes reality is socially constructed, that is, there is no single observable reality, but multiple realities or interpretations of a single event (Merriam, 2009). In addition, a typical constructivist qualitative research study emphasises data collection through the medium of an interview in order to understand a phenomenon from the perspective of those experiencing it. According to Given (2008), through the researchers mutual interaction understanding is co-constructed with that of the participants.

An important feature of qualitative research is the use of narrative, discourse and storytelling to share the researched phenomena (Ryan, 2006). Narrative reporting has advantages of conveying deep meaning, reader accessibility, and opportunity for readers to recognize and consider researcher subjectivity (Mabry, 2008). Qualitative research also allows for innovation and working within researcher-designed frameworks (Creswell, 2003). My approach to this research was to explore the narrative storylines of online global collaboration through interviews with practicing global educators.

3.5.2 Case study.

Case study methodology was selected for this research as it enabled me to answer *how* and *why* type questions, while taking into consideration how a 'phenomenon' is influenced by the context within which it is situated. A case study approach to research particularly resonated with my standpoint as an interpretivist researcher. It is through a case study approach, utilising open-ended interview questions and a semi-structured interview design, that I believe more comprehensive and more in-depth information about a person and a situation can be discovered, leading to deeper understanding about what works best in educational practice.

3.5.2.1 Case study strategy.

The case study has its origins in the qualitative strategy of inquiry with an emphasis on in-depth exploration (Chadderton & Torrance, 2011; Creswell, 2003). The exploration can be of a program, event, group or individuals with implicit rather than explicit comparisons (Stake, 1978). Cases may be bounded by time and activity and data collected using a variety of procedures over a sustained period of time (Creswell, 2003). In-depth case study investigations are required to determine the quality and extent of the teaching and learning experience (Cox, 2008). They enable the researcher to generate principles or guidelines for pedagogic design and implementation (Pilkington, 2008).

Baxter and Jack (2008) described rigorous qualitative case studies as affording researchers the opportunity to use a variety of data sources to explore and describe a contextual phenomenon. Mabry (2008) referred to educators engaging in phenomenology as they use their own perceptions while working to document human perception and experiences. The need for a case study approach in order to understand complex social phenomena is acknowledged by Yin (2014).

The use of a case study approach is effective and well established in the area of educational technology research, with representative examples pertaining to research on educator practice (Arteaga, 2012; Kim et al., 2013; Oran, 2011), student learning and outcomes (Greenhow & Robelia, 2009), online global projects (Wells, 2007) and multiple case-study research design (Ertmer et al., 2012). Simons (1996) argued that by focussing in depth and from a holistic perspective, a case study can generate both unique and universal understandings. She suggested focusing on the kind of understandings that case study can yield reveals the paradoxes within the cases studied including 'new ways of seeing' and 'new forms of understanding' what is not apparent.

According to Stark and Torrance (2005) a case study is an approach to research that is within the 'social constructivist' perspective of social science and may stress social interaction and the social construction of meaning *in situ*. In juxtaposition to the social constructivist perspective, Stark and Torrance (2005) also shared the

weakness of a case study being the apparent impossibility of generalising statistically from one or a smaller number of cases to the population as a whole. Criticism of the case study approach, including not being able to generalise on the basis of a single case, or that case studies are arbitrary and subjective, is discussed by Flyvbjerg (2006) who found that what was held to be conventional wisdom was in fact wrong or misleading. He concluded that depth and breadth are needed in social science research, and that quantitative broader samples in conjunction with in-depth qualitative approaches are both possible.

3.5.2.2 Case study design.

The decision to implement a case study design included careful consideration of structural design features to maximise data collection, analysis and final reporting. Yin (2014) considered research design to be a logical plan that connects research questions and empirical data collection to its conclusions, and above all helps avoid the situation in which the evidence does not address the initial research questions. Yin (2014) claimed a case should be a real-life phenomenon that has an observable manifestation, while Miles et al. (2014) defined a case as "a phenomenon of some sort occurring in a bounded context…[and]…a unit of analysis" (p. 28).

The focus of the case study design for this research was on the experiences of educators and how they implemented global and collaborative online teaching and learning experiences. The context was K-12 education, with embedded multiple units of analysis being individual global educators (Yin, 2014). In short, the research design chosen is one case study bounded by the online global collaborative experience (the phenomena) with embedded multiple units of analysis (the educators) (Yin, 2014), as shown in Figure 3.2.
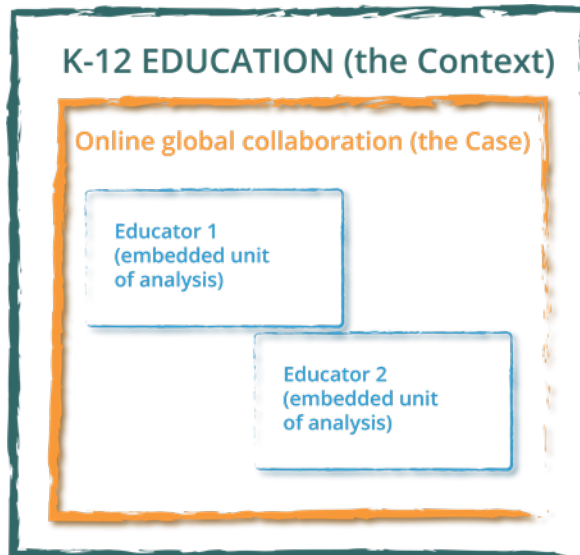
Figure 3.2. Single-case design with embedded multiple units of analysis (based on Yin, 2014)

A single case design is justifiable where the research represents, amongst other options identified by Yin (2014), a critical test of existing theory, or where the case serves a revelatory purpose. In this research design, the case of online global collaboration aimed to explore and reveal current practices and theories of online collaborative learning in constructivist and connectivist learning environments that reach beyond the single classroom. In addition, it was revelatory in that I had the opportunity to interview and analyse data related to a phenomenon (online global collaboration) that has evolved as availability of online technologies and networks in K-12 schools have expanded. It is important to be aware that Yin (2014) advises a pitfall of an embedded single case design is that the case study may focus on the sub-unit level only (the individual educators) and fail to return to the larger unit of analysis (the phenomenon of online global collaboration).

The chosen single-case research design had two phases:

- Phase 1: Online survey - Exploration of a representative sample of educators (n=65) from a range of countries, educational situations and disciplines who were implementing online global and/or collaborative opportunities for themselves and/or their students.

- Phase 2: Semi-structured interviews - A single case-study method that investigated educators participating in more extended and ongoing online global projects and collaborations (n=8).

The process of how Phase 1 moved smoothly into Phase 2 is described in more detail in the next section.

3.5.3 Recruitment procedures.

The intention of this research was to go beyond the confines of one particular education system, class level or country. The research setting therefore was broad and global in concept and practice. Recruitment procedures meant K-12 educators anywhere in the world could initially contribute regardless of any or actual level of experience or involvement in online global collaboration. Through a personal and altruistic motivation to share and contribute to this research, the participants self-selected. Many of the initial respondents I knew or knew of through my network. As Stake (1995) shared, "the researcher must have a connoisseur's appetite for the best persons, places and occasions" (p. 56). By 'best' he was referring to selecting those that best help with understanding about the case. In this research the 'best' may be typical educator practice, or not.

With the intention of attracting educators from a wide variety of K-12 education settings in different countries, recruitment for Phase 1: Online survey was a multi-pronged approach. Participants were invited to contribute through personal invitation from me as well as through a public open invitation. Messages of invitation were sent through my network, including to educators involved in Flat Connections global projects, inviting participation. These were sent via email, Twitter, LinkedIn, online newsletters, posting on other organisations' websites and via announcement blog posts. The Phase 1: Online survey data gathering tool (see Appendix 1) shared pertinent criteria and encouraged contributions from educators who currently or previously had participated in, or facilitated, online global collaborative learning. It was anticipated about 50 educators would respond to this survey, therefore meeting the essential goal of Phase 1 which was to provide a sufficiently broad base of options for educator invitations to Phase 2: Semi-structured interviews. The introduction to the online survey stated:

> The purpose of this research is to collect information from K-12 educators
> to do with their involvement and practices with online global collaboration

and the use of digital technologies with a view to analysing emerging pedagogies and enriched learning experiences.

From the data collected in Phase 1, participants for Phase 2 were selected and invited to participate in the case study research. As one criterion, educators were deliberately chosen from a range of countries therefore conducting research with non-Australian participants, as outlined in Commonwealth of Australia, 2007. NSECHR 4.8 (National Health and Medical Research Council (NHMRC), 2007), required particular attention to ensure the correct authorities, as may be required in the country and/or school of the educator, were invited to respond. To comply with this requirement, a letter was sent via the volunteer educators for their school leader explaining the research and asking for permission to participate (it was at their discretion whether this was required). The essential criterion for selection for Phase 2: Semi-structured interviews was that educators had been, or currently were at the time of invitation, or planned to be during the period of research, involved in a more extended online global collaboration that was continuous for at least six weeks. The 'six weeks' criterion was chosen as a significant enough amount of time to have built a collaborative relationship with one or more classrooms at a distance. In my experience of online global collaboration between schools and crossing borders virtually into other countries, six weeks is the minimum amount of time needed to connect, communicate, collaborate and move towards co-created learning outcomes. Typical examples of projects where duration is six or more weeks include The Global Read Aloud (six weeks in length, https://theglobalreadaloud.com/) and iEARN Learning Circles (eight weeks or more, http://www.globallearningcircles.org/).

3.6 Data Collection Strategies and Tools

As the researcher, my responsibility was to collect data that revealed a full picture of the educator's situation within a school related to experiences, beliefs and online global collaborative practices. The goal of this research was ultimately to find educators who would help me solve the research problem. Principle data sources supported this goal through the use of an open online survey and personal interviews with online globally collaborative educators. The online survey data collection was designed to gather information, both quantitative and qualitative regarding

educators' ideas, experiences and involvement in a variety of online global collaborative experiences with their students. The personal interviews, using online tools for communication (such as Skype), were conducted with selected invited educators who had demonstrated, through the survey, participation in online global collaborative learning, with reference also to the Taxonomy of Global Connection. The following sections further explain data collection strategies with reference to tools used for both Phase 1: Online survey and Phase 2: Semi-structured interviews, commencing with further explanation of and justification for using the Taxonomy of Global Connection.

3.6.1 The Taxonomy of Global Connection.

Underpinning data collection for this research was the conceptual framework of the Taxonomy of Global Connection (Lindsay & Davis, 2012), previously shown in Figure 3.1 (and in Appendix 2). A colleague and I developed this taxonomy during the years 2006-2011 while designing and implementing Flat Classroom online global projects. It was created in response to typical approaches to online collaborative learning we evidenced at the time and based on the projects we designed and offered to help educators understand implementation levels and approaches. The taxonomy aims to classify global connections and in particular online global collaborative learning objectives into a series of experiences and priorities. These range from within the immediate classroom to various collaborative options beyond the classroom. Further explanation of the Taxonomy of Global Connection, shared in Tables 3.1-3.5, demonstrate how intra-class connections can develop and extend into inter-class connections and then into managed variations of global connections and collaborations between classrooms and schools.

The taxonomy implies that effective online global collaboration relies on being able to sustain connections beyond the virtual, synchronous experience; that asynchronous networks and online communities support collaboration; and, that global connection management is needed for successful outcomes. The taxonomy also refers to the changeover or shift from teacher-managed to student-managed learning. For this research, the efficacy of the taxonomy is primarily as a lens for

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understanding educator experience and a way of categorising participant responses to the Phase 1: Online survey.

3.6.1.1 Theoretical underpinning of the Taxonomy of Global Connection.

The Taxonomy of Global Connection is informed in part by the revised Bloom's Taxonomy of Educational Objectives that classifies educational goals, objectives and standards and shares how a learning pathway progresses (Krathwohl, 2002). It also aligns with Vygotsky (1978) and social development themes of social interaction', social constructivism and group work, the 'More Knowledgeable Other (MKO)', and the 'Zone of Proximal Development (ZPD)' where learning occurs in the zone between a learner's ability to perform a task with guidance and their ability to solve the problem independently.

The goal of applying the Taxonomy of Global Connection was to support educators' understanding of connected and collaborative learning and practices that iteratively implement progressively more challenging types of online collaborative learning in a virtual global context. For all five levels, online communication between learners may be synchronous (interacting and communicating in real time in person or virtual) or asynchronous (interacting and communicating not in real time). Variables across the taxonomy include who learners communicate and collaborate with, what structures and tools are in place for them to do this, and who manages this and how they manage it.

As a constructivist application, the learning that takes place in the lower levels of the taxonomy enable progressive building of skills for the higher levels. Starting with Level 1: Intraconnection (within class) and culminating in Level 5: Student to student (with student management), educators can design appropriate online local and global experiences for their students. The taxonomy is not meant to be prescriptive, and educators must be mindful that they could be implementing one or more modes simultaneously or over a period of time, such as an academic year. They could also be implementing a blended approach across levels depending on the learning objectives and design at the time.

3.6.1.2 Level 1: Intraconnection.

Level 1: Intraconnection, shown in Table 3.1, applies when connection, communication and collaboration occurs within a defined learning environment such as a classroom (real and/or virtual). There is typically one teacher and a set of students. An example of Intraconnection is a Grade 4 teacher who uses the school learning management system (LMS) to connect with all students and share lesson objectives and resources. The teacher may also have a class blog, class wiki and other Web 2.0 tools to share class activities and encourage collaboration within the group. Students are able to access these tools and continue the interactions at any time when they are online.

Table 3.1

Overview of Level 1: Intraconnection, Taxonomy of Global Connection

Level 1	Characteristics (What learning looks like)
INTRACONNECTION - Within a unique class This level applies when connection, communication and collaboration occur within a defined learning environment such as a classroom (real and/or virtual). There is typically one teacher and a set of students.	Learners come together as a community for learning (an inner circle) within the same school or institution. Online learning tools, often Web 2.0 tools, are used to connect learners when they are face-to-face and/or virtual. Communication and collaboration takes place within the inner circle, although the extended community may benefit from shared co-created artefacts. The real goal of Intraconnection is for educators to realise learning is not dependent on actually being in the class together at the same time. Online means of communication and contribution are established so that 'when the class walks out of the door at the end of the day' essential online places and spaces continue to bring participants together virtually to share knowledge.
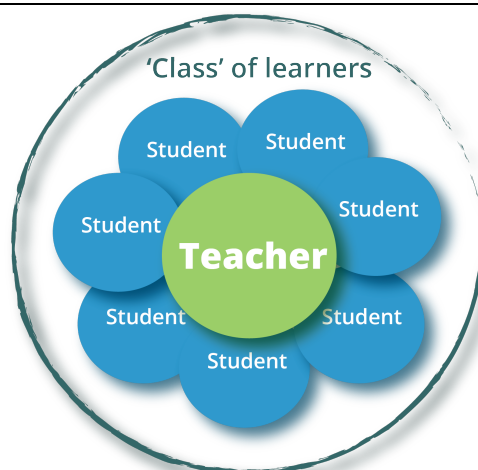
3.6.1.3 Level 2: Interconnection.

Level 2: Interconnection, shown in Table 3.2, applies when learners connect beyond the 'inner circle' of Level 1: Intraconnection. Interconnection takes place when a class connects with another class for the purpose of sharing ideas, intercultural understanding, problem-solving and other collaborative activities. There may be opportunities for real time meetings (in person or virtual) and the focus and skill acquisition revolve around 'distance' at a close proximity that actually 'feels global'. An example of Interconnection is two Grade 4 teachers in schools on either side of a town/city who decide to join their classes together for activities. Tools used must be online and accessible by both classes (not within a school LMS). A typical activity may be to read and comment on each other's class blogs, share school happenings, initiate Skype calls to share learning experiences, or share via a common Twitter hashtag.

Table 3.2

Overview of Level 2: Interconnection, *Taxonomy of Global Connection*

Level 2	Characteristics (What learning looks like)
INTERCONNECTION - Learning together across classes This level applies when learners connect beyond the 'inner circle' of Level 1. Interconnection takes place when a class connects with another class for the purpose of sharing ideas, intercultural understanding, problem solving and other collaborative activities.	Typical applications of this 'learning together' level occur between classes within the same or similar geographic proximity - even within the same school - so that connection and communication in real time is easier due to same or similar time zones. Student interaction is usually confined to class activities and is not independent of the teacher. Teachers are in communication and provide the conduit for collaborative class-to-class activities. Shared artefacts online are viewable by all participants at any time.
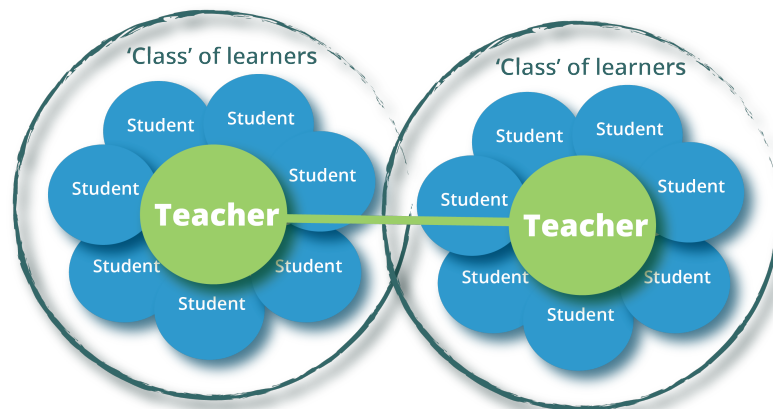
Table 3.3

Overview of Level 3: Managed global connection, Taxonomy of Global Connection

Level 3	Characteristics (What learning looks like)
MANAGED GLOBAL CONNECTION - Designed collaboration between many classes This level applies when collaborative learning, typically a global project, takes place that is designed and managed by educators. Connection is established between classrooms located anywhere through carefully chosen online tools, structured project-based learning design, and mutually agreed outcomes.	Under the direction/management of the teacher, learners in each class apply themselves to activities around a mutual group topic or theme over an extended period of time. Typically, students are not connected directly to each other online, however there are opportunities to share digital handshakes and 'meet' the other collaborators via Skype or other synchronous means.
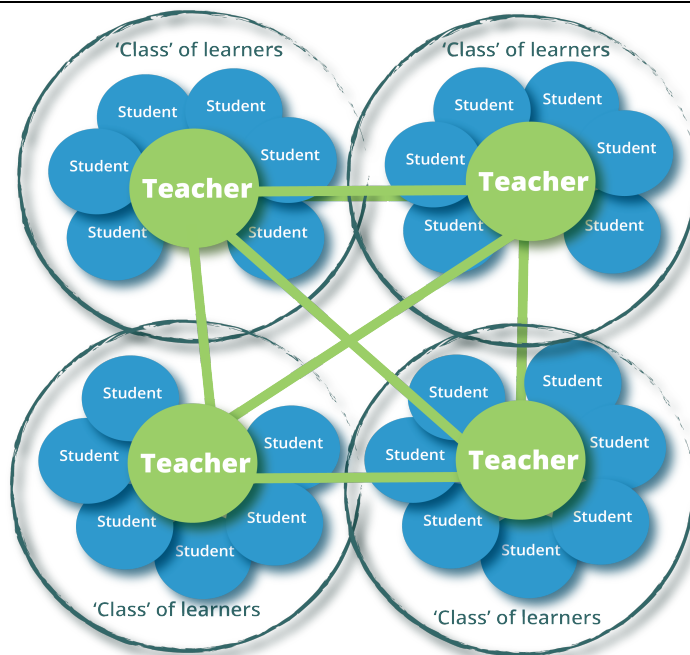
3.6.1.4 Level 3: Managed global connection.

Level 3: Managed global connection, shown in Table 3.3, applies when collaborative learning is designed and managed by educators. Connection takes place between classrooms located anywhere in the world through carefully chosen online tools, structured project-based learning design, and mutually agreed outcomes. An example of Managed global connection is a group of Grade 4 teachers come together to design learning (typically a 'global project') around a global issue over a period of six or more weeks. This may involve reading the same book, writing, recording audio and/or video, inviting guests into the classroom and so on. Typically, students are not connected online to one another directly; however, there may be

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opportunities to Skype or join other real time meetings. The 'product' becomes a focus, such as a website or eBook or a scrapbook, with each class and/or student usually creating something to 'share back' to the group. Teachers are responsible for processing material from the collaboration and uploading finished work.

Table 3.4

Overview of Level 4: Student to student with teacher management, Taxonomy of Global Connection

Level 4	Characteristics (What learning looks like)
Student to Student with Teacher Management - Designed collaboration and student autonomy This level applies when students are given responsibility to initiate vital connections, maintain communication, and develop collaborative learning modes beyond the classroom. This is done under the direction and support of the teacher.	For this level students are connected directly to each other (as compared with Level 3: Managed Global Connection where teachers are the ones to connect on the student's behalf). Typically, global project design places students in mixed classroom groups and uses open online platforms and tools that allow for direct student-to-student communication, interaction and collaboration. Team-based research often leads to co-creation of digital artefacts. All classes become one class.
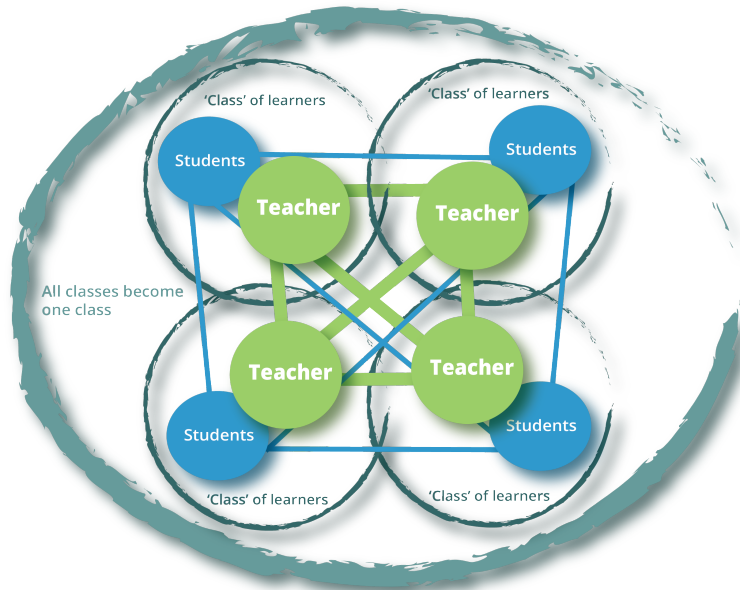
3.6.1.5 Level 4: Student to student with teacher management.

Level 4: Student to student with teacher management, shown in Table 3.4, applies when students are given responsibility to initiate vital connections, maintain communication, and develop collaborative learning modes beyond their immediate classroom. This is done under the direction and support of the teacher. An example of Student to student with teacher management is a mixed group of classrooms from Grade 4-6 levels come together to complete a global project over a period of six or

more weeks. Cross-class student groups are formed and communication takes place using one or more Web 2.0 tools (such as Edmodo, FlipGrid, Voicethread). Teachers manage and monitor global collaborative objectives and help determine final outcomes. Powerful peer-to-peer learning takes place between students through (usually asynchronous) online discussions, sharing of ideas and resources and contribution to a co-created final product(s).

Table 3.5

Overview of Level 5: Student to student with student management, Taxonomy of Global Connection

Level 5	Characteristics (What learning looks like)
Student to Student with Student Management - Designed collaboration, student autonomy and management This level is likely the most connected or 'flat' style of online global collaboration where students take on leadership roles and manage learning across classrooms and groups. Students should be independently able to access all online researches to complete the global collaboration in an autonomous learning environment.	This level takes a further step again, compared to Level 4, towards establishing an independent and autonomous student-centred learning environment. Teachers are available as facilitators and monitor for possible negative digital citizenship behaviours, cultural disconnect and non-participation, although intervene only when needed. Students may collaborate within agreed boundaries, or may evolve the collaboration over a period of time. A period of 6 or more weeks is typical.
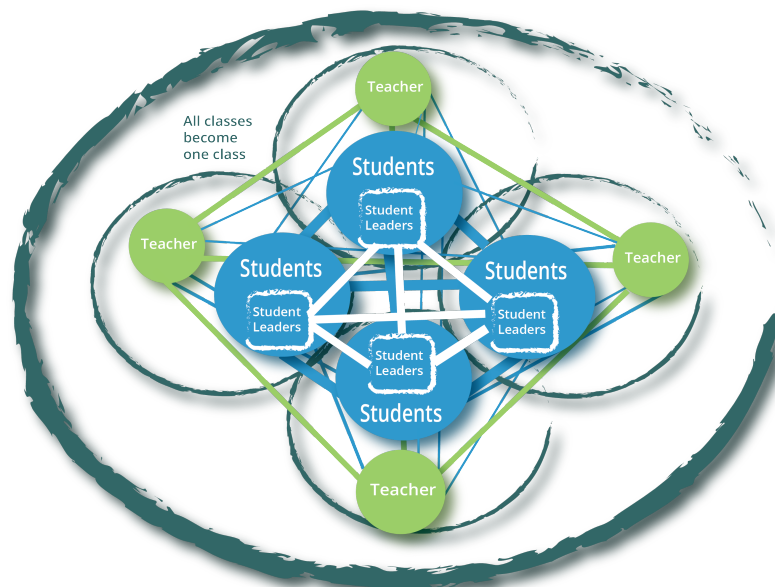
Level 5: Student to student with student management

3.6.1.6 Level 5: Student to student with student management.

Level 5: Student to student with student management, shown in Table 3.5, is likely the most connected or 'flat' style of online global collaboration where students take on leadership roles and manage learning across classrooms and groups. An example of student to student with student management is a group of classes come together to explore the impact of emerging technologies on education and learning. In mixed classroom groups (teacher input may be required to set this up) student leaders organise, encourage and support collaborative activities. Sharing of ideas and resources is vital and outcomes may include co-created and individual artefacts.

3.6.1.7 Using the Taxonomy of Global Connection tool as a lens to view the data.

The taxonomy was used in this research design to provide an indication of educator global collaborative experience and to determine current educator levels of online global collaboration. Specifically, it was used to indicate frequency of using each level of the taxonomy and to find educators for Phase 2: Semi-structured interviews data collection who were implementing online global collaborative learning at Levels 2, 3, 4 or 5 for a period of six or more continuous weeks. This experience in and commitment to online global collaboration identified educators who had moved beyond the initial synchronous video conferencing call approach, common amongst new comers to this global collaborative pedagogy. Communication of working at levels 2, 3, 4, and/or 5 for six or more weeks may indicate educators had experienced and overcome numerous struggles personally as well as within their school, and across schools, in order to embed longer collaborations into the curriculum. It may also indicate they were possible leaders in this pedagogy and influencers for others or advocates for new ways of using online technologies to join students for meaningful learning experiences.

3.6.2 Data collection Phase 1: Online survey.

In Phase 1 participants responded to an online survey (see Appendix 1). The goal of the survey was to collect data from a representative sample of online global collaborative educators, and from that sample determine a shortlist for Phase 2 interviews. The online survey was created using a Google form made public via an

accessible website and subsequent URL. Responses fed into a Google spreadsheet, password protected and viewable only by me. The use of an online survey provided the opportunity to collect quantitative data that is discussed more fully in Chapter 4. This approach is confirmed by Yin (2014) whereby surveys or other quantitative techniques to collect data about the embedded units of analysis may rely on holistic data collection strategies for studying the main case. Given that the online survey for Phase 1 was shared through known closed networks as well as more widely on the internet using Twitter and other social media tools, and therefore open to anyone in the world to complete at their leisure, reliability and validation of data was a possible risk. Participants initially gained access to the survey without barriers or the need to confirm their identity and freely answered the first set of questions. Each subsequent stage of the survey included additional criteria and asked permission from the participant to continue to the next stage. Questions were carefully phrased to avoid possible spammers and time wasters. The validity measures taken resulted in less than five responses that were not suitable. There were two main reasons why these five were unsuitable: 1) they did not supply enough information to be worthy (skipped questions and/or vague answers); or 2) they represented higher education or systems not in line with the K-12 focus of this research.

The online survey was in three parts, A, B and C. Both Parts A and B required anonymous responses, while Part C, if the educator elected to complete this, asked for personal details which were used in the next phase. The first part of the survey, Part A, collected brief demographic information related to teaching location and position, age and number of years teaching. The second part of the survey, Part B, asked for responses based on experience and practice in online learning and online global collaboration. It initially focused on the use of synchronous and asynchronous online learning technologies and modes for intra-class and interclass connections, exploring both educator personal learning and student learning. It also asked broad questions concerning participant definitions of 'global educator', 'global collaborator' and 'online global collaboration'. Additional questions about personal 'comfort level' using online technologies for learning and for global collaboration encouraged deeper responses related to personal ability to implement online global learning experiences with students. Educators were also asked for their opinion about

barriers and enablers to online global collaboration, based on personal experience. Finally, responders shared any pertinent blog posts or websites that revealed their online global collaborative participation.

Part C of the survey elicited interest from educators in joining Phase 2: Semi-structured interviews, of the research. It specifically referred to the Taxonomy of Global Connection (Lindsay & Davis, 2012), to prompt information about levels of participation in online global collaboration. The taxonomy diagram and further explanation of the levels (see Appendix 2) was available on an alternative Google doc accessible via a URL linked from the survey doc. Participants reviewed the taxonomy before completing associated relevant questions. Part C also asked for specific information relating to the current teaching situation and, more importantly, whether the participant had previously or was planning to participate in, during the period of this research, an online global collaboration of levels 2, 3, 4 or 5 as per the taxonomy. If the response was 'no', the survey terminated at that point. Those who responded 'yes' then shared pertinent demographic information including name, location, school, contact details, and online identities. They then described an online global collaboration of level 2, 3, 4 or 5 (as per the taxonomy) designed to run for a minimum of six weeks that they had participated in or planned to participate in. The selection for participants in Phase 2 pertained to data gathered through affirmative responses to Part C of the online survey. Chapter 4 reveals this in more detail.

3.6.3 Data collection Phase 2: Semi-structured interviews.

According to Stake (1995), "The interview is the main road to multiple realities" (p. 64). For this research, the Phase 2 approach was a semi-structured interview with data collected through online sessions that were recorded and then transcribed. Participants short-listed from the Phase 1: Online survey material needed to have implemented previously or were planning to implement during the survey and interview sessions an online global collaboration, as per the Taxonomy of Global Connection, of at least Level 2 for a minimum of six weeks.

In preparation for Phase 2 interviews, a participant information form was sent to each invited candidate along with a consent form to be signed and returned prior to

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the interview. If requested, an interview consent form was also sent for the school leader to sign thereby providing approval for the educator to participate. Prior to being interviewed, interviewees were sent a document outlining the interview process. This included the following introduction:

> The purpose of this research is to document and analyse the experiences of K-12 educators who are implementing online global collaboration (using digital technologies to connect students with others in the world for collaborative outcomes) and to describe pedagogical approaches (methods used by the educators while implementing online global collaboration) that may be influencing pedagogical change (new or emerging methods by educators that support online global collaboration that are becoming embedded in everyday pedagogy).

> Phase 2 of this research is designed as a Case Study to collect information from a small group of selected and invited K-12 educators (n=8) in different parts of the world through interview and observation of online contributions. The semi-structured interview questions will ask for responses to do with involvement and practices with online global collaboration and the use of digital technologies. Participants will be asked to converse freely beyond the questions to share further details of experience.

Each of the eight interviews took about one hour and were conducted online through Skype or a virtual meeting room tool called Fuze (http://fuze.com). Each interview was audio recorded on both an iPhone using the Voice memo app, and as a backup using an app on the computer called Easy Audio Recorder Lite. I transcribed the recorded interviews onto individual Google docs using a table format that listed the number of rows (in order to more easily find and retrieve items). Some indication of emotion was included as part of the transcript, such as 'laughs', 'looked concerned', 'paused before replying', in order to remember intent and approach to particular answers.

Interviewees were sent a copy of the possible interview questions, three sub-research questions and supporting interview questions, as shown in Table 3.6, prior to the online interview. Given the semi-structured approach taken, each interview was unique in the selection and progression of questions. However, all three of the research areas were covered in all interviews. Regarding 'the bigger picture' questions shared in the last row of Table 3.6, questions 1 and 2 were asked explicitly of each participant; while questions 3-5 were covered implicitly. This means that

although question 1, 'It has been said school culture must change to value international interactions and collaborations. How? Why?' and question 2, 'In your opinion, is global collaboration a pedagogy? A curriculum? Both?' explicitly warranted educator responses, questions 3-5 were woven into the flow of the interview and included implicitly as part of the ongoing conversation, as the unique situation mandated. In addition, all interviewees were sent the chart and descriptive material explaining the Taxonomy of Global Connection (material they had seen previously when completing the online survey).

Table 3.6

Phase 2 Interview Questions Aligned with Research Sub-Questions

Research question 1: What are the experiences of educators who implement online global collaboration?	Research question 2: How do educators' beliefs about learning and teaching influence their engagement in online global collaboration?	Research question 3: In what ways do educators' personal pedagogies enable online global collaboration?

Supporting interview questions:
1. Can you start by briefly defining some background material - confirming the number of years teaching, where you have been teaching, what levels, responsibilities within the school and classroom and so on.
2. What is your understanding of online global collaboration?
3. What does online global collaboration look like in your classroom?
4. How have you managed online global collaboration?
   a) Enablers
   b) Barriers
   c) Working modes with other educators
5. Collaborative learning - what does that look like?
6. What have been the main outcomes?
   a) For students?
   b) For teachers?
7. What have been keys to improvement?
8. School logistics
   a) Was/is your school aware of your online global collaborative learning?
   b) What impact has the school had on your ability to introduce and sustain this?
9. Do you have evidence of online
	Supporting interview questions:
	1. Use of online and other digital technologies
	   a) What do you have available in the classroom?
	   b) What do you use regularly? How has this changed from previous years?
	   c) What autonomy do you have to make decisions about technology use?
	   d) What are the main challenges of using online technologies for global collaboration?
	   e) How comfortable are you using online technologies?
	   f) Can you describe how your beliefs about the use of online technologies influenced the way you approached the online global collaboration?
	   g) How important is it to you and your students to have activities, reflections and products visible to the world? Why?
	2. Teacher professional learning:
	   a) What professional learning have you completed to prepare for online global collaboration in the classroom?
	   b) How did teachers in the online global collaboration
		Supporting interview questions:
		1. How would you describe your approach to teaching and learning?
		2. How has your approach to teaching and learning changed, if at all, due to the increased use of digital and/or online technologies?
		3. Can you describe how you align online global collaboration with your approach to teaching and learning curriculum? Can you describe the process of planning and implementing?
		4. How difficult is it for you and/or your students to work with others at a distance?
		5. How do you explicitly teach collaboration skills for global connections?
		6. How do you support learners to build a shared understanding of the task to be accomplished or product to be created when working at a distance with others?
		7. Was there student independence in learning during the global project? If yes, how was this supported?
		8. Can you describe how your students learned how to learn with the world?
		9. How did you use online technology to fulfil collaborative

global collaboration? (Blog, wiki, other?)

build a shared understanding of the task to be accomplished and/or product to be created?

c) In retrospect, what didn't you know, or what should you have found out before connecting yourself and your students to the world?

d) What did you need or do you still need as accelerators into online global collaboration?

e) Can you describe the professional learning advantages, or disadvantages from the online global collaboration with other educators and classrooms?

f) Can you describe what skills and attitudes are present/needed amongst teachers for online global collaboration?

functionalities not available in usual face-to-face situations?

10. What strategies did you adopt to blend synchronous with asynchronous global experiences?

11. What is the role of social media and social learning in online global collaboration (if any)?

12. What role does Web 2.0 technologies play in online global collaboration?

13. Why did you put time and effort into developing global collaborative learning experiences? Did you achieve the learning outcomes you wanted?

14. Can you describe any changes in the way you teach that have come about through participation in online global collaboration?

15. Can you describe any changes in the way you connect with other educators and learn as a result of your participation in online global collaboration?

The bigger picture:

1. It has been said that school culture must change to value international interactions and collaborations. How? Why?
2. In your opinion, is global collaboration a pedagogy? A curriculum? Both?
3. Are other educators in your school also connecting and collaborating globally? Why? Why not?
4. Is your school prioritising global collaboration as a curriculum objective? Why? Why not?
5. What do other educators need to support online global collaboration?

Participants were also informed that:

- A semi-structured approach is applied with questions listed as a guide only;
- Responses to do with involvement and practices with online global collaboration and the use of digital technologies are sought;
- Participants are asked to converse as they wish beyond the questions to share further experiences and freely tell a personal story about online global collaboration as it has happened; and
- Data from the interviews would be kept anonymous and confidential.

As the researcher, I was mindful of the advice from Yin (2014) informing that case study interviews require the researcher to operate on two levels at the same time: 1) following a line of inquiry according to the case study protocol established; and, 2) asking open-ended, conversational and non-threatening questions in a friendly and not necessarily ordered way.

3.7 Data Analysis Strategy

Given that data collection for this study was through two main approaches, namely Phase 1: Online survey and Phase 2: Semi-structured interviews, a variety of analysis strategies were employed.

3.7.1 Data analysis approaches for Phase 1: Online survey.

Phase 1 data collected through the online survey was qualitative with a quantitative blend. One approach was to use the Taxonomy of Global Connection as a lens with the aim of finding evidence of online global collaboration at Levels 2, 3, 4 and 5, in order to select and then invite participants to be part of Phase 2. Therefore, data gathered concerned the frequency and level of alignment of global collaborative practice with the taxonomy. Another approach was to use the survey questions to gather qualitative data about the use of online technologies and learning environments that support or inhibit online global collaborative practices with a view to better understand how educators overcame barriers and connected learning through global collaborative activities. Charts in conjunction with descriptive text helped to reveal data analysis from the survey and this strategy is shared further in the next section.

3.7.2 Data analysis techniques for Phase 2: Semi-structured interviews.

An iterative approach to data analysis was taken for Phase 2 whereby initial manual analysis revealed broad themes and key words. Further software-supported analysis and coding led to a schedule or 'coding playbook' construction, with categories delineated through a memo-based approach. In conjunction with this method, the use of visual representation of data when presenting the global collaborative educators was employed.

3.7.2.1 Coding.

A code is a word or short phrase. Coding refers to "labels that assign symbolic meaning to the descriptive or inferential information compiled during study" (Miles et al., 2014, p. 71). The transcribed interview data (into Google doc tables) were provisionally analysed with an open coding method (Strauss & Corbin, 1990) in order to delineate concepts and identify blocks of raw data. This holistic approach to

data reduction employs an inductive process where common themes and categories are identified from the interview transcripts (Saldaña, 2013). In addition, a structural approach was taken whereby each transcript was applied manually with strokes of colour across large sections of text for each theme and sub-theme. I was working at a conceptual as well as a more delineated single or grouped word level, finding key terms and phrases amongst the larger chunks of thematic text. More importantly, this transcription and manual coding took a considerable amount of time and while doing this I became more aware of the need to find authentic common themes, key words and concepts, and to gather the data together in more sophisticated groupings.

In response to a need for deeper and broader analysis and to make vital connections between data sets, I then employed qualitative data analysis software, NVivo 11 software by QSR International Pty Ltd (https://www.qsrinternational.com/). NVivo is designed for qualitative researchers working with very rich text-based and/or multimedia information, where deep levels of analysis on small or large volumes of data are required. It allowed me to search and cross-reference the data in more efficient and alternative ways compared with simple manual coding. Using NVivo I essentially duplicated the Google doc coding approach through selecting blocks of text representing themes. However the facility of the software also provided for cross-referencing key terms and words.

A coding approach may be data-driven and can grow structurally from specific research goals and questions and emerge from the raw data (DeCuir-Gunby, Marshall, & McCulloch, 2011). Coding is judgmental (Saldaña, 2013) and heuristic (Miles et al., 2014) and takes considerable reflection and redevelopment as an ongoing analytic tactic. As data analysis continued, I considered how to best represent educator voices through adopting systematic coding (Saldaña, 2013). A coding schedule or what is finally described as the 'Coding Playbook' (see Appendix 3), specifically refers to tactics and strategies used in data coding for this study and was created based on development of initial codes revised and refined throughout the data analysis stage. This process, informed by the interview coding work of DeCuir-Gunby et al. (2011) with reference to the coding schedule structure of Hay (2017), included the process of personal memos and freewriting.

3.7.2.2 The 'Coding Playbook'.

Supported by the software, NVivo, the updated approach to coding became a more complex schedule and enhanced the iterative approach to data analysis by extracting key evidence in support of the research questions. It allowed me to 'see' themes, concepts, ideas and practices at a more magnified level to reveal depths of what educators were sharing with me which could not have been reached using the former less complex manual coding approach. Developing a coding procedure was very important to the success and therefore the clarity of data analysis. As a process of deeper analysis, it enforced a more organized working mode, reshaped my perspective of the data and contributed to reconceptualisation of the coding playbook that was finally implemented.

The Coding Playbook construction leveraged and documented a variety of coding techniques including descriptive, process, In Vivo and values coding. Through descriptive coding (Saldaña, 2013) I utilised a word or short phrase (often a noun) to summarise the primary topic of the excerpt, for example 'use of online and digital technologies', 'relationship with other teachers'. These codes formed the basis of the coding playbook. Process coding (Miles et al., 2014) using 'ing' words to connote action in the data was useful to extract participant action, for example 'collaborating', 'communicating with parents', 'reflecting on past practice'. In addition, In Vivo coding was deployed to reveal and honour the participants voices (Saldaña, 2013) through identification of key words and colloquialisms. Numerous In Vivo codes were found in the research data and typically they are the most common form of data coding (Miles et al., 2014). Initially lists of words were garnered manually from interview transcripts, for example 'synchronous', 'design thinking', 'librarian', 'passion', technology', 'collaboration', 'global'. Through using the data software NVivo word query facility, search commonalities were discovered that amplified essential links between the interviewees. This added positively to understanding connections and relative importance leading to more complex outcomes.

To a lesser extent values coding was implemented whereby participants' attitudes, values and beliefs are represented. As coding is not a precise science I found the task of distinguishing between an attitude, a value and a belief to be challenging, however, I did find that the attempt was valuable as part of the overall goal of determining a final coding approach. Attitudes included terms such as '4th and 5th graders do well at global collaboration' and 'teachers need to want to connect'; values included 'important to share student work', 'success in a global society relies on developing collaborative skills and empathy for others'; and beliefs included 'teachers need to provide students with choices in learning', 'students love to collaborate'. One interview proved more challenging when writing up because the transcript responses seemed quite trite, and in fact the interviewee was known to me so I found what she had to say very obvious: I had heard it before in different formats. However, the In Vivo, process and values coding resulted in a long list of unique words, subjective statements of process and assigned values on the statements by the interviewee.

The final Coding Playbook used in this study for data analysis and coding within NVivo is shared in Appendix 3 where a full description of each code is provided including code name, label and description. Figure 3.3 reveals the essential code map for the three key themes. A further example from the playbook (Figure 3.4) shows the granularity of sub-categories for the first theme of 'educator experiences'. The three main categories namely education context, online learning in the classroom, and professional learning have been extended into further subcategories, and some of these have been extended even further into additional sub-sub-categories. Further to this, the sub-category of online global collaboration is an interesting one to discuss where further sub-categories are found 'personal barriers', 'situational barriers', 'personal enablers', 'situational enablers', and 'online global collaboration outcomes', as shown in Figure 3.4. In an earlier phase of coding the sub-subcategories of online global collaboration were simply 'barriers', 'enablers' and 'outcomes'. Further coding, using the methods described already, revealed a division between personal and situational barriers and enablers. This is shared as part of the data presentation in this chapter and discussed more fully in Chapter 6.
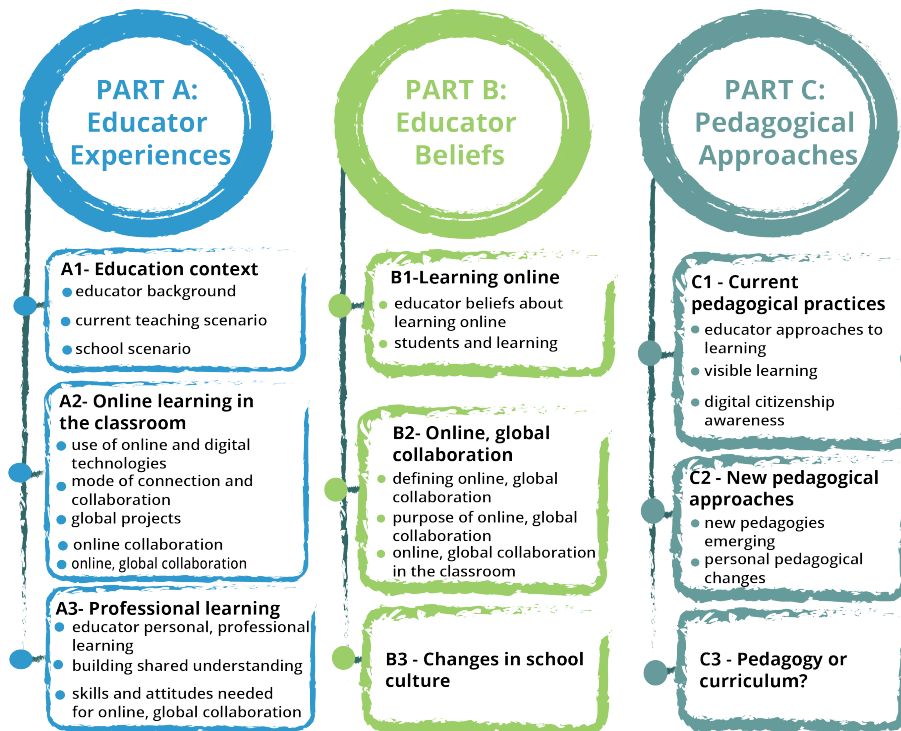
Figure 3.3. Coding schedule map: Parts A, B and C

Figure 3.4. Coding schedule map Part A: Educator experiences

Part B: Educator beliefs and Part C: Pedagogical approaches, are shown in Figure 3.5 and Figure 3.6 below.
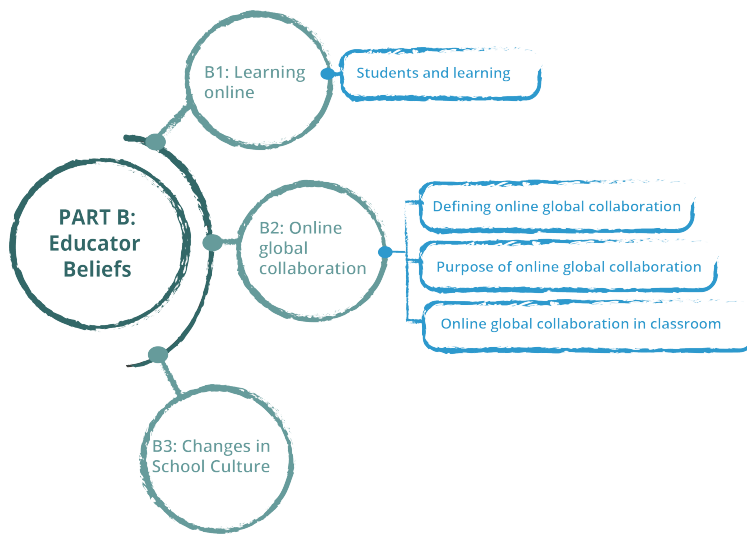
Figure 3.5. Coding schedule map Part B: Educator beliefs
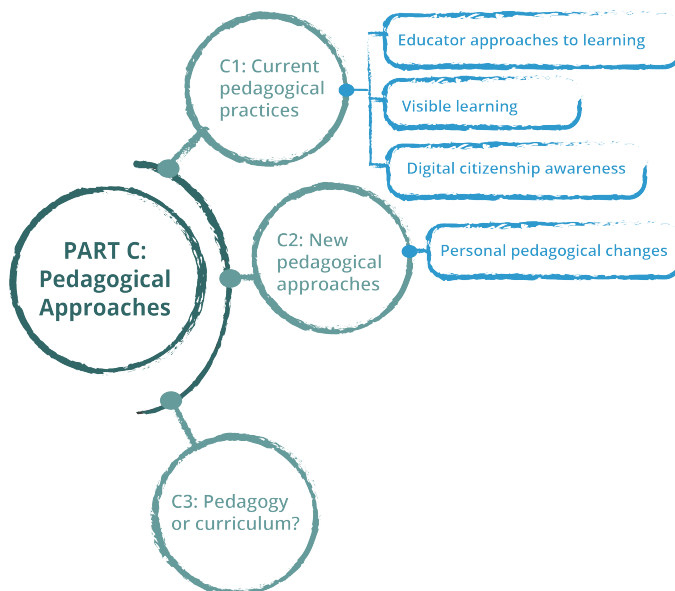
Figure 3.6. Coding schedule map Part C: Pedagogical approaches

3.7.2.3 Memos and freewriting.

An important part of data analysis and synthesis is the use of memo writing and freewriting around the ideas and concepts found in the data (Charmaz, 2014). Freewriting, as a non-linear technique for getting unordered thoughts down, was used in this research as part of data analysis and presentation of the interview material. Short, quick (up to 10 minutes at a time) periods of writing helped to spark ideas that led to further writing and synthesis.

Memo writing came out of a grounded theory approach to data analysis (Charmaz, 2014). Memos are often used to describe a situation or person or thing and are the pivotal intermediate step between data collection and writing drafts. Charmaz considers qualitative research as open-ended and therefore that memos can be used to open ideas and identify gaps in research. According to Miles et al. (2014) an analytic memo can be brief or extended with a purpose of documenting the researcher's reflections and thinking processes about the data. More importantly, memos are about ideas and should be part of the ongoing process of sifting and sorting and synthesising data right up until thesis completion.

As a researcher, I found the practice of 'memoing' or 'journaling' helped define each topic and category for the data analysis structure (hence, creation of the coding playbook). This practice was instrumental to sifting through ideas in a more organised way leading to original output from the research. Here is an example of a short memo written in September 2017 when I attended a workshop led by Kathy Charmaz:

> Two factors - ability and willingness - influence the adoption of new learning modes by educators. An online global collaborative educator can adopt a willing attitude conducive to implementing things differently. This is not ageist, but may develop through experiences and opportunity to grow as a practicing professional. This relates to the work of Ertmer (add date) in terms of implementing online global collaboration, whereby educators are able to navigate challenges to do with hardware and software and Internet access but fall short of adopting real pedagogical change.

3.7.2.4 Visual profiles of global educators.

In conjunction with text-based analysis, I implemented a visual approach when sharing profiles of the interviewed online global collaborative educators. The graphic reconstruction of knowledge through visual mapping techniques has numerous benefits (Eppler, 2006) including positive effects of creative struggle leading to enhanced learning outcomes (for the researcher) while engaging in the process of concept mapping (Novak & Canas, 2007). Constructivist epistemology in the past 50 years sees knowledge as a human construction and visual mapping can facilitate this (Novak & Canas, 2007). Identifying concepts and their multiple relationships became my own creative struggle through analysis of interviewee transcripts. Saldaña (2013) discusses creativity as a necessary personal attribute for coding,

including the ability to think visually and in metaphors. Based on data analysis, the use of metaphors was applied as a conceptual tool and creative way to personalise each educator (Midgley & Trimmer, 2013). Through visual and descriptive analytical methods, qualities of each educator were identified. Details and confirmation of who each educator is, what they do, how they relate to others, their leadership ability, and of course their disposition to and activities with online global collaboration were featured in a way that was reviewed and understood quickly through summation and visualisation.

3.7.3 Potential outcomes of analysis.

The purpose of this case study was not to treat each data source independently and report findings separately. As the researcher, I needed to ensure that the data converged in an attempt to understand the overall case, not the various parts of the case, or the contributing factors that influence the case (Baxter & Jack, 2008). Yin (2014) advises thinking about the 'case' (in this study, that being online global collaboration) as an opportunity to shed light on theoretical concepts or principles.

Yin (2014) discussed the role of theory in analysing results and referred to analytic generalisation. He noted that generalisations do not just contribute to abstract theory building and they may potentially apply to a variety of situations far beyond any 'like-cases' represented by the original case. The design of this case study was based on theory or theoretical propositions related to constructive, connected and collaborative learning. Through analysis of the case study's findings new analytic generalisations may emerge that may corroborate, modify, reject or otherwise advance theoretical concepts referenced in case study design, or new or 'rival' concepts might arise. Yin (2014) concluded that analytic generalisation will be at a higher level than that of the specific case, regardless of whether it was derived from conditions specified at the outset or at the conclusion of the case study.

3.7.4 Data analysis issues.

According to Yin (2014) high quality analysis of data has four underlying principles, that need to: 1) attend to all the data; 2) address all plausible rival interpretations; 3) address the most significant aspect of the case study; and, 4) use

prior personal, expert knowledge in the case study. The fourth and last point was problematic for me as a principle in relation to my analytic strategy. One main concern with the data analysis was being able to take a non-biased stance, and to identify important aspects for others. I questioned the equal importance of data and I questioned how to make valid and rational cross-references between each embedded unit of study (or interviewee) in the case study when a semi-structured approach is being taken during the interview.

According to Twining, Heller, Nussbaum, and Tsai (2016), issues with qualitative research are threefold, namely: the lack of analysis; where data is paraphrased (in a narrative version) rather than interpreted; and a failure to provide sufficient examples from the data. Interpretation of interviewee data in this study was done partly through the presentation stage (Chapter 5), and specifically through the findings (Chapter 6). An important approach was presenting the educators' voices as clear records of current practice, achievements and approaches to online global collaboration in the classroom. Therefore, numerous quotes are interspersed in Chapter 5 as part of the extended narration offered by each of the interviewed educators.

3.8 Ethical Issues and Procedures

Research ethics involves avoiding bias and striving for the highest ethical standards (Yin, 2014). It also includes a responsibility to scholarship, honesty, accuracy, striving for credibility, and identifying limitations to the work. For this research informed consent, completed in two stages, was gained from all persons available and willing to be interviewed. In the Phase 1: Online survey, Part C, educators interested in being considered for Phase 2: Semi-structured interviews (case study) provided consent by proceeding to share identifying demographic information. Prior to the interviews consent forms were sent to selected consenting educators for signing. This consent form detailed all aspects of the semi-structured interview process including how data was to be stored, used and kept private.

The openness of Phase 2 data collection meant there was possibility of bias given that some of the participants already had a professional relationship with me

through past or current online global collaborations. As the researcher, my goal was to interpret the data and make inferences according to this interpretation mindful of contradictions and inconsistencies (Yin, 2014). According to McGregor and Murnane (2010), validity and reliability are used in post-positivism as tests of rigour. In more recent qualitative research methodology, these terms are replaced by truthfulness, credibility and trustworthiness (Twining et al., 2016), however in this study I have chosen to use the more standard terms of 'validity' and 'reliability'.

3.8.1 Validity.

In qualitative research validity involves techniques or methods to ensure the researcher's claims about knowledge can be aligned with the reality being studied (Cho & Trent, 2006). As an interpretive study, it could be argued that 'validity' is not an appropriate term, although it suggests a more rigorous stance towards the research (Miles et al., 2014). Researchers' construction of realities will inevitably be reconstructions, or interpretations and that a variety of purposeful approaches may be combined holistically to obtain valid results (Cho & Trent, 2006).

Member checking, also known as informant feedback (Onwuegbuzie & Leech, 2007), was employed at the interview transcript stage as a strategy to involve participants in the research process and to establish credibility (Carlson, 2010). Interviewees in this research were sent full transcripts and asked for feedback on accuracy of intention. They also had the opportunity to contribute further ideas and thoughts. This process took place before any data analysis by the researcher. It is noted that not one participant added additional material, and all were satisfied with the transcript as an accurate record of the interview. Data analysis therefore became a narrative interpretation of the interviews, which involved continual revisiting, and reworking of the data (Carlson, 2010).

According to Creswell and Miller (2000) the lens of the researcher in conjunction with researcher paradigm assumptions help determine choice of validity procedures. Therefore, within my interpretivist/constructivist paradigm, validity procedures also included thick rich description of the data (Creswell & Miller, 2000). Thick rich description applies to the construction of texts that are richly descriptive

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and pertinent to the interviewee. This is an holistic approach with a focus on extricating unique, idiosyncratic meaning and perspectives from individuals (Cho & Trent, 2006). Maxwell (1992) called this 'interpretive validity', while Flyvbjerg (2006) considered a narrative approach where the data is 'thick' and hard to summarise is not a problem with case study research. Onwuegbuzie and Leech (2007) viewed thick and rich descriptive material where data are detailed and complete, and understanding is maximised as an important way of providing credibility of findings.

Another validity procedure is researcher reflexivity where the researcher self-discloses any beliefs and biases that may shape the inquiry (Creswell & Miller, 2000). Mabry (2008) stated that in interpretivist research, subjectivity may complicate the analysis. The section earlier in this chapter on researcher bias identified and allayed potential threats to validity, based on the absence of disconfirming evidence (Creswell & Miller, 2000), and exists in conjunction with an approach to data presentation that is narratively rich and embedded with quotes. In relation to researcher reflexivity, Morse, Barrett, Mayan, Olson, and Spiers (2002) argued qualitative researchers should reclaim responsibility for reliability and validity by implementing rigorous and ongoing verification strategies. This applies to checking and rechecking data, and in this study, ensuring data in Phase 1 was checked sufficiently to enable suitable candidates for Phase 2, and that researcher bias or assumptions are minimised when making final selections.

3.8.2 Reliability.

Reliability of the research refers to whether the process of the study is consistent, stable and maintains quality and integrity (Miles et al., 2014). A reliable and dependable study is based on careful documentation of research design. For this research, where a single case study design was used, protocol established for each of the embedded units ensured that interviews were organised and presented in a logical and meaningful way (Audet & d'Amboise, 2001). This included:

- Sending each interviewee a document detailing the process of the interview and the questions that would likely be asked;
- Sharing formal details about the purpose and focus of the interview at the start of each interview; and

- Acknowledging and confirming that the interviewee had an opportunity to read the transcript of the interview thereby attesting to its reliability.

More recently, researchers of the constructivist/interpretivist position prefer labels distinct from quantitative approaches such as 'trustworthiness' (Creswell & Miller, 2000). This involves ensuring enough detail is provided so readers can assess the validity of the work (Baxter & Jack, 2008) in terms of credibility, transferability, dependability and confirmability (Creswell & Miller, 2000). In this study the research question was clearly written; research design appropriate to answer this question; sampling strategies purposeful to the design; collection and management of data was systematic; and analysis protocols established and followed.

3.9 Summary

This qualitative study investigated the lived experiences of K-12 educators who implement online global collaborative learning. The research used a post-positivist paradigm guided by an interpretivist lens. A single case study design with embedded units was implemented where the phenomenon was identified as online global collaboraiton. The open online survey for Phase 1 of the research design provided for a select number of K-12 educators who indicated application of online global collaboration in their learning environment, to be invited for Phase 2 research data collection via an online interview. Educators from different countries and education systems were included as part of the holistic, global objectives of the research.

The next chapter will reveal data collected through the Phase 1: Online survey and share the process that informed suitable educators for the Phase 2: Semi-structured interviews.

CHAPTER 4 - INTRODUCING K-12 EDUCATORS WHO IMPLEMENT ONLINE GLOBAL COLLABORATION

4.1 Introduction

This chapter shares the details about the search for online global collaborative educators and profiles the participants in this study. It narrates the process of selecting, then inviting research participants and presents pertinent data from Phase 1: Online Survey, of the data collection process. The presentation and analysis of the Phase 1 data is followed by a detailed description of how participants for Phase 2: Semi-structured interviews were selected. The subsequent interview structure and alignment with research questions is discussed. Finally, the online global collaborative educators case study data from Phase 2 are summarised as an overview and introduction to Chapter 5, where complete interpretive data from the Phase 2: Semi-structured interviews is presented.

Global representation from educators with a range of different backgrounds, locations and experiences was an important goal for this study. Research outcomes could not be as rich or have as much potential if discussion about online global collaboration was based around data that was 'local' in terms of coming from one or two countries or one or two areas from within the same country. Therefore, the narration in this chapter shares specifically how research design supported approaches that attracted participants from diverse situations and locations in K-12 schools.

4.2 Introducing Online Global Educators: Phase 1 Survey Data

A critical part of data collection and analysis included a search for practising online global collaborative educators. I wanted to find educators who had knowledge and understanding of global collaboration in an online context in conjunction with the experience of implementing online global collaborative learning for their

students over an extended period. Data collection started with the Phase 1: Online Survey (see Appendix 1). This was an open survey in that it could be accessed online by anyone who had the URL, an internet connection, and was able to open Google Forms. I used my personal online global network of educators to help promote and invite colleagues to respond to the survey. This strategy included sending out tweets using a mixture of education hashtags; sending messages through the Flat Connections educator community; and posting on education pages and groups on Facebook and LinkedIn.

The online survey, designed in three parts, asked participants to share ideas and understandings about, involvement in and practices with online global collaboration and the use of digital technologies. It also introduced them to the Taxonomy of Global Connection (see Appendix 2) and encouraged responses based on interpretation of this tool as a lens for their own practices. Likert scales were used for some of the survey questions with the intention of prompting an opinion rather than a yes/no answer. They are easy to read and complete for participants, although may demonstrate acquiescence or central tendency bias (Albaum, 1997). The Phase 1: Online survey was open for over two months and collected 69 responses. Of these, 65 met the criterion of K-12 educators and it is the data from these 65 that are the focus in this chapter. In the following section, data from Phase 1, Parts A, B and C are presented and analysed, introducing the participating educators and revealing how Phase 2: Semi-structured interviewees were selected.

4.2.1 Phase 1: Online Survey – Parts A and B.

Parts A and B of the online survey required anonymous responses. Questions included demographics for age and number of years teaching as well as experience in and application of online learning and global collaboration.

4.2.1.1 Participant demographics.

Participants from 11 nationalities completed Parts A and B of the online survey, as shown by Figure 4.1. The 'other' in this figure included Iran, Lebanon, Mexico, Norway, Pakistan, Sweden and the United Kingdom. Of the 65 respondents to the nationality question, 63 shared they currently resided across 17 countries, indicating

some respondents were not working in their home country at the time data were collected.
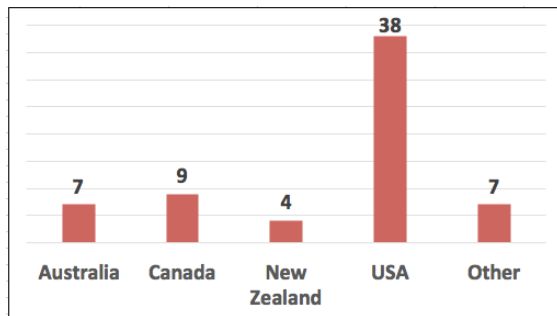
Figure 4.1. Phase 1: Q.2 Nationality of Educators (n=65)

The data complexity is magnified by responses from educators beyond the borders of one country in a variety of institutional situations and teaching levels within a K-12 context. Given that a variety of educators responded to the online survey it was likely that an interestingly varied subset of candidates would therefore be eligible for the interview stage of Phase 2.

The age range of survey participants is represented in Figure 4.2, and shows a predominance of older educators responded, with 41 (27+14) (63%) of the 65 respondents in the 40-59 overall age range, and 49 (75%) are of age 40 and above, while 34% are of age 50 and above.
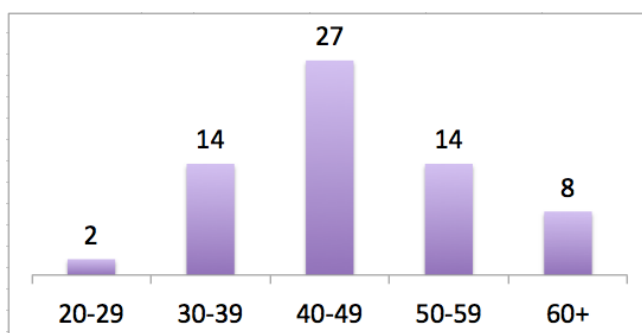
Figure 4.2. Phase 1: Q.4 Educator age (n=65)

As well as gathering responses from educators who are generally older, Figure 4.3 shows the participants overall have many years of experience in the classroom with 42 (65%) having taught for 16 years or more. This may mean that more experienced educators are comfortable with the teaching process and are ready to

experiment or try new approaches to teaching and learning. They could be looking for new ideas and different experiences for themselves and their students.
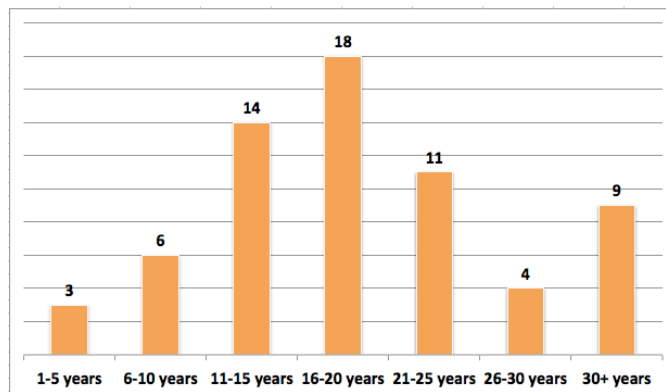
Figure 4.3. Phase 1: Q.5 Educator number of years teaching (n=65)

The data shared in Figures 4.2 and 4.3 may also mean that participants who have been teaching longer are more settled across the realm of educational expectations in the classroom and perhaps are more comfortable and fluent with technology, and ready to take on new challenges. It is evident from the data that not as many younger educators as older educators responded to the online survey: this raises further questions. Are the younger educators not as networked and did not find the survey, or is it assumed that they do not have the experience and/or the technology understanding to implement online global collaboration? This may lead to a discussion about pedagogical understanding and classroom experience. Dealing with discipline, curriculum development, assessment and other items may support the hypothesis that more mature educators are ready and willing to take on additional strategies/pedagogies for learning that include online global collaboration.

4.2.1.2 Participant use of technology for online learning and global collaboration.

A number of questions in the Phase 1: Online survey prompted responses regarding use of technology for online learning and global collaboration. The purpose here was to gain some understanding through open responses regarding what the educators thought were important tools juxtaposed with to what they had access personally and in the classroom. Survey questions 6 and 8 asked for information about personal and student use of synchronous online technologies.

Participants were informed in the survey instructions that, "Synchronous refers to something happening in real time, occurring at the same time such as a real-time online virtual meetup or a live chat or online discussion".

Figure 4.4 shares the key tools identified by the participants for synchronous online communication. These are Skype, Google Hangout, Zoom, Adobe Connect, Fuze, Blackboard Collaborate, and Twitter. Most common for personal synchronous online learning are Skype 48 (74%), Google Hangout 44 (68%) and Blackboard Collaborate 38 (58%), while a low number of respondents 6 (9%) claimed to use Twitter, or replied 'none'. For student synchronous online learning, Skype 54 (83%) is the most common response with other tools shared including Google Plus, Gototraining, Moodle, YouTube, Facetime, WebEx, Facebook, My Big Campus, Kidblog, OpenSim and Second Life.

	Skype	Google Hangout	Zoom	Adobe Connect	Fuze	BB Collab	Twitter	None	Other
Personal Learning	48	44	3	21	14	38	6	6	20
Student Learning	54	28	1	4	5	13	0	5	18
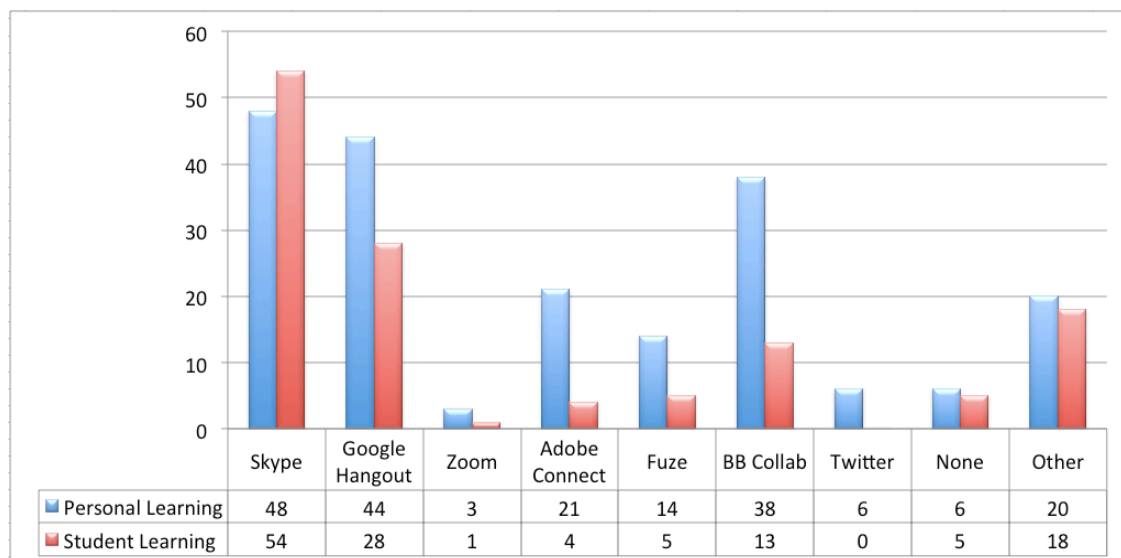
Figure 4.4. Phase 1: Q.6 & 8 Synchronous online technologies for personal and student use (n=65)

In survey questions 7 and 9, participants were asked to share an example of how they used synchronous technologies for personal learning and student learning respectively. Examples for personal synchronous learning (question 7) included the use of video conferencing with friends around the world and for study purposes; Blackboard for online study; participation in online conferences using Adobe Connect; Google Hangouts to discuss specific PD topics; and participation in Twitter chats to ask questions and share ideas with colleagues from around the world (such as #satchatoc and #histedchat).

Examples for student synchronous learning (question 9) included conducting meetings with students in both Fuze and Blackboard Collaborate to support online global collaboration; Skype to be present in the classroom even when not physically present; Google Hangouts to assist students with homework or for tutoring during after school hours; and a student led initiative in which the students prepared presentations about topics of personal interest and then shared them with other students using Blackboard Collaborate, thus allowing the other students to ask questions.

The use of asynchronous online technologies for personal and student use is the focus of questions 10 and 12 in the survey. Participants were informed that, "Asynchronous refers to something not existing or occurring at the same time such as a co-edited wiki or discussion forum or collaborative Google doc". As shown by Figure 4.5, tools identified for personal and student asynchronous use are wiki, blog, Google docs, Voicethread, Edmodo, and Padlet. Other tools include Moodle, podcast (generic), Twitter, FaceBook, Tackk, Animoto, Mahara, OneNote, Blackboard, Weebly, Mathletics, and Glogster. Responses for personal and student use of tools were highest for Google docs 57 (88%) and 47 (72%) respectively, and a blogging platform, 53 (82%) each. Educator use of wikis is higher than for student use, 44 (68%) for personal learning compared with 26 (40%) for student learning, possibly showing these were being used for presentation purposes or teacher-to-teacher collaboration rather than for student collaboration.

	Wiki	Blog	Google docs	Voiceth read	Edmodo	Padlet	None	Other
Personal Learning	44	53	57	22	39	29	3	15
Student Learning	26	53	47	24	32	36	2	20
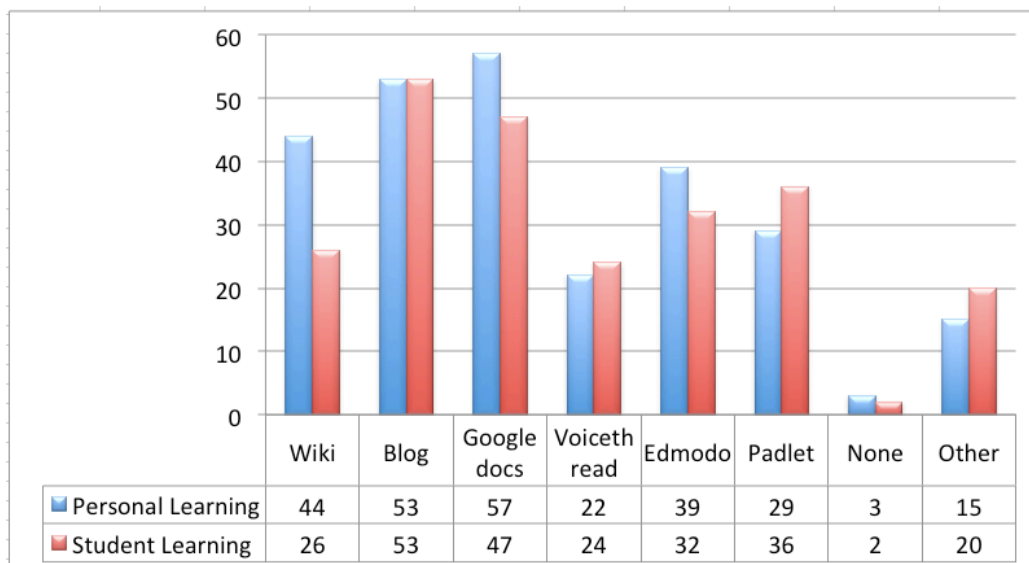
Figure 4.5. Phase 1: Q.10 &12 Asynchronous technologies for personal and student use (n=65)

In questions 11 and 13, participants were asked to share an example of how they used asynchronous technologies for personal learning and student learning respectively. Examples for personal learning using asynchronous technologies (question 11) included the use of Feedly to follow relevant bloggers; a personal blog to reflect on teaching and learning, and to share experience with an authentic international audience; Twitter, Google+, YouTube Channel and Edmodo to connect with personal learning networks; and district collaboration via Google docs for curriculum planning, faculty meetings, and tutorials.

Examples for student asynchronous learning (question 13) included the use of Edmodo as a virtual classroom space for both internal classroom and global classroom activities; blogging with students and developing a digital portfolio and a space for reflection of learning; Google Drive to work on collaborative writing in presentation projects; and Padlet to facilitate student debates by having students choose a side and drag their comment to that side of the Padlet wall.

In addition to the shared use of online technologies, personal responses were prompted from participants based on both comfort level and skill level when implementing technologies. This was to determine willingness to try new ideas (comfort level) and understanding of and experience in the use of technologies for learning and online global collaboration (skill level). In line with this goal, questions 17 and 19 asked for responses related to 'comfort level' when implementing online technologies for learning and for online global collaboration. Figure 4.6 shows that for both questions most responses were in the 'very comfortable' 62 (49%) and 'comfortable' 49 (39%) ranges. When these two levels are combined, 53 (84%) of participants indicated they were very comfortable or comfortable when implementing online technologies for learning whereas 58 (92%) claimed to be more comfortable when implementing online global collaboration. This is an interesting 'aberration' and one question is whether the use of online technologies would logically precede a comfort level with online global collaboration. Participant interpretation of the question and perceived understanding of the use of online technologies for global collaboration may have influenced outcomes here.

	Very comfortable	Comfortable	Uncomfortable	Very uncomfortable	Not sure
■ Comfort level when implementing online technologies for learning	33	20	1	7	2
■ Comfort level when implementing online global collaboration	29	29	2	1	2
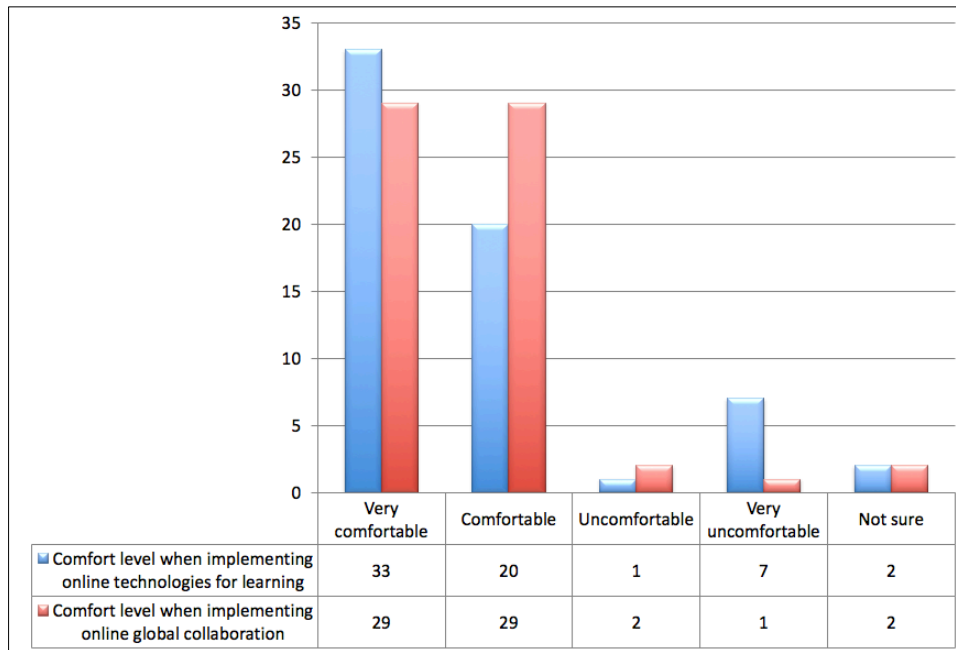
Figure 4.6. Phase 1: Q.17 & 19 Comfort levels of educators implementing online technologies (n=63)

	Excellent	Above average	Average	Below average
■ Skill level with online technologies for learning	21	34	7	1
■ Skill level with technologies for online global collaboration	18	32	11	3
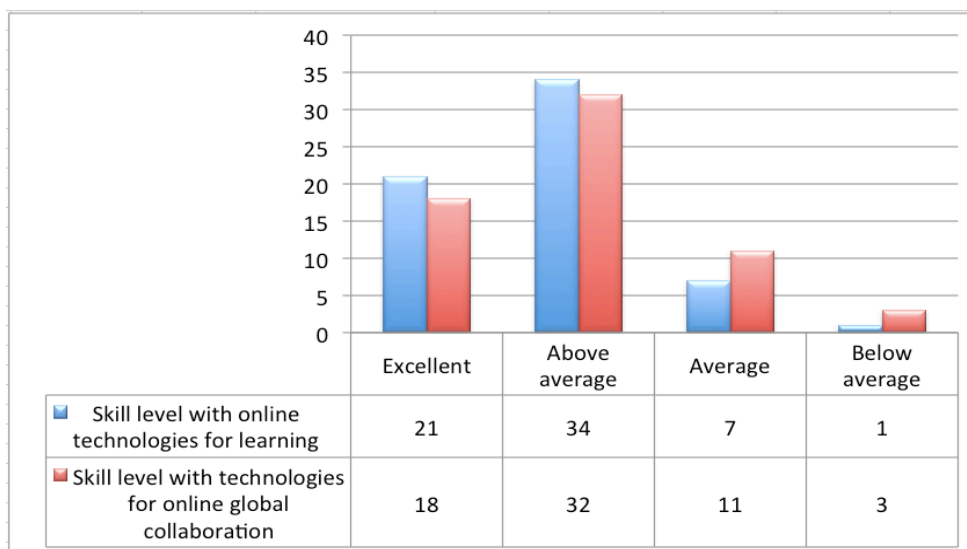
Figure 4.7. Phase 1: Q.18 & 20 Perceived skill level with online technologies (n=63)

Further, questions 18 and 20 asked for responses describing skill level with online technologies and with technologies for online global collaboration. Figure 4.7 reveals that the vast majority of participants rated themselves as having 'excellent' 39 (31%) or 'above average' 66 (52%) skills in these areas respectively. When these two levels are combined 55 (87%) claimed to have 'excellent' or 'above average' skill with online technologies for learning, while 50 (79%) claimed to have the same skill levels when using technologies for online global collaboration. The data around

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comfort and skill level were affirmation that the survey had attracted educators who used online technologies with some ability in the classroom.

4.2.1.3 Participant responses about being a global educator and collaborator.

When asked what it meant personally to be a global educator and a global collaborator, survey participants provided diverse and complex narrative responses. These highlighted attributes of educators who implement online global collaboration.

Question 14 on the survey, *"In what ways do you consider yourself a global educator?"* related to the research sub-question concerning educator experiences and online global collaboration. I was looking for ideas and practices that indicated a sense of global participation through networks and team participation in addition to evidence of global awareness through practical applications in the classroom that may lead to intercultural understanding through working with others. Selected responses to question 14:

- A global educator is a risk taker that's willing to go out on a limb to reach students, parents, and colleagues with creative ideas and projects to give students an opportunity to become internationally minded learners. Collaboration is the key to helping a global community to take place.
- Teaching biology, I try to make my students aware of both global issues and of global cultures.
- I teach for differentiation and maintaining a global perspective when approaching tasks. I incorporate diverse materials and encourage students to think beyond their own lives when reading and writing.
- Work together with students, professionals, and classrooms to work as part of teams to address and solve problems of global significance as it relates to the lives of participants.

When asked in question 15, *"In what ways do you consider yourself a global collaborator?"* participants shared not only classroom practice but a broader sense of self and their place in the world, impacting research sub-questions one (educator experiences) and two (beliefs about teaching and learning). Selected responses to question 15:

- I have initiated projects with classrooms from different parts of the world to work with my students. I continue to seek educators to collaborate with on projects. In the past, I have participated in a number of global projects set up by other educators.

- Sharing ideas with teachers around the world makes me a global collaborator.
- I am a global collaborator in my desire and openness of 'other'. I know there is so much that I do not know, and as an American, I feel at a disadvantage in the 'worldly' sense, meaning it seems that other countries are better at teaching the 'world' and the US teaches us as the 'world' and often neglects all outside of the USA. I want to expose my students to the broader world and all it has to offer, which motivates me to reach out and expand their horizons, as well as my own. I believe the hearts of educators across the globe are a bonding factor and we truly are stronger when we reach out to one another and share and celebrate one another.
- I have worked collaboratively with other educators around the world to provide rich learning opportunities for students in my care.

Question 16 on the survey asked, *"Please share your definition of online global collaboration in 2-3 sentences"*. Representative responses below continue to support educator experiences (research sub-question one) and impact research sub-question three regarding educator pedagogical approaches and the value placed on online global collaborative practice.

- As a teacher my role in online global collaboration is to facilitate opportunities for my students to see that there is a bigger world than what is just outside their door. Online global collaboration allows for sharing of ideas and philosophies to strengthen our students learning and get them ready for a world where there is constant access to online global collaboration.
- Online global collaboration is where teachers and students work together to co-plan, co-teach and co-learn about any topic. It creates an opportunity to learn WITH each other instead of learning ABOUT each other. These collaborations foster cultural understanding and strengthen ties between students from around the world.
- Online collaboration is the sharing of resources through the use of technologies to achieve improved learning opportunities for students, which provide a wider perspective than would otherwise be available.
- Online global collaboration is the act of co-discovering the community, with whom you are going to work, play and struggle through the world's greatest challenge. It is the relationships through which we discover the similarities we all share, regardless of time, place or culture.

The Phase 1: Online survey also elicited responses related to participant perceived barriers and enablers to online global collaboration. Questions 21 and 22 were designed in a matrix style using a Likert scale based on six possible barriers (question 21) and five enablers (question 22). The six barriers provided on the survey

were 'technology infrastructure', 'technology access', 'technology fluency' (ability to work with the technology), 'digital citizenship skills', 'curriculum design', and 'lack of understanding about the benefits of global collaboration'. The five enablers were 'having an effective personal learning network (PLN)', 'finding a reliable partner', 'learning standards and frameworks', 'curriculum design', and 'Web 2.0 tools' (such as wikis, blogs). Both the barriers and enablers lists came from the literature where they are discussed as key areas in which educators struggle to integrate technology in order to be able to collaborate globally (An & Reigeluth, 2011; Ertmer et al., 2012; Greenhow et al., 2009; Kim et al., 2013; Laurillard, 2009, 2012; Oran, 2011).

4.2.1.4 Perceived barriers to online global collaboration.

Participants responded to question 21, *"In the school context and in your personal experience how often have the following inhibitors or barriers impacted online global collaboration?"* This question used a 6-point Likert scale ranging from 'never' to 'almost always' including 'not sure what this means'. As shown by Figure 4.8, 'technology infrastructure' 23 (36%), 'technology access' 19 (30%), and 'curriculum design' 16 (25%) are the barriers that 'almost always' or 'often' impacted. The 'sometimes' response had higher levels than other responses in most barriers, (with the exception of 'lack of understanding about the benefits of global collaboration' - 12 responses only for the sometimes category), possibly indicating that there were intermittent frustrations in all five areas. This is balanced with options that are never or seldom seen as barriers, as shown by combined numbers for 'lack of understanding about the benefits of global collaboration' 38 (59%), 'digital citizenship skills' 35 (55%) and 'curriculum design' 27 (42%). In summary, educators understood the benefits of online global collaboration and were developing digital citizenship skills however, the top three barriers that impacted participation were school-based, and apart from curriculum design, largely out of the direct control of the educator in the classroom, namely technology infrastructure and technology access.

	Technology infrastructure	Technology access	Technology fluency	Digital citizenship skills	Curriculum design	Lack of understanding about the benefits of global collaboration
Almost always	6	5	3	3	1	5
Often	17	14	11	6	15	7
Sometimes	28	23	19	19	21	12
Seldom	8	13	22	20	16	12
Never	5	9	9	15	11	26
Not sure what this means	0	0	0	1	0	2
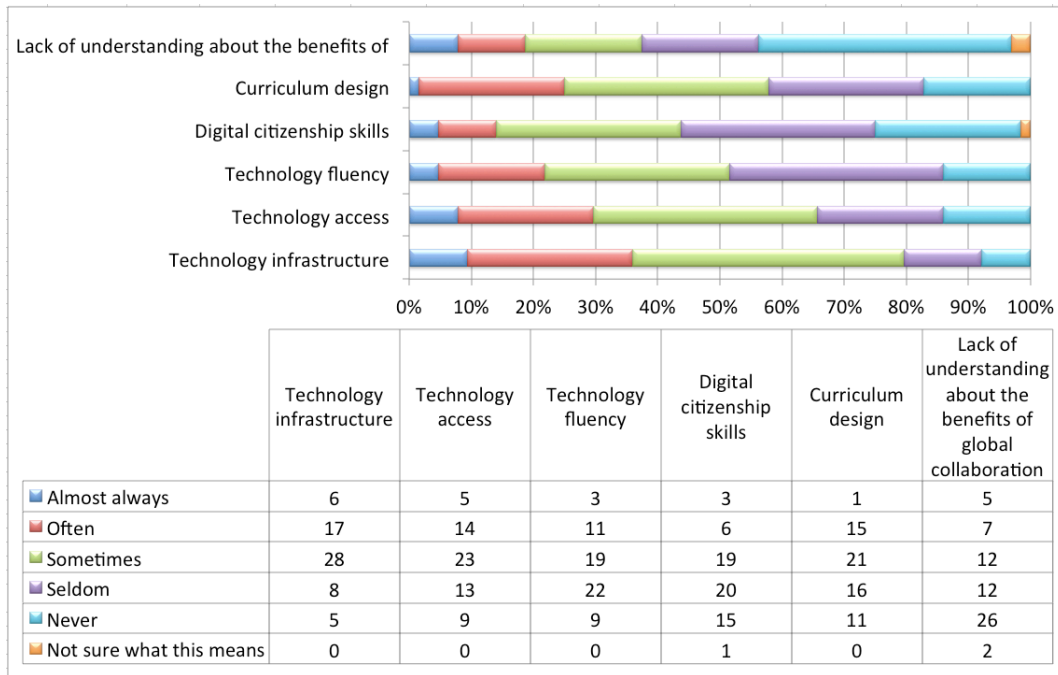
Figure 4.8. Phase 1: Q.21 Barriers that impact online global collaboration (n=64)

4.2.1.5 Perceived enablers to online global collaboration.

Participants responded to question 22, *"In your experience how important are the following enablers to online global collaboration?"* This question used a 6-point Likert scale ranging from 'not important' to 'very important', including 'not sure what this means' as a possible option. As shown by Figure 4.9, ratings for 'very important' and 'important' were highest for 'finding a reliable partner' 61 (95%), 'Web 2.0 tools' 54 (84%) and 'having an effective PLN' 52 (81%). 'Learning standards and frameworks' 30 (47%) and 'curriculum design' 28 (44%) were the highest rated for combined 'moderately important' and 'slightly important' categories.

Key enablers of finding reliable partners and having an effective PLN indicated educators were networking and forging valuable connections for global collaborative learning. Preference for the use of Web 2.0 tools aligns with a changing classroom landscape and educator ability to choose appropriate tools.

	Having an effective personal learning network (PLN)	Finding a reliable partner(s)	Learning standards and frameworks	Curriculum design	Web 2.0 tools
■ Very important	27	39	7	11	22
■ Important	25	22	18	23	32
■ Moderately important	6	2	19	20	8
■ Slightly important	4	1	11	8	2
■ Not important	2	0	8	2	0
■ Not sure what this means			1		
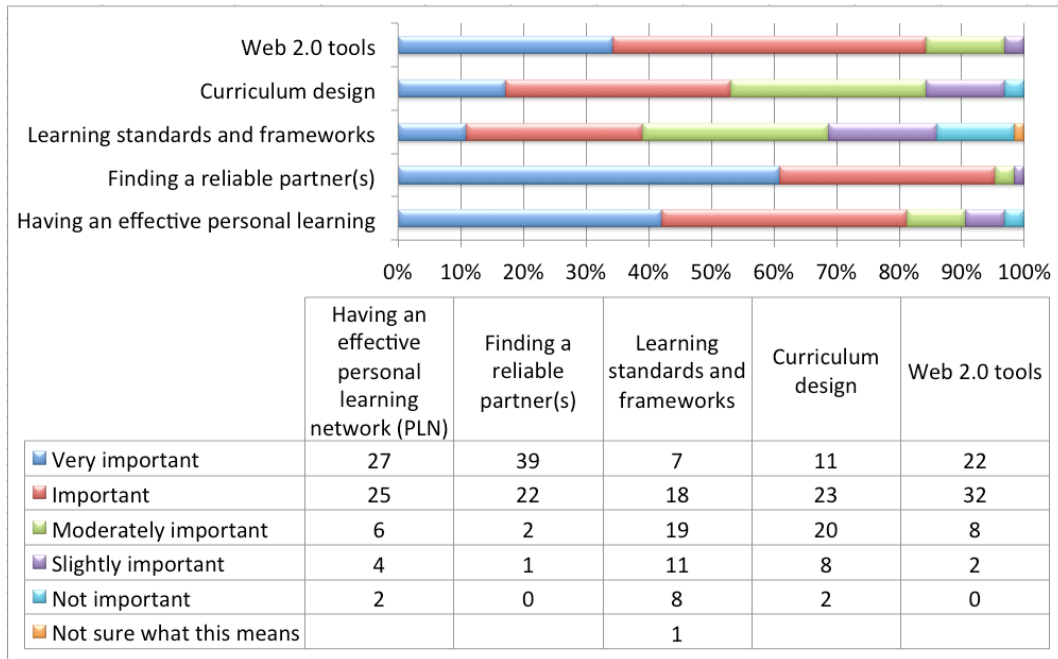
Figure 4.9. Phase 1: Q.22 Enablers that impact online global collaboration (n=64)

4.2.1.6 Implementation of online global collaboration.

The Phase 1: Online survey asked participants to categorise their online global collaborative practices in terms of frequency of implementation and type. Part B, question 23 asked, *"Which of the following best describes the frequency of implementation and type of online global collaborations that you implement in your learning environment?"* It used a 6-point Likert scale to determine whether each category was implemented 'very frequently' through to 'never', with an option also to respond 'not sure what this means'. There were 10 categories including synchronous, asynchronous, across time zones, collaborations that were <six weeks and >six weeks, and student-managed projects.

In order to show this data more clearly, two graphs have been created: Figure 4.10 and Figure 4.11. In Figure 4.10, data are shared regarding asynchronous global collaborations across time zones or within the same or similar time zone. In Figure 4.11, data are shared regarding the learning objective (teacher designed and managed, students connect and collaborate directly, or student managed) and whether the project is less than or more than six weeks in length.

	Same or similar time zone synchronously	Same or similar time zone asynchronously	Across time zones synchronously	Across time zones asynchronously
■ Very frequently	4	4	1	3
■ Frequently	14	22	11	18
■ Occassionally	29	21	32	26
■ Rarely	8	9	9	13
■ Very rarely	6	5	7	2
■ Never	3	3	4	2
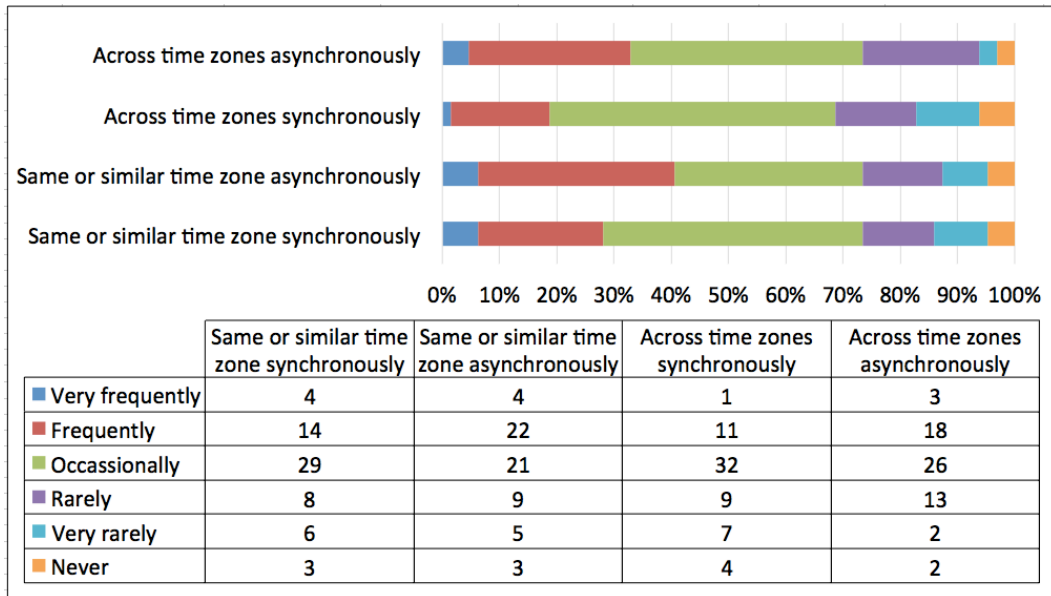
Figure 4.10. Phase 1: Q.23 Synchronous and asynchronous implementation by frequency (n=64)

	Designed & managed project <6 weeks long	Designed & managed project >6 weeks long	Students connect & collaborate directly with each other <6 weeks long	Students connect & collaborate directly with each other >6 weeks long	Student managed global collaboration <6 weeks long	Student managed global collaboration >6 weeks long
■ Very frequently	3	2	1	2	1	0
■ Frequently	9	8	11	6	4	5
■ Occassionally	33	16	27	20	11	8
■ Rarely	6	18	8	12	11	12
■ Very rarely	5	11	7	13	8	10
■ Never	8	9	10	11	28	28
■ Not sure what this means	0	0	0	0	1	1

Figure 4.11. Phase 1: Q.23 Length and objective of online global collaboration (n=64)

Additional data regarding question 23 are shown in Table 4.1 (note this combines all data from Figure 4.10 and 4.11). Combined figures for 'very

frequently' and 'frequently' account for 129 (20%) of all responses; for 'occasionally', 223 (35%); and, for combined 'rarely', 'very rarely' and 'never' 286 (45%). The most frequent types of online global collaboration, according to the data, are asynchronous in same, similar and across time zones (94 combined responses for both Category 1 and Category 2).

Table 4.1

Q.23 Frequency and Type of Online Global Collaboration Implemented in the Learning Environment - Data Ranking

Category 1: 20% Combined 'very frequently' and 'frequently' *(responses = 129)*	Category 2: 35% 'occasionally' (responses = 223)	Category 3: 45% Combined 'rarely', 'very rarely' and 'never' *(responses = 286)*
• Same or similar time zone - asynchronously (26) • Across time zones - asynchronously (21) • Same or similar time zone - synchronously (18) • Across time zones - synchronously (12) • Global collaboration students connecting <6 weeks long (12) • Designed and managed project <6 weeks long (12) • Designed and managed project >6 weeks long (10) • Global collaboration students connecting >6 weeks long (8) • Student managed global collaboration <6 weeks long (5) • Student managed global collaboration >6 weeks long (5)	• Designed and managed project <6 weeks long (33) • Across time zones - synchronously (32) • Same or similar time zone - synchronously (29) • Global collaboration students connecting <6 weeks long (27) • Across time zones - asynchronously (26) • Same or similar time zone - asynchronously (21) • Global collaboration students connecting >6 weeks long (20) • Designed and managed project >6 weeks long (16) • Student managed global collaboration <6 weeks long (11) • Student managed global collaboration >6 weeks long (8)	• Student managed global collaboration >6 weeks long (50) • Student managed global collaboration <6 weeks long (47) • Designed and managed project >6 weeks long (38) • Global collaboration students connecting >6 weeks long (36) • Global collaboration students connecting <6 weeks long (25) • Across time zones - synchronously (20) • Designed and managed project <6 weeks long (19) • Same or similar time zone - asynchronously (17) • Across time zones - asynchronously (17) • Same or similar time zone - synchronously (17)

Note. This table does not reflect the 2 responses for 'Not sure what this means'

Synchronous collaborations in same, similar and across time zones (91 combined responses for Category 1 and Category 2) are the next frequent types. The questions about 'designed and managed' projects had interesting responses in that a project running for less than six weeks received the most responses in Category 2 (33) and Category 3 (19), than for responses to 'greater than 6 weeks' Category 2 (16) and Category 3 (38). The least frequent type of online collaboration, as shown in Category 3, is student managed for both greater than six weeks (50) and less than six weeks (47). The middle response 'occasionally' is added to this table in an

attempt to show most categories (6 out of 10, see Figures 4.10 and 4.11 above) 'occasionally' responses are higher than others, perhaps indicating 'safety' in choosing the 'middle ground' in the scale without committing to either 'frequently' or 'rarely'.

4.2.2 Phase 1 Survey - Part C.

Part C of the online survey was optional and participants who elected to complete it did so in order to register interest in being eligible for Phase 2: Semi-structured interviews. The goal of Part C was to gather pertinent information regarding practice in and interpretation of online global collaboration. Of the 65 participants in Parts A and B of the survey, only 52 continued to respond to questions in Part C. A link to the Taxonomy of Global Connection was provided and participants asked to interpret the five levels of global connection in relation to their own practice in order to respond to questions 26-29. These four questions referred specifically to Levels 2, 3, 4 and 5 of the taxonomy, which was used as a lens for educators to examine their own practice in terms of how broad the classroom collaboration might be. Although this section of the Part C survey had parallels to Part B, question 23 (the frequency of implementation and type of online global collaboration), in this instance the questions were more focused on the taxonomy and pertinent to the specific goal of finding experienced online global educators for Phase 2: Semi-structured interviews.

Questions 26-29 asked 'how many times' the educator had joined or initiated a global project for each of the levels 2, 3, 4 and 5. A 6-point Likert scale was used, from 'never' to 'very frequently'. There was also an option to select 'I am still not sure what this means'. Figure 4.12 shows data from the 52 respondents. What initially stands out in the graph is that 29 (56%) responded 'never' to implementing 'Level 5: Student to student with student management'.

	Level 2: Interconnection (geographically close in proximity)	Level 3: Managed online global connection'	Level 4: Student to student with teacher management'	Level 5: Student to student with student management
Very frequently	3	0	0	0
Frequently	12	19	7	3
Occassionally	15	21	20	6
Rarely	6	6	10	8
Very rarely	7	0	4	4
Never	7	4	9	29
Not sure what this means	2	2	2	2
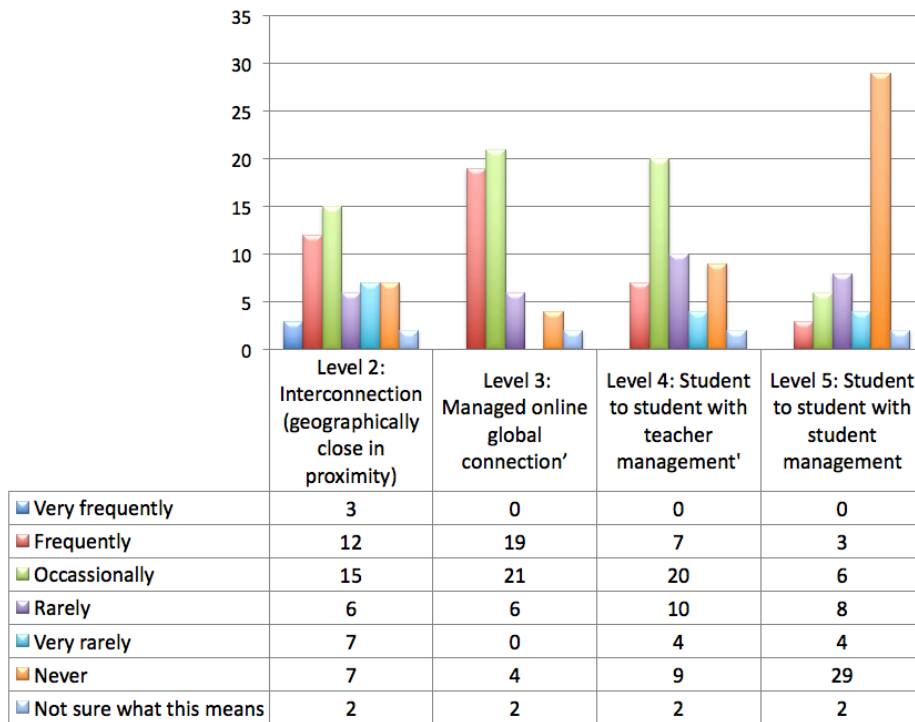
Figure 4.12. Phase 1: Q.26-29 Engagement with the Taxonomy of Global (n=52)

In summary, with regards to the Taxonomy of Global Connection, educators indicated they had been implementing level 2 (interconnection) and level 3 (managed global connection) more frequently than level 4 (student-to-student with teacher management) and level 5 (student-to-student with student management). Level 2 'interconnection' applies to implementing online global collaboration beyond the classroom but within a close geographical proximity, thereby allowing for synchronous connections and possibly for better alignment of curriculum objectives if within the same country or global regions. Level 3 'managed online global connection' applies to designed projects that have a timeline and a visible 'product', and are considered more of a commitment in time and curriculum focus than level 2. Level 4, 'student-to-student with teacher management', had a relatively high 'occasionally' response while Level 5, 'student-to-student with student management', although having some positive responses in the survey, is the online global collaboration level least implemented and seemingly more difficult to integrate and apply.

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4.2.3 Summary of Phase 1 data introducing global educators.

The Phase 1: Online survey collected a range of data concerning who the participants were, what they thought and how they approached online global collaboration in the K-12 classroom. The presentation of this data in the section above has helped to introduce the survey participants and provide valuable information in support of criteria for Phase 2: Semi-structured interviews participant selection. This is discussed fully in the following section.

4.3 Phase 2: Semi-Structured Interviews Participant Selection

The challenge at this stage of the research was determining a smaller subset of educators who could be invited to participate in Phase 2: Semi-structured interviews. It was necessary to apply additional criteria to the 65, K-12 educators who shared data via Phase 1: Online survey. As shown by Figure 4.13, survey Part C contributions reduced the overall number of eligible participants for Phase 2 from 65 to 38. This meant that 38 educators, of the 52 who actually started to complete Part C, actually shared their personal details with the intention of being considered for an interview to support the research. With further data filtering, a total of 32 respondents were finally considered eligible for interviews, and of these a final eight participants were selected. How that selection process took place, the criteria used, and then how the eligible 32 became the final eight interviewees is shared in the next section.
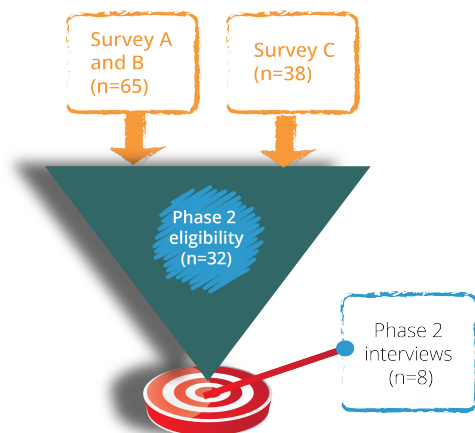
Figure 4.13. Selecting the final interviewees for Phase 2 interviews - an overview

4.3.1 Phase 2: Semi-structured interviews selection process - Part 1.

A colour-coded approach was applied to Phase 1 interview data on the Google spreadsheet of responses. The final 32 eligible educators for Phase 2 were found through a filtered approach whereby only K-12 educators who shared their personal contact details and those who were found to have insight and experience in global collaboration through narrative answers to earlier questions were deemed to be suitable for interviewing, as shown by Figure 4.14.
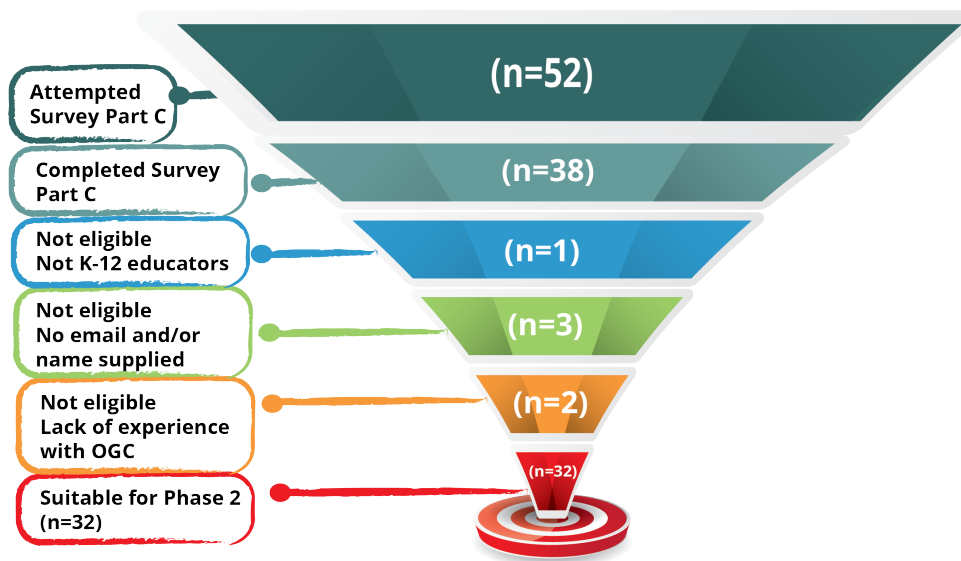
Figure 4.14. Colour coding used to inform Phase 2 selection

The more detailed process that took place to determine the 32 eligible educators for Phase 2 is shown in Figure 4.15. Of interest are the 52 respondents, out of 65 K-12 educators who completed Parts A and B, who started to complete Part C of the survey, questions 26-29, and shared involvement in online global collaboration based on their interpretation of the Taxonomy of Global Connection. These 52 educators may then have shared blog posts and online websites via invitation through question 30. When they reached question 31 which asked, *"Have you previously participated in or are currently participating in, or plan to participate in during the period of this research an online global collaboration of Level 2, 3, 4 or 5 that has or will run for a minimum of 6-weeks?"* Of the 52 educators, 14 could not confirm this condition and therefore did not continue. Nor did they share their contact details, completion of which was an essential criterion for Phase 2 eligibility.

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Of the 52 educators who started Part C, 38 participants answered 'yes' to question 31 and then were invited to continue with the survey to share their contact and further details about school and teaching situation. Further analysis of responses built a picture of experience for each educator. This perception, through shared online sites and shared experiences with online global collaboration, helped filter the eligible participants to be considered for Phase 2 from 38 down to 32.

Participants=69

Online survey
Part A and B responses

Criterion

Must be K-12 educators

Result
n=65

Participants=65

Online survey
Part C responses n=52

Additional Criteria

+ Name and email shared

+ Taxonomy level 2, 3, 4 or 5 for 6 weeks

Result
n=38

Participants=38

Phase 2 eligibility

Online survey
Part C responses

Additional Criteria

+ Evidence of online, global collaboration experience

Result
n=32

Figure 4.15. Phase 2 eligibility process Part 1: Data analysis, filtering and reduction

4.3.2 Phase 2: Semi-structured interviews selection process - Part 2.

Following on from Part 1, Part 2 of the Phase 2 selection process involved further analysis of data from the potential 32 eligible educators. This is shown in Figure 4.16 and included:

- Review of 32 responses to question 39, which asked, *"Describe briefly the online global collaboration of Level 2, 3, 4 or 5 that you participated in or plan to participate in that has or will run for a minimum of 6-weeks. Provide URLs to online information if available".* This question acted as a check on the response given to question 31 in that educators not only could state they had or were going to be involved in a 6-week minimum online global collaborative experience (Q.31), they then had to describe and, where possible, provide URLs to support this claim (Q.39). In addition, this shared collaboration needed to be authentic (one that could be explored online).

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Some responses stated they were 'about to make up a collaboration' and therefore were not included in the next stage.

- Further analysis of all of Parts A and B survey data including country, age, and scrutiny of answers to qualitative questions where participant narratives shared involvement in online learning, global connections and collaboration.

- Evidence of online activity such as through a Twitter handle, blog, and/or other websites - it was important that educators, selected for interview, had an online presence and were sharing something about their global collaborative practice, including artefacts of outcomes and reflective material based on experience. This evidence was largely shared by the educators through the survey, although further online activity may have been discovered beyond the responses.

From a potential 32 eligible educators, the process as outlined resulted in a final short list of 10 preferred interviewees and invitations went out to each of these. One did not respond at all, and one could not fit the interview into their travel schedule during the timeframe. Therefore, eight participants became the final Phase 2 case study interviewees.

Participant eligibility for Phase 2 = 32

Analysis of 32 survey respondents for:

- descriptive of online, global collaborative project for 6 weeks or more
- geographic, institution and education position diversity
- valid responses across all survey questions
- online activity revealing global collaboration (blog, Tweets, website)
- availability to be interviewed within timeframe

Participants for Phase 2 interviews = 8

Figure 4.16. Phase 2 eligibility process Part 2

4.4 Phase 2 participant profiles

After the exhaustive Phase 1: Online survey and Phase 2: Semi-structured interviews selection process eight eligible educators were finally invited to be included in the Phase 2 interviews. These educators willingly agreed to share their experience, practice, beliefs and engagement to do with online global collaboration. The Phase 2 educators' initial details are presented in the following section.

At the time of data collection, the eight educators interviewed were located in Australia, Thailand, USA, Canada, Ecuador and New Zealand. Collectively they were from independent, state and international schools, across K-12 levels. All educators are women, and although the online survey did not ask for gender, of the 38 educators who shared their name and details, it is interesting that 32 of these had female gender-specific first names.

As a way of introduction to the material in Chapter 5, summary data for the final set of educators who agreed to be interviewed is shown in Table 4.2 (pseudonyms are used). Compared to the full list of surveyed participants (n=65) the demographics are not significantly different: 89% (c.f. 75%) are age 40 or older, and 78% (c.f. 65%) have taught for 16 or more years, indicating representation from an older and more experienced group. Pertinent here is the evidence of participation in online global collaborative projects according to Taxonomy levels 2, 3, 4, or 5 - an essential criterion for being selected for an interview. In addition, at the time of the interview two educators were teaching outside of their home country of the USA, while a third had taught internationally for a short period a few years earlier; and only two lived and taught in a rural area (country Victoria, Australia; and rural Manitoba, Canada). It is likely that some of the project URLs listed in the right hand column may not be valid or accessible now, given the dynamic nature of the internet.

Table 4.2

Profile of Interviewees for Phase 2: Semi-Structured Interviews (n=8)

Pseudonym	Age	School Type	Location	Grade levels / Subject area / Specialisation	Length of time teaching	Evidence of participating in or planning to participate in a global project of Level 2, 3, 4, 5 as per the Taxonomy for Global Connection
Stella	60+	Government	Rural, Australia	K-12 influence, mostly taught 7-12 ICT specialist	30+ years	China Connects http://www.connectchinacollaborative.com/
Janice	40-49	International	Thailand (USA)	Primary levels Currently Gr 3	16-20 years	The Global Read Aloud http://theglobalreadaloud.com/
Donna	40-49	Government	Urban, USA	High school - social studies & English	16-20 years	Flat Connections Global Project http://flatconnectionsglobalproject.net
Jill	60+	Government	Urban, Australia	Primary levels, ICT specialist	30+ years	Persuasive Writing No URL
Susan	50-59	International	Ecuador (USA)	5th grade	26-30 years	Global Read Aloud - http://www.globalreadaloud.com/
Meredith	20-29	Government	Canada	Grade 1 teacher	6-10 years	Kids Who Code project Flat Matt project - http://adventuresofmatthewandjim.blogspot.ie/ Global Read Aloud - http://www.globalreadaloud.com/
Angela	50-59	Independent	New Zealand	Technology facilitator K-8 ICT specialist	30+ years	Flat Connections 'A Week in the Life' http://aweekinthelife17-1.wikispaces.com/
Claire	40-49	Independent	USA	Librarian Library Tech specialist	6-10 years	http://www.flatconnections.com/ http://ourglobalfriendships.wikispaces.com/

Note. Location in brackets refers to home country

4.5 Summary

Chapter 4 introduced the K-12 educators who implemented online global collaborative learning. These were found through a process of distributing an online survey leading to collation and analysis of data from 65 educator responses. This data in itself was useful and pertinent as a microcosm of the state of online global

collaborative learning by educators in K-12 schools across systems within 17 countries. Graphs and descriptive material have been shared as part of the initial presentation of data in this chapter. Additional analytical comments to interpret statistical and qualitative data have begun to reveal why this particular information is important as part of this section of the thesis and for outcomes as a whole. This chapter also detailed the search for online global collaborative educators through further analysis of the survey data, with reference to established criteria for selection. As a result, eight educators accepting an invitation to be interviewed.

The final eight global educators for Phase 2: semi-structured interviews are presented briefly including tabulated data sharing profiles. This prepares the reader for Chapter 5 where interview data analysis and interpretations are presented in a broader narrative.

CHAPTER 5 – PRESENTING THE ONLINE GLOBAL COLLABORATORS

5.1 Introduction

This chapter focuses on the presentation of the interview narrative data from Phase 2: Semi-structured interviews of the research design, along with pertinent Phase 1: Online survey data for the eight educators interviewed. An important part of this research was realising and understanding the individuality of these interviewees. Each is a separate unit of investigation about the phenomenon of online global collaboration in K-12 classrooms, as per the case study design detailed in Chapter 3. In Chapter 4 the eight interviewed online global collaborative educators were introduced through brief profiles. In this chapter data from each interview is interpreted and presented revealing the uniqueness of each participant, and some similarities.

5.2 Meet the Online Global Collaborative Educators

Interviewees were chosen based on past, current and potential involvement in online global collaboration in the classroom. One key criterion was that they had already or were about to implement an online global project for a minimum of six consecutive weeks' duration at Taxonomy of Global Connection (see Appendix 2) level 2, 3, 4 or 5. This indicated a commitment to an ongoing collaboration, a realisation that collaboration takes time to develop, and potential readiness to discuss online global collaboration at a deeper, more experienced level.

Each interview was based around the three research sub-questions, with additional related questions to guide the conversational manner in which the interviews were conducted. As a researcher my goal was to ensure interviewee experiences were highlighted and accurately interpreted in this presentation chapter. This included: details regarding school logistics and evidence of online collaborative learning and professional learning (RQ1); beliefs around the use of teaching and learning, educational technologies, online learning and online global collaboration (RQ2); and pedagogical approaches and strategies when implementing online global

collaboration (RQ3). As the pinnacle of deeper thought and consideration and as part of the bigger picture, each interviewee was asked to reflect on school culture and share further thoughts on global collaboration as a pedagogical approach or a curriculum.

The open-ended questioning and semi-structured nature of the interviews meant that not all participants were asked the same set of questions and not all questions were asked in the same order. Therefore, question format, process and order was flexible depending on the interviewee responses, interest and tangential conversation at the time of the interview. The interview process was fluid and I was able to navigate the general flow of the discussion and divert conversation back to essential questions within the flow of the interaction, or when a natural pause in information sharing happened. Some of the participants wanted to embark on a more negative set of responses, sharing frustrations and inabilities to do online global collaboration, as they thought it could be done within a school, while others were positive and upbeat throughout, despite barriers to implementation that emerged during the discussion.

5.2.1 Educator roles.

The method chosen to delineate or segment the group and this chapter as a whole is based on the participant's educational role within their respective schools, , as shown in Figure 5.1. Those who are 'Classroom teachers' are presented first with green as the profile colour; those sharing both 'Classroom & Specialist' roles are purple and presented second; and, 'Specialists' are blue and presented last in this chapter. This role distinction is important to understand how participants leveraged their school status in order to implement online global collaboration. Theoretically classroom teachers are autonomous within their realm, although answerable to curriculum objectives and school expectations. The specialists (Library and ICT) are typically in a school to support classroom teachers and usually do not have their own 'class' (set of students) to work with autonomously, or if they do, they have them for a more limited timeframe, such as one library lesson per week, or two ICT lessons per week.

Figure 5.1. Educator role of the participants within their school

5.2.2 Educator profiles through metaphors and conceptual diagrams.

In the data presentation each participant is initially introduced through conceptual diagrams and profiling where key terms and phrases provide insight into personality and professional experiences. In an attempt to build empathy with the participant, I created a purposefully assigned metaphor, highlighting the individual's essential motivation and 'state of being', for example 'Janice: Outlier butterfly'. Each metaphor, with description, indicates participant disposition, as summarised in Table 5.1. Participants'' further qualities are listed under the headings of 'Learner', 'Professional capacity', 'Leadership' and 'Digital competency'. In addition, a profile summary created as a conceptual diagram and visual metaphor in the shape of a globe and world map is shared in conjunction with a circular set of key descriptors for each participant. The design represents the profile in a memorable and insightful way and creates associations with the metaphor to convey additional meaning about the content (Eppler, 2006).

Following the metaphor, key qualities and profile summary, data collected from Phase 1 interviewees' personal interpretation of each of the five levels of online global collaboration in the Taxonomy of Global Connection, related to how this was being implemented in their classroom or school, is shared through an individual radar chart. Hence, the Likert-type scale on the radar chart for level of implementation ranges from 'never' to 'very frequently'. Acknowledgement of

participation in a global project of levels 2, 3, 4 or 5, according to the Taxonomy, and descriptive material around a personal favourite online global collaborative project is followed by the main interview as a narrative that reveals the 'voice' of the interviewee.

Table 5.1

Educator Personal Metaphor, Description and Disposition

Name	Metaphor	Description	Disposition
#1 - Janice	'Outlier Butterfly'	Emerging as a global collaboration advocate ready to implement and defend new ideas and practices	Global collaboration is 'non-negotiable' and should be included in the curriculum; collaboration online with other teachers increases your learning rate
#2 - Donna	'Believer'	Regular global collaborative activity has built confidence and belief in the value of new pedagogical approaches	Global collaboration should become part of everyday teaching and learning
#3 - Susan	'Reluctant Outlier'	Actively plans and participates online and joins with other classrooms globally for collaboration despite school resistance	Would prefer to work within the school system but will work outside as needed to meet learning goals for students; connected and collaborative learning is pedagogy everyone should adopt; always positive about better learning outcomes
#4 - Meredith	'Catalyst for Change'	Classroom practices provide a microcosm of what learning looks like while connected online and collaborating with the world	Barriers can be overcome, online global collaboration is engaging and builds excitement for learning and it's the way we learn; global collaboration is not an add-on
#5 - Stella	'Intrepid Communicator'	Enhanced online communication skills has affords an extensive global network to be leveraged for classroom connection and collaboration	Will connect and collaborate with all who are willing in order to enhance global learning; global connection is imperative to learning today
#6 - Jill	'Visionary Stalwart'	Designs and implements global projects and connects with others online to support new learning modes	Relentless and passionate about the need for change within schools to include global collaborative opportunities; discouraged when others do not share the same vision
#7 - Angela	'Connector'	Works hard at connecting educators and students online within and beyond the school to make the 'shift' happen	You can learn something from everyone, especially students. Flatten the learning environment to maximize potential; collaboration changes the teaching paradigm
#8 - Claire	'Mentor'	Works confidently with educators to share knowledge and build skills; advises administrators and colleagues about online global learning	Believes in the power of successful global collaboration and that everyone can learn how to do at

5.2.3 Presenting the interview narratives.

Moving beyond the initial profile and online survey responses, each participant interview section is presented in three main sections:

- Experiences with online global collaboration: In response to research sub-question one, participants were asked about their experiences implementing online global collaboration within their school learning environment.
- Approaches and beliefs to do with online global collaboration: In response to research sub-question two, participants were questioned on their beliefs about learning and teaching and the influence these may have had on engagement in online global collaboration.
- Pedagogy, curriculum and school culture: This section broadly relates to all research sub-questions in terms of experiences within the school, beliefs and pedagogical approaches.

5.3 Global Collaborative Educators Who Are Classroom Teachers

This first group of four participants, 'classroom teachers', were full time in the classroom at the time of the interview. One, Meredith, is an early year's teacher; two, Susan and Janice, teach at primary school level; and, one, Donna, is teaching at the high school level.

5.3.1 Global Collaborator #1: Janice - 'Outlier Butterfly'.

Charismatic international educator Janice enthused about the need for online global collaboration to be non-negotiable in the curriculum. She shared personal willingness juxtaposed with school-imposed barriers and provided insight into how teachers have to adapt to grow and innovate.

5.3.1.1 Profile of Janice.

Janice has diverse teaching experience across K-7 levels in the USA, China, Africa and Thailand. This included leadership positions such as the 'Head of Professional Development Committee' or 'House Leader', and a member of the 'Assessment Policy Review Committee'. At the time of this research her position was in an International Baccalaureate (IB) school teaching Grade 3 in the Primary Years Programme (PYP). She was also a PYP workshop leader and travelled to other countries each year to run professional learning to support other IB educators. Extremely comfortable with online technologies she team-teaches with her Grade 3 colleague, taking the lead in IT-related learning. Figure 5.2 shares the profile summary of Janice as the 'Outlier butterfly'.

Metaphor: 'Outlier Butterfly'

- **Description**: Emerging as a global collaboration advocate ready to implement and defend new ideas and practices
- **Disposition**: Global collaboration is 'non-negotiable' and should be included in the curriculum; collaboration online with other teachers increases your learning rate

Key qualities

- **Learner:** Readily adopts new methods; excited about new possibilities
- **Professional capacity:** Emerging global network; high energy to sustain connections
- **Leadership:** Curriculum workshop leader; influential amongst peers and wider network
- **Digital competency:** Positive approach to technology; explores new tools for online global learning

Adaptive mindset towards technology

International educator

Global collaboration is non negotiable

Curriculum expert & share with others

Allows students to make mistakes

Janice "Outlier Butterfly"

Frustrated by school barriers

Building stronger connections

Constructivist approach

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Janice	40-49	International	Thailand	Grade 3	16-20 years
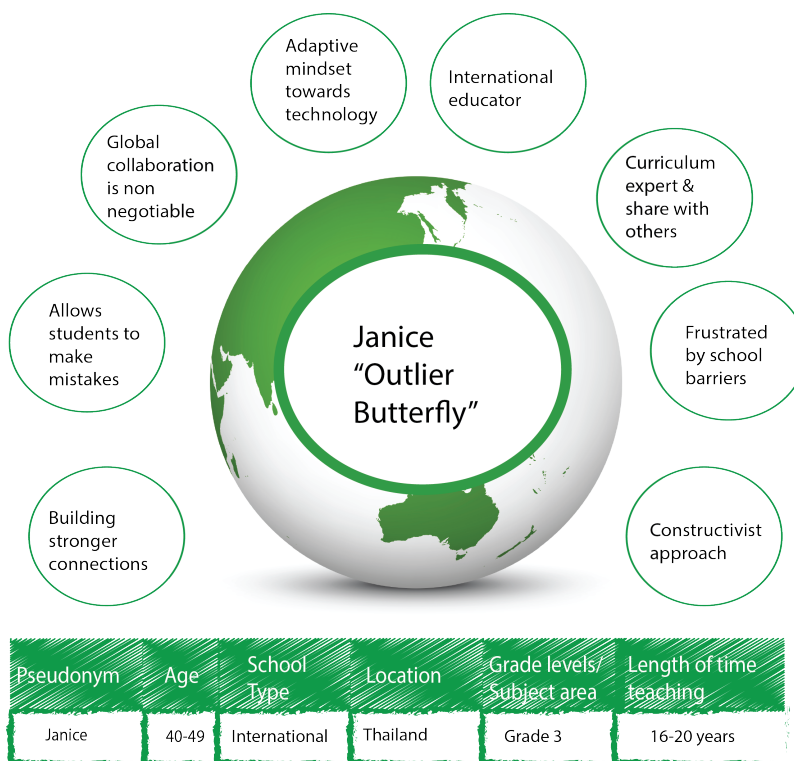
Figure 5.2. Profile summary of Janice: 'Outlier butterfly'

5.3.1.2 Phase 1: Survey responses – Janice.

This section documents some of the initial data Janice shared via the Phase 1: Online survey. Using the Taxonomy of Global Connection as a lens Janice revealed she is relatively new to online global collaboration. Figure 5.3 shows Taxonomy

levels 2-4 rated as 'Occasionally', while Level 5, where student autonomy and management is expected, rated as 'Never'. This could be a reflection either of the grade level being taught (Grade 3) or Janice's inexperience with different collaborative modes. The online global collaboration of Level 2, 3, 4 or 5 that she participated in for six weeks previously was called 'The Global Read Aloud' (http://theglobalreadaloud.com/). In addition, Janice provided this description for her favourite online global collaboration:

> International Dot Day was one of the first global projects that I participated in. For this project, we read the book 'The Dot', by Peter H. Reynolds. I love the book's message of creativity and individuality and the power of a teacher. You can find out more about this project on the website - http://www.thedotclub.org/dotday/.
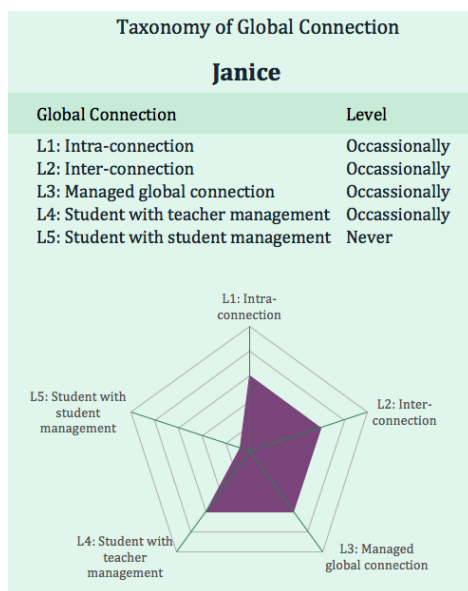
Figure 5.3. Janice's collaboration aligned with the Taxonomy of Global Connection

5.3.1.3 Phase 2: The interview – Janice.

Janice's interview revealed a bubbly enthusiasm and strong passion for teaching and learning. She considered herself an outlier within the school system and when "fighting the fight" for change focused on what will positively affect the most students and staff. Her wonderment at how she had not embraced "doing online global collaboration" earlier in her career and subsequent determination to embed it from now on was tempered by stories of inhibitors and self-declared realisation that she was not totally in control of how and what she did as an educator. She stated up

front that her understanding of online global collaboration is that "we just don't do it enough" and it is not prioritised within schools.

At the time of the interview Janice worked as one of the teachers in a Grade 3 level team comprising two teachers and 32 students. Having more expertise than her colleagues, she initiated online learning ensuring all Grade 3 students had the same experience throughout the year. Collectively they had access to six laptops and six iPads and recently moved from Moodle to Google apps and docs. As a teacher she had no autonomy in making decisions about technology because approvals came from the IT Director, and more importantly, the Head of School made the final decision. Janice noted students did not engage in any external social platform, although they had their own Gmail accounts and access to the Google suite of services. This includes Google chats (students chat online with their teachers), and Google docs and Google slides.

5.3.1.3.1 Experiences with online global collaboration.

Janice actively experimented with different global connections although she admitted personal disappoint related to not following through on ideas for global collaboration. For example, when she attended a project celebration with a school in Nepal and had an idea to connect around the earthquake disaster, but now that idea was gone due to lack of follow through, "I have a lot of these ideas, but getting them executed if you're not actively doing it, and the other things aren't pulling you, it's really hard to make it happen".

Janice viewed online global collaboration as essential and yet is challenged by school-imposed barriers that make her time poor. Skype and synchronous communication are a basic approach to true global connections beyond the classroom, and yet, in her words, "Global collaboration can be so much more". Janice considered that planning to collaborate and go beyond the Skype call did not happen without curriculum design. In her class, students already used Skype and Google Hangouts to collaborate and share learning through answering questions with external others. Right now her students take action by teaching other students online. She acknowledged:

Now what it looks like in my class is that we work with other kids basically to collaborate on learning to share learning to answer questions. We have not had a project that was student created yet but that would be really cool. But it does really help for kids to take action by teaching other students. My students this year taught kids in Pattaya (Thailand) about the body.

Janice's students were second language English (English as a Second Language (ESL)) and her approach in the classroom needed to accommodate this, however as she identified:

The thing that first comes to mind is that a lot of my students are ESL students and we were really good at teaching reading and writing and math and science and social studies, but one of the things that gets left off is listening and speaking and doing online global collaboration and projects where you need to speak. Even Skyping with another class, or Skyping with an expert where you need to speak.

Janice also declared students should be blogging and sharing with the world - if all Grade 3, 4, and 5 students were blogging it would be powerful learning. She was an advocate for using social media to connect educators for information exchange and to learn about new global opportunities through sharing beyond the classroom.

When asked if other teachers were doing any online global collaboration in her school, Janice replied, "Not at all . . .not that I know of . . .The grade 2's have Skyped with a student teacher that they had about their unit. Yes, so I could say that Skype is being used but I wouldn't necessarily say for global collaboration". Table 5.2 reveals current synchronous and asynchronous technologies and how Janice (for personal learning) and her students used them.

Table 5.2

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Janice

	Synchronous technologies	Asynchronous technologies
	Skype, Google Hangout, Fuze, Blackboard Collaborate	**Wiki, Blog, Google docs, Edmodo, Padlet**
Personal learning	• Skype for collaborating with teachers • Google hangouts for sharing and learning more about other practices (Youthvoices.net) • Fuze for Flat Connection Global Educator Course • Blackboard Collaborate for K-2 Building Bridges to Tomorrow, and webinars during Connected Educator Month	• Wiki for all the workshops I run as a presenter • Blog - personal and professional • Google Docs - essential teaching tool for collaboration and data analysis • Edmodo - personal account to connect with the Global Read-Aloud project • Padlet - used in and for workshops
	Skype, Google Hangout	**Blog, Google docs**
Student learning	• Skype for Mystery Skypes • Google Hangouts for connecting students with people in other regions of the world to learn about the effect of the nearby landforms on their daily life.	• Blog for the students, co-author blog posts when reflecting on their learning • Google Docs - students keep reading logs and reflections online

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.3. Janice was wary of assuming everyone thinks global collaboration is a great thing to do, so her engagement with others in the school, especially administration, is a key goal to foster support. One enabler for her was recent participation in the Flat Connections Global Educator online course. Another enabler was engagement with school administration around new understandings in order to encourage global collaborative objectives within the school. Hooking up with other projects and educators who had already established clear pathways for connecting online also enabled Janice's practice.

Although a willing participant, Janice had a slow start to global collaboration, largely due to external barriers beyond her control including technology blocked through the network; lack of permission to blog with students; and inability to use alternative tools other than those the school implemented or dictated. As Janice

explored and discovered global opportunities for her students, she found it quite difficult because she was constrained within the school, and acknowledged:

> I started wanting to collaborate with people and I wanted to join the 'Global Read Aloud' and it was not even approved that I could have my class join Edmodo. At the time we were using Moodle and we weren't allowed to use anything else. And another stumbling block I came across was that the first person I wanted to work with wanted to do Kidblog but I wasn't allowed to blog at all. I started a blog I think on blogger or something and I was asked to take it down.

Table 5.3

Enablers, Barriers and Outcomes of Online Global Collaboration: Janice

Enablers	Barriers	Learning Outcomes
• Professional learning through the Flat Connections Global Educator online course • Engaging administration early in conversations to gain support • Connecting with other educators already doing it and who may have pathways in place to collaborate • Joining existing projects that are well designed, have a central website and provide access to other like-minded educators • Collaborative planning & implementation of curriculum in Grade 3 classes • Technology is valued in the school - good access to wireless network and resources	• Lack of approval to join other online places different to what the school is using • Lack of approval to keep a class blog • Time poor and curriculum-stymied due to evaluation and accreditation process • Time poor due to increased administrative requirements • Sending tweets to a Principal for approval and posting • Lack of autonomy in use of technology in the classroom - need to get permission from IT Director and Principal / Head of School • Lack of research-based implementation • Heads of schools need to accept and request • Controlled learning environment and fear-based decision where 'mistakes' are not valued	• Enhanced student engagement that leads to amplified learning • Gain a global perspective and understand there is a bigger purpose • Listening and speaking, especially to support ESL students • Supports English language acquisition through different communication modes • Fosters an active participatory approach - engages all the senses and kids are just fully present with what they are doing.

Janice's school had good internet connection and wireless access however a major barrier was the need for permission from the Principal and the IT Director to use certain technologies - a process she found frustrating. The immediacy of using Twitter to share to a wider audience, for example, was impacted by having to send tweets to the Principal for central posting. She considered this extra step an unnecessary restraint put on teachers. After much discussion with her administration she established one blog for Grade 3 classes that was being viewed as a "newsletter replacement", although it did often post student work.

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An additional barrier imposed more recently was a school decision to have four report cards and parent conferences per year instead of the usual one, thereby creating extra time constraints on teacher planning. Janice also spoke vehemently about this, in her opinion the ISA (International School Assessment) evaluation and accreditation process was having an impact on alternative approaches to teaching and learning, such as global collaboration, through the need for teachers to focus on what was already being done rather than on possibilities. Janice also mentioned the lack of research-based implementation of online global collaboration as a barrier remarking, "I don't know if that will take hold until there is research and Heads of Schools can say 'Oh, this is a research-based method, I want my teachers doing this'". Fear-based decision-making by administrators "and those fears can be quite hard to argue against", said Janice, impacted new initiatives like global collaboration. She impressively described a possible brave new world where fears turn into knowledgeable and thoughtful online collaboration used to "fuel win-win situations" in order to support better student digital citizens.

Janice was very vocal about the positive outcomes of implementing online global collaboration. In addition to supporting ESL learning objectives she maintained:

> It enhances student engagement and when students are engaged the learning is amplified. The students feel that there is a MUCH bigger purpose but it isn't the kind of purpose where it has to be explained by a teacher where you say, 'Oh I want you guys to learn math because you're going to have to use it when you go shopping'. When kids are collaborating globally, when they are sharing things, sharing learning, when they are realising that kids of all different cultures and all different areas of the world are reading the same book, they understand the purpose of that immediately.

5.3.1.3.2 Approaches and beliefs to do with online global collaboration.

In Janice's opinion, the use of online technologies is a mindset, and she said, "It is not hard to learn - and learning is best done with a network of like-minded educators to support each other - encourage, collaborate". Janice willingly experimented with new digital technologies and personally used Edmodo, Skype and Flipboard amongst others.

In recent years a turning point for Janice was when she switched to teach a Grade 2 class and needed to know what others were doing at this level. She started reading blogs and participating in online communities, like the Connected Educator month, LinkedIn and ASCD online communities. This led to her creating her own blog, "I always blog in my head but it doesn't always end up on the computer screen". Blogging led her to start using Twitter, "Twitter is amazing and it's now much more dynamic. When I first started I just read and clicked on things now I share articles and join Twitter chats and like there's a twice monthly #PYPchat".

Janice attempts to read new books to keep up with educational technology and also attended webinars, and used EdWeb, an online social platform where people are sharing live webinars and recordings. She commented that her PLN has increased significantly since being active in these online places. Janice spoke about how teachers she connects with were doing online global collaboration in their class, not as a requirement but because they want to and they were excited about it:

> I feel like as a general rule of thumb people are like 'Yes, we could do this, we could do that'. And it's a lot of excitement and trying new things like when we were participating with the K-2 Building Bridges online global project, and where we were embedding stuff and another teacher said 'Oh yes, I'll give it a try'. So there's a very positive and motivated level and I feel like what happens if it's not positive and not quite collaborative then that relationship just kind of dies and the collaboration just kind of dies.

Regarding skills and attitudes needed by educators for online global collaboration, Janice was eloquent with her ideas and cited them as patience, open mindedness, flexible thinking and being able to troubleshoot, as well as confidence in one's own ability to learn new technologies. She identified:

> We need teachers teaching other teachers. We need better approaches to learning skills and more pedagogical conversations and opportunities to learn from others. I think one reason people don't do it [online global collaboration] is because they don't know about it. So I think it has to be prioritised in a document.

Janice's approach to teaching and learning has been impacted by being globally connected. Her ability to find resources and understand learning has improved through use of her online network and by reading teacher blogs, and exploring tools like Pinterest, 'Teachers pay teachers' - and more - it helps her keep up with new and

best practices. She claimed that, "Through this engagement and broader understanding and adoption of new ideas - your teaching will NOT stay the same. Collaboration online with other teachers increases your learning rate".

Janice embraces an inquiry-based constructivist approach to teaching and learning, and encourages students to come up with their own ideas and reach their own conclusions. In her view, online global collaboration gives this inquiry-based approach purpose and 'adds value' to the teaching and learning process. When students know their work is shared with others in different parts of the world it adds a level of thoughtfulness and engagement she had not seen otherwise. Online global collaboration helps students construct their own knowledge, as Janice stated, "I feel online collaboration helps me do that because it amplifies motivation and amplifies the purpose and then I feel like it increases the academic rigour". Janice runs workshops for other IB teachers and shared with me her shock at how many educators are unconnected, including no Twitter, and no understanding of wiki use.

5.3.1.3.3 Pedagogy, curriculum and school culture.

Janice sees herself as an 'outlier' in her school, has fought battles defending global collaboration and lets decision makers know when she does not agree - but keeps these conflicts to a minimum to advantage most students and teachers. She wants to lead global collaboration but is frustrated by teacher attitudes and systemic constraints. She thoughtfully shared that in her opinion global collaboration is more than pedagogy but would not necessarily call it a curriculum. "I think global collaboration for me is a necessity for us to teach children the skills they need for the 21st century, like in my opinion it should be a non-negotiable". She understood how children were developing a digital footprint and need to be taught the thinking and social skills that go along with this online activity.

Janice was adamant that school culture had to change. She advocated for removing barriers within the school so they could "blaze ahead". The current 'control' methods within her school restricted the sort of learning activities she wanted to implement, such as publishing student work online. She believed the school culture must value international interactions and collaborations, and this has

to be shown from the top with the IT Department responsible for providing adequate infrastructure and access to technology. Placing value on global collaboration as an approach to research may provide better support and value within the school given that, in Janice's situation, school administrators have the main responsibility and power to affect change.

5.3.2 Global Collaborator #2: Donna – 'Believer'.

Clarity of purpose comes to mind as I reflect on the interview with Donna. She is a dynamic educator who determinedly pushes boundaries with astute awareness of the implications of online global collaboration for teaching and learning.

5.3.2.1 Profile of Donna.

Metaphor: 'Believer'

- **Description:** Regular global collaborative activity has built personal confidence with and belief in the value of new pedagogical approaches
- **Disposition:** Global collaboration should become part of everyday teaching and learning

Key qualities

- **Learner:** Willing to persevere; tries new approaches to learning; flexibility in the classroom is paramount to learning
- **Professional capacity:** Thrives in an environment where leadership understands and supports global collaboration; global network provides collegial collaborations
- **Leadership:** Pushes boundaries in the classroom and within the school; finds solutions for challenges to collaboration
- **Digital competency:** Uses a range of online tools personally and with students; advocates for personal, mobile technologies

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As a social science teacher with a focus on World History and English, at the time of the interview Donna taught 14-18-year-old students in the USA in an environment where technology allows for mobile learning while connected to a robust network. Over the past few years, in positions across three different US state education systems she took on additional roles to teaching such as Model United Nations coordination, leadership committee membership for policy making and curriculum development.

Donna was adamant the 'revolution' in online learning has changed her teaching. Although compliant with district needs and expectations, at the same time discussions with administrators gained their support for alternative approaches to scheduling, curriculum and online learning. She recently worked hard to transfer these approaches to a new state, district and school with similar success. About online global collaborative learning she stated, "The dynamics of teaching and learning don't quite feel complete or necessarily appropriate unless students are allowed to have those experiences".

Donna revealed increasing confidence and capability with online global collaboration and eloquently shared the impact on her teaching - the metaphor of 'believer' fits her passionate approach, as shown by Figure 5.4.

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Donna	40-49	Government	Urban, USA	High school Social Studies, English	16-20 years

Figure 5.4. Profile summary of Donna: 'Believer'

5.3.2.2 Phase 1: Survey responses – Donna.

This section documents some of the initial data Donna shared via the Phase 1: Online survey. Using the lens of the Taxonomy of Global Connection, Donna's involvement in online global collaboration is revealed. All five levels are represented as part of classroom implementation, with levels 2-4 implemented 'Frequently'

(Figure 5.5). Donna provided this description of her favourite online global project of Taxonomy Level 2, 3, 4, or 5:

> My favourite online global collaboration experience is the Flat Connections Global Project (http://flatconnections.com). The student experience with communication, collaboration, and creation is most authentic in this project. Students from around the globe have an opportunity to work together using a variety of tools both synchronously and asynchronously.

Taxonomy of Global Connection

Donna

Global Connection	Level
L1: Intra-connection	Frequently
L2: Inter-connection	Frequently
L3: Managed global connection	Frequently
L4: Student with teacher management	Frequently
L5: Student with student management	Occassionally
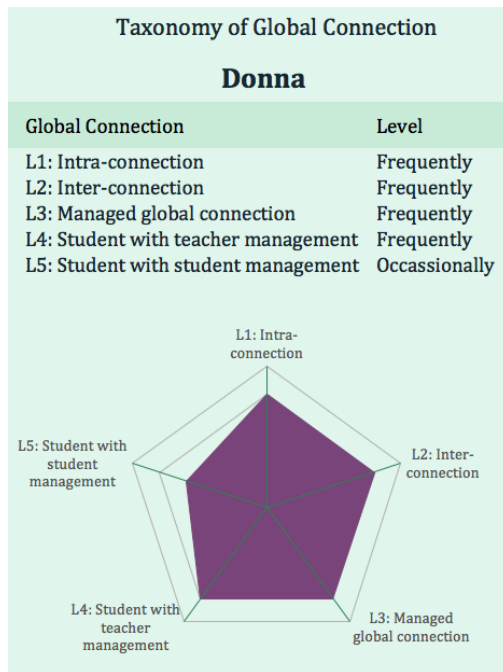
Figure 5.5. Donna's collaboration aligned with the Taxonomy of Global Connection

5.3.2.3 Phase 2: The interview – Donna.

Donna approached the interview with great self-assurance. She was eloquent about her experiences and understandings and passionate about student learning while continuing to explore global opportunities.

5.3.2.3.1 Experiences with online global collaboration.

In relation to research sub-question one and school experiences, Donna had a pragmatic understanding of what collaboration means in the classroom, "groups of people working together", and in doing this her students work in both local and global teams. Both synchronous and asynchronous digital tools enabled this workflow: face-to-face and virtually. She talked about the difference between 'communication' and 'collaboration' and had implemented a variety of online collaborations through connections with other educators. Through these

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collaborations students met online, "communicated", and shared perspectives and cultural understandings. In her previous school the opportunity to work with a Computer Studies teaching colleague to build an interdisciplinary curriculum branched out into a global collaborative opportunity. Table 5.4 presents synchronous and asynchronous technologies and how Donna and her students used them.

Table 5.4

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Donna

	Synchronous technologies	Asynchronous technologies
Personal learning	**Skype, Google Hangout, Fuze, Blackboard Collaborate** • Skype, Google Hangout as well as Fuze and Blackboard Collaborate • As well as scheduled meetings, such tools continue to be used for webinars and classes for own personal learning.	**Blog, Twitter, Facebook** • Blogs – Personal for reflection and sharing learning and reads other professional blogs • Twitter and Facebook to connect with other educators regarding global collaboration or individual content areas for teaching such as #flatconnections, #globaled
Student learning	Skype, Fuze, Blackboard Collaborate • Student online global collaborative meetings in Fuze and Blackboard Collaborate • Students presenters at the GEC using Blackboard • Skype, to be present in the classroom when not physically present in the school.	Blog, Google docs, Twitter • Google docs and other Google tools daily to work collaboratively on projects, research and peer editing. • Classroom blog so that students can share, question, and reflect on their learning • Students conduct slow tweet chats.

According to Donna true online global collaboration happens when students work together on shared outcomes, as she stated, "You have students from around the world, they are working together in teams on something in common, they are creating together, they are sharing ideas, they are contributing to research, for me that's collaboration". In Donna's school the use of online technologies for global collaboration was still an unusual practice, and therefore students are not comfortable because they are not used to it. As she stated:

> They're really used to interacting with their peer group, with people they know. When you ask them to do it in a professional or academic setting with people they've never met face to face before, all of a sudden that's just a new concept for them.

The school has acted in support of global collaboration through recent surveys of parents with questions like "within the next 25 years what should education look like?". and "what should the district be doing, what do you want our students to know, what kind of skills do you want them to have?". Global was one of the top ten terms that emerged, so Donna admitted this clearly is a concern for the community; parents wanted that as part of their student's education.

Donna strategically provides full disclosure to administration and parents when students are online and connecting globally. This includes keeping parents informed through letter communication and permission slips as needed. Donna acknowledged:

> I would never want a parent either or a student to approach a curriculum director or superintendent and say 'Hey I've been doing this in my classes or in my school' and then a superintendent to be caught off-guard or not realise what's going on, particularly with students being online and interacting with others I want them to be in the loop. Number 1, I want them to be aware, I just think that's generally respectful, but you know I've found that most administrators want to showcase that work as well.

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.5. At Donna's school administrators enable online global collaboration. They do this by: embracing new "out of the box" ideas including global collaboration; encourage and support teachers to try new things; allowing them to take risks, with the understanding that failure (if it happens) is acceptable. Donna felt supported to try a variety of new things and build success in the classroom. The District Technology Director was also supportive, and willing to open blocked websites as needed. Ideas for new technologies are considered within the financial parameters of the school. At the same time however Donna lamented the lack of uptake within the school - other educators not following her lead and school administration not looking at how to extend the practice within the school.

Digital citizenship skills also enabled online global collaborative learning in the classroom. Donna revealed how she fostered these in the classroom,

> You know we have conversations about how that might be interpreted, what others are going to think . . .a lot of conversations around digital citizenship,

digital footprints, the fact that an online presence is very important, not only for building your own reputation . . .and then how the things you're going to say are going to have an impact on others.

Table 5.5

Enablers, Barriers and Outcomes of Online Global Collaboration: Donna

Enablers	Barriers	Outcomes
• School administration encourage 'out of the box' thinking • Internal support for taking risks and considering 'failure' is okay too • Empathy building activities with students to build trust and confidence • Wider District support through unblocking websites • Preparing for collaboration online through digital citizenship skills	• Student mindset - not understanding the use of social media and online sharing to support learning • Reluctance to share ideas or publish online and work with others • Learners lack of trust, or ability to build trust of others that leads to collaboration • Bandwidth access • Inconsistent and unreliable technology • Teacher mindset - seeing global collaboration as 'one more thing' to do • Inconsistent involvement from all stakeholders	• Student realisation that technology tools can be used for more than 'social casual interactions', do serve a purpose and can lead to productivity • Teacher confidence improved in working in online learning environment • New strategies for dealing with online learning - how to overcome problems • Deeper and broader connection with the outside world for students - realisation they can connect and communicate with others (experts, peers) for learning • Real world experience dealing with inconsistent communication and involvement in team/collaborative work

Technology that is inconsistent and sometimes unreliable because it stops workflow and inhibits innovation was often a barrier. Another interesting barrier was the mindset of students where social media and professional learning are kept distinct from each other. Donna felt students reluctantly blog, share and collaborate online as they have not built trust with their co-collaborators. Work is naturally shared with the classroom teacher whom they are conditioned to trust, but sharing online has not been established. Donna helps students realise similarities and commonalities with others through online interaction. This helps build confidence, trust and readiness to share personal ideas online. In her view overcoming these barriers is essential before real collaboration can take place. She shared:

Sometimes the mindset of students can not necessarily be a permanent barrier but something that you have to overcome . . .so much of their technology is used for social media and social parts of their life that when they are on a blog per se, Twitter or something like that and you are asking them to do something in a professional, academic setting sometimes they

tend to be resistant to that, and so it's working with them and through that that sometimes can be a challenge.

Inconsistent participation and/or communication were one of the biggest challenges of collaboration, and Donna regarded this as being the same challenge whether the situation is face-to-face or online and at a distance. How students and teachers manage this is an authentic real-world challenge. Donna talked about this happening in the workplace and in teaching and on committees and believes:

> The understanding that you are not necessarily going to control the behaviours of others, but that you really can control your own, so what are you going to do, how do you handle that when that happens? I think those are some of the best learning experiences that students have and those are frustrations that adults outside of schools often feel in the workplace, it is not uncommon.

In Donna's opinion, students come to learn that technology tools can be used purposefully and lead to different types of productivity beyond social interactions. This outcome includes the realisation that students can seek out and communicate online with a professional or an expert thereby opening new horizons and possibilities not thought of before. Online global collaboration has personally allowed Donna, as an educator, to network and collaborate with other educators across the world, "It's this entire never-ending amazing network and I think the teachers who become aware of and start diving into that has been [sic] an amazing outcome". She was adamant it is important for local communities (school districts in the USA) to see what the possibilities are, that others are out there doing it, and encourage further participation.

5.3.2.3.2 Approaches and beliefs to do with online global collaboration.

Donna shared her beliefs about learning and teaching, aligned with research sub-question two, and discussed how to her it is important to take risks. She understands that learning happens from failure, not just success and that teacher control of learning needs to be relaxed.

Donna described working in a comfortable and supportive learning environment. Both her current (Wisconsin) and past (Ohio) schools provided good access to technologies through computer labs and mobile programs. Typically, inconsistent

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bandwidth had impacted working modes, although in her new school this was better, however high demands for devices negated 100% student access to technologies each day. In her classroom, Donna encourages the use of multiple technologies while ensuring students understand appropriate times and behaviours to be using these, and this is supported by the liberalism of her current district. She firmly believes student work should be visible beyond the classroom and to the world as it makes learning authentic. She encourages her high school students to be open online in a carefully planned and supportive way using strategies such as asking students to consider and create their online brand. She also helped implement a gradual blogging immersion program where students blog within the class, across classes and then across the entire senior school, "I just see as the audience becomes broader they become much more conscious of how they're writing, what they're saying and how what they're saying may be perceived by someone else".

At her previous school Donna initially worked with the curriculum director and another colleague to plan and design learning in an interdisciplinary approach for two classes - a computer class and a world studies class. As a next step they thought how great it would be to be able to introduce students to other cultures, related to the world history course. With this new approach in motion Donna started attending conferences with colleagues, finding new collegial networks, sharing and building further understanding through being active with the online global collaboration education community.

Donna believes success with online global collaboration hinges on a teacher's attitude and willingness to be flexible and not always the master in the classroom. A teacher's mindset may be a barrier - and changing the prevailing attitude is a challenge Donna struggles with. She totally understands that teachers can be overwhelmed with expectations from national and local government bodies, however the technology is largely in place for online global collaboration: finding a pathway for teachers to take on this "extra work" is now the challenge.

Donna admitted to a higher comfort level than other educators when using technology in the classroom and had come to expect it to be always available as a

resource. This change in her teaching approach meant that to not have technology now feels uncomfortable for learning. She also could not imagine a classroom where students do not communicate with others online and her students often shared with her how they felt disconnected in other classrooms where online connections and global projects are not embedded; they missed the dynamics of that connected classroom environment.

The revolution in Donna's teaching came through having a network of teachers who also have a passion for global collaboration: this changed her approach to teaching and how she thinks about education. She is now more flexible, open to risk taking and centred on what students need to be successful. She gives her students time to explore and discover and is comfortable and flexible with mistakes and 'on the job' learning. Above all, she indicated that learning happens in the moment, it doesn't always have to be neat and the script doesn't have to be created ahead of time.

One major shift in Donna's teaching was the realisation that students could teach the teacher and that both stakeholders could sit side-by-side supported by ubiquitous technology to learn and discover together. Learning with and from students often happens in this type of learning and is not unique to Donna in the data collected. Accepting that some things fail has led to a huge shift to feeling more comfortable taking risks, and improved confidence as an educator.

5.3.2.3.3 Pedagogy, curriculum and school culture.

Aligned with responses to research sub-questions two and three, Donna believed online global collaboration is both a pedagogy and a curriculum and as a teacher global collaboration is the way you are doing business, so it is part of the "how"; for embedding into the curriculum; it is a piece of your learning, of student's learning; and it's part of your philosophy as a teacher. She talked about the expectation that educational curriculum includes rigour and critical thinking in order to make sure students in the USA perform competitively with those outside. However, although her colleagues see it as one more thing to do in a busy day, Donna believes global collaborative practices should be embedded in everything they do. In line with this

belief, Donna also stated school culture must change because everything is connected, the world is connected and people do not learn and produce in isolation. She sees creativity as coming from teamwork and collaboration and a classroom where there are no walls or boundaries.

5.3.3 Global Collaborator #3: Susan - 'Reluctant Outlier'.

Susan models reading and literacy to her students by personally reading and writing each day. Her passion for connecting beyond the classroom to support literacy and other learning objectives is articulated in this interview, as she "straight talks" what she thinks should be happening in the global collaborative classroom.

5.3.3.1 Profile of Susan.

At the time of this interview, Susan was a Grade 5 teacher at an international school in South America. She considered herself very connected online through different social media sites, especially Twitter, and leveraged these connections for her own professional learning. Her class participated in a variety of online global collaborative learning experiences including Mystery Skypes, the Global Read Aloud project in October and Global Read Aloud Day in February.

Metaphor - 'Reluctant Outlier'

- **Description:** Actively plans and participates in online activities and, despite school resistance, joins her classroom with others globally for collaboration
- **Disposition:** Would prefer to work within the 'system' (hence the 'reluctant' outlier), but elects to work outside as needed to meet learning goals for students; connected and collaborative learning is pedagogy everyone should adopt; always positive about better learning outcomes

Key qualities

- **Learner:** Has clear ideas and motivations for what learning is; visibility in online spaces is important; constructivist approach
- **Professional capacity:** Strong use of social media to connect beyond the school; interacts with and learns from online networks
- **Leadership:** Leads for improved literacy across all modes of learning; an unrecognised role model within the school
- **Digital competency:** Fluent with a range of digital tools for learning; models best practice online contribution and collaboration for students

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Reading and literacy is a major focus in Susan's classroom - she reads everyday to the students, and connects regularly to authors via Skype who converse with the students. She aligns all online and collaborative work to curriculum purposes and does not feel like she is doing enough within the school to promote and encourage participation in global collaboration. About online global collaboration she stated:

> I think I've done a little bit of collaborating where we've creating things together but I feel like that's something I still have yet to do. I've joined things that have been established but creating something myself or in conjunction with someone else that's new that's different, I feel like that's something, maybe the next step I can take.

Susan's metaphor and qualities as the 'reluctant outlier' are revealed further in Figure 5.6.

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Susan	50-59	International	Ecuador South America	Grade 5	26-30 years
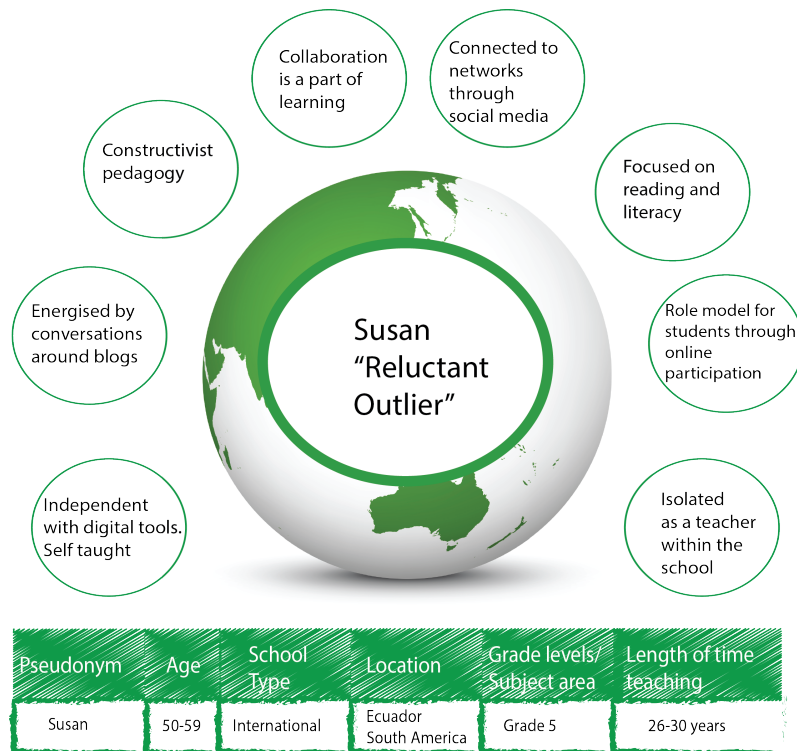
Figure 5.6. Profile summary of Susan: 'Reluctant outlier'

5.3.3.2 Phase 1: Survey responses – Susan.

This section documents some of the initial data Susan shared via the Phase 1: Online survey. Through the lens of the Taxonomy of Global Connection Susan revealed that levels 1, 3 and 4 are occasionally represented as part of classroom implementation, with level 2 very rarely implemented (Figure 5.7). There are a handful of projects that Susan nominated as being of Level 2, 3, 4 or 5 that she

participated in that ran for a minimum of six weeks. The first is the 'Global Read Aloud', also described as her favourite online global project because it involved reading aloud, which is something she loves to do with her students and because it allows students to engage with others online around a common topic. Another is a reading project with several other grade 4 and 5 classrooms primarily in the US, called 'Fish in a Tree'. She also joined a global blogging challenge set up by a teacher in the US with participants from Europe, Africa and Asia.
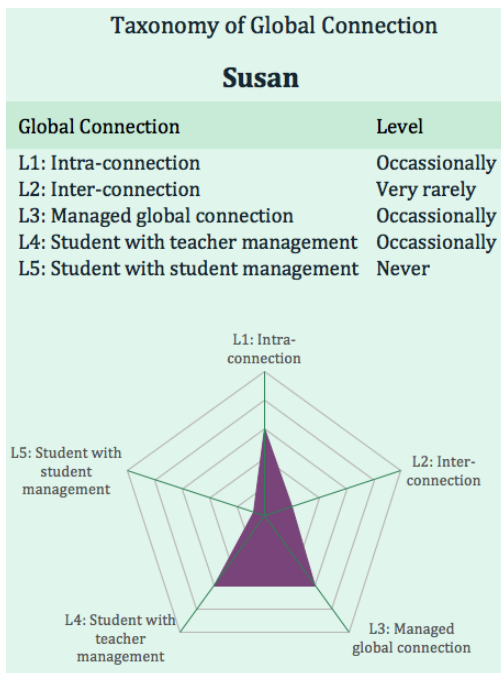
Figure 5.7. Susan's collaboration aligned with the Taxonomy of Global Connection

5.3.3.3 Phase 2: The interview – Susan.

Susan shared how she designs and implements an engaging classroom that connects locally as well as globally. She talked about how important it was for student motivation for improved literacy and the role technology and global connections play to provide engagement and opportunity.

5.3.3.3.1 Experiences with online global collaboration.

Connecting with others in different parts of the world to work on a project, to collaborate "teacher-to-teacher" or "classroom-to-classroom" is how Susan defined online global collaboration. However, she is very quick to add that although she has already completed a lot of online connections with other classrooms, and joined

other people's project initiatives, she has not participated in very much collaborating where all parties have created something together. The actual creation of something like a global collaboration herself or in conjunction with someone else would be a new experience and the next step she would like to take.

Here is an example of the multi-modal nature of global connections expedited by Susan:

> We read a book together with several other classrooms 'Fish in a Tree' and we met online several times to talk about the book. First we did a Mystery Skype to start off and then we fielded questions to each other. We talked about the characters, we talked about what we liked about the book, what we didn't like about the book. We also listened to the author, she answered questions, and so we submitted some questions to the author. As part of that one of the teachers put together a Padlet for everyone to do final reflections.

In Susan's opinion, it is important for the teacher to also participate in online participatory learning through writing, contributing, blogging, tweeting and interacting via other social media as she explained, "How can I help my kids see the value of it if I don't see the value of it - if I'm not participating?". Table 5.6 reveals current synchronous and asynchronous technologies and how Susan and her students used them.

Table 5.6

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Susan

	Synchronous technologies	Asynchronous technologies
Personal learning	**Online workshops** • Participated in online workshops (mostly self-selected) on various topics of personal interest. • Always transfers learning experiences from PD to classroom practice.	**Blog** • Professional blog used to reflect on teaching. • Reads and subscribes to many teacher blogs to gain valuable learning for immediate classroom use.
Student learning	**Skype** • Mystery Skype	**Padlet** • Padlet - pose a question and students respond.

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.7. For Susan, one enabler impacting online collaborative learning was a supportive Technology Director. This person, in his second year at the school, was an advocate for social media connections and student exploration of new learning modes "out there" online. The school now had improved bandwidth and a BYOD program at some grade levels. Parental support for student-owned technology earlier than initially required was also an enabler, making it easier to do things than without the technology. Susan shared how she spent time and effort raising awareness of her global activities with the school principal and other administrators, often inviting them into her classroom.

Table 5.7

Enablers, Barriers and Outcomes of Online Global Collaboration: Susan

Enablers	Barriers	Outcomes
• Supportive tech director • Wider bandwidth this year • Some BYOD classes • Communication with parents to support mobile and online learning • Inviting administration into activities and keeping them informed • No major restrictions on technology use - websites not blocked • Being open to participate in different activities	• Exclusion from BYOD program • Isolation as a teacher - nobody else in the school doing this • Low technology skills amongst other teachers • Lack of connected learning and teaching • Lack of understanding how to communicate and learn with others at a distance - teachers have not experienced this themselves	• Enjoyment in learning • Broaden global perspectives

Susan had struggled with what she calls 'difficulties' (as opposed to setbacks) and they outnumbered enablers. To gain a BYOD status in her classroom, rather than waiting her turn the next academic year, she wrote to parents asking for them to buy devices earlier for their children because she wanted her students to learn online and use different websites, resources and social media sites.

The isolation Susan felt in the school and the fact nobody else was doing the things she did in the classroom became a catalyst for other barriers. Although she had tried to share and open up her classroom to colleagues she continued to feel

alone. "I feel like a lot of the teachers at my school are not so tech savvy, they do not see the value in being connected", and Susan also shared:

> I think that sometimes people see it as you know, like how could you actually have any kind of connection or relationship with anyone you have never met? I think it's because they are not doing it themselves, you know if you don't read how can you actually teach your kids about reading about books?

According to Susan, enjoyment in learning was one of the main outcomes of online global collaboration. She prefaced this with the need for students to understand what they are doing and the purpose of it. An activity like a Mystery Skype, for example, then becomes very enjoyable for the students. Another important outcome was the opportunity to broaden individual perspectives. Participating in a Mystery Skype allowed students to connect with peers and have conversations around what each is thinking. This usually sparked an interest in where the partners were from geographically and what they did there. Susan mentioned she heard through her Voxer network that students were researching more meaningfully into their partner's location and global situation after a Skype session, and she wanted to also do that.

5.3.3.3.2 Approaches and beliefs to do with online global collaboration.

Susan understands technology and openly shares her work online. She uses a variety of tools to support collaboration and works hard to integrate mobile technologies into learning. Susan's school opened most online spaces and tools and teachers request for something to be unblocked if needed. YouTube is accessible by students and the only sites that are really blocked are those categorised as game sites, which Susan stated is "unfortunate because some of them are educational". Susan uses the tool Edmodo to post information and start conversations as she said it teaches the students appropriate ways of commenting and responding to people virtually.

Putting learning online and making it visible to others was very important to Susan. She had personally written a blog for many years, with what she called "variable energy". During the interview however she confessed that this year she was trying to write everyday and to experience what her students were experiencing

when they write. Although students had some fluency with digital tools, including social media, they did not know how to learn effectively with them. The class blog is currently closed to the world, although it had been open recently for others to view. "So the rest of this year part of my focus is on blogging, the kids getting out there, putting themselves out there. Quadblogging is one way". Susan participated in a quadblogging classroom challenge that evolved over a whole year. She has changed schools since then and wants to try it again, stating "I find it really powerful when there are conversations taking place on blogs and people start talking about other people's posts on their blogs. It's cross-pollination going on and ideas spreading and I really learn a lot from that".

A lot of the teachers Susan works with are not very tech savvy and do not see the value in being connected. She made a distinction between older and younger teachers and remarked:

> I find the younger teachers don't see it as something worthwhile. I see that in my professional learning network online. It's like the 40s, 50s and up there seems to be more teachers in that age range who are doing really interesting and amazing things.

Susan's online global collaboration skills have been developed independently from any professional learning offered in her school. She stated, "I don't prepare formally in any way I just plunge, that's usually what I do just plunge in and just start and see how it works and figure out how to make it better the next time". She also commented about a lack of support from within her school, "You know, I don't get a very positive feel from a lot of people", but her own participation had helped her see the value and inspired her to bring these connected learning experiences to her students. She said, "I feel like sometimes when I mention all this, you know social media and all this people kind of snicker, especially with respect to kids".

Embedded into Susan's everyday practice is connecting with her online learning network. She uses Twitter a lot and recently joined a Voxer group, which she found via a chat, called EdBeat. She wanted to connect with others who are like-minded, and who participate in and are supportive of online collaboration.

Susan declared she is a constructivist teacher and believes in looking at all aspects of the child - trying to give students ownership and choices in the classroom. She believes they need to be able to identify problems and solve them, and more importantly direct their own learning, and she provides the space for them to do this. One story concerned a new writing program implemented in the school where the "expert consultant" advised not to give students a choice in what they were writing about. Susan noticed students were not enjoying writing under that condition so implemented Fridays as their day to choose what they wanted. Although she said it was a compromise and not ideal, as she prefers every day to be the student's day of choice.

The use of devices in the classroom has changed Susan's approach to learning in an unexpected way. In an ideal world she wants devices on the desk and available anytime for use. However, she struggled with open access to the internet and what students may be doing and whether they were distracted or not. With little guidance from the school, her method was to have the devices put away unless they are out for a specific purpose. Interestingly she was seeking help from her network and online resources in order to figure out the best approach. Susan tried to set up her classroom so that students were in pairs or small groups so that they do something together, create something and then present. She reflected that students do not need any special teaching for this, but then in an online context she cannot take it for granted that they know what to do, "So I need to think about how we get into more situations where they are putting themselves and their ideas or whatever out in public".

Communication is a key attribute of a capable educator in Susan's eyes. She spoke at length about being a sensitive and responsive online learner, how to use the technology to communicate, such as Twitter, and how to respond to others honestly and positively. When collaborating beyond the classroom Susan was very aware of how busy educators are and how some are not able to follow through on their commitment. She knew from experience that organisation was essential when committing to connect and collaborate with others beyond the school and acknowledged how disappointing it was for students when global partners did not follow through and respond in a timely manner.

5.3.3.3.3 Pedagogy, curriculum and school culture.

When asked about online global collaboration in terms of being pedagogy or curriculum, Susan reflected:

> I don't see it that much as a curriculum, more as pedagogy. I mean it's another way of learning, it's another way of learning with people who are not right next to you but who have a different perspective who have different things to offer, who can teach and you can teach and learn from each other, and I think it requires some different things and different types of pedagogy.

Susan believes it is important to realise our lives are much more connected now through the use of technology and social media and through people sharing across the world. It is important that educators and students learn to use new communication tools such as Twitter or blogging. She thinks there has to be a culture change as part of this recognition that information sharing is vital. Reading and sharing and contributing is an important shift - and Susan said her school is starting to "put it out there now" with a Twitter account and Facebook page. They are posting more online and encouraging parents to go online to read their child's report card, to see progress and to get information. Susan also stated that her Principal currently wrote a blog for internal reading and teachers use Facebook for personal reasons, but this is slowly changing to include professional objectives. Moving completely to BYOD next year will affect more of a change in the school. Valuing activities like reflection on learning and teaching and putting thoughts online for others within as well as beyond the school community for responses was part of this shift in culture. Expounding on this Susan saw online global collaboration as requiring:

> A different kind of communication, an awareness that the other is not right next to you, an awareness that you are talking to someone that you don't really know everything about, but that you are trying to connect with for learning purposes either to teach them or learn from them.

Susan argued, "It's happening but it's definitely necessary if it's going to be not just 'oddball' down the hall who's doing the Mystery Skypes and it's an expectation that everybody become more connected".

5.3.4 Global Collaborator #4: Meredith - 'Catalyst for Change'.

Meredith, the youngest educator interviewed for this case study, had a certain confidence and an impressive depth of professionalism. She also spoke with authority about connected and global learning in her classroom.

5.3.4.1 Profile of Meredith.

Meredith was teaching at a small school in rural Manitoba, Canada, with about 140 students in K-5. Her teaching experience totalled a mere seven years, five of these in early years. At the time of the interview Meredith was the only Grade 1 teacher and had a class of 21 students. She shared that an interdisciplinary curriculum approach is typical of the Grade 1 age level and in her school and students have external teachers for music, physical education and gym class.

Metaphor - 'Catalyst for Change'

- **Description**: Classroom practices provide a microcosm of how learning takes place while connected online and collaborating with the world
- **Disposition**: Barriers can be overcome, online global collaboration is engaging and builds excitement for learning and it's the way we learn; global collaboration is not an add-on

Key qualities:

- **Learner**: Flexible and adaptive approach to learning; finds opportunities for students to learn in different ways with others within and beyond; collaboration skills can be taught
- **Professional capacity**: Established a global network of like-minded educators to learn with and from; collaboration has informed teaching practice
- **Leadership**: Teacher-centred control of technology; manages learning online for younger students and leads digital citizenship development; drives visibility of learning through class blog and publishing student work online
- **Digital competency**: Uses technology ubiquitously to make vital connections and as a scaffold for students to communicate

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Further details about Meredith profiled as the 'Catalyst for change' are found below in Figure 5.8.

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Meredith	20-29	Government	Rural Canada	Grade 1	6-10 years
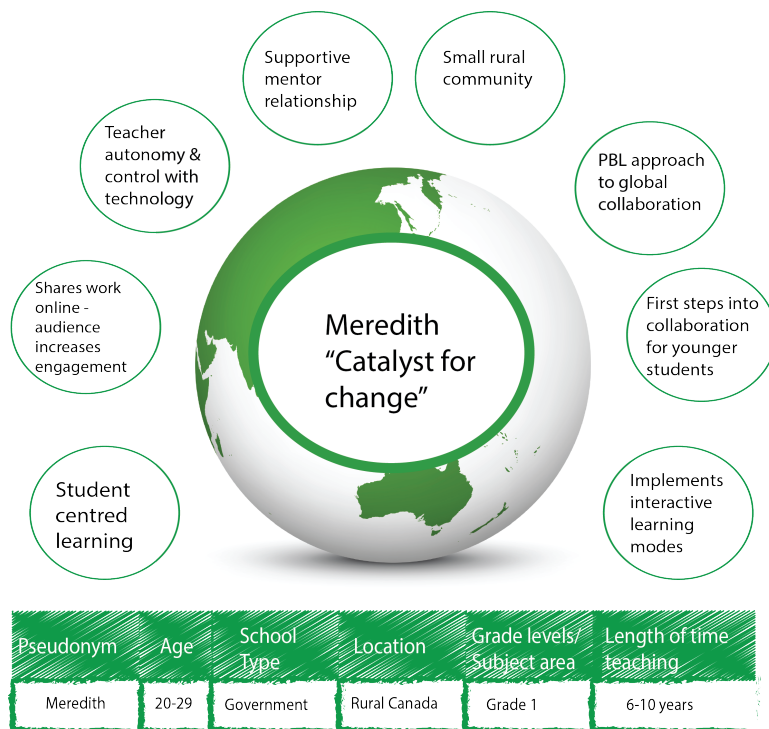
Figure 5.8. Profile summary of Meredith: 'Catalyst for change'

5.3.4.2 Phase 1: Survey responses – Meredith.

This section documents some of the initial data Meredith shared via the Phase 1: Online survey. The lens of the Taxonomy of Global Connection (Figure 5.9) shows that all five levels are represented as part of Meredith's classroom implementation, with Levels 3-4 listed as 'Frequently', and Level 2: Interconnection (within the classroom) as 'Very frequently'. Meredith nominated two online global collaborations of Level 2, 3, 4 or 5 that she had participated in that run for a minimum of 6-weeks. These are 'Flat Matt project' (http://adventuresofmatthewandjim.blogspot.ie/) and 'Global Read Aloud' (http://www.globalreadaloud.com/). In response to the question about a favourite online global collaboration, Meredith shared:

> The 'Kids Who Code Code-a-thon' was a student-led coding event held on December 12th, 2014, during the Hour of Code celebration week. Students from two schools worked together online to plan the event and then met face to face to co-host the Code-a-thon. Through technology our classes also connected with coding experts, other classrooms and coding app creators.

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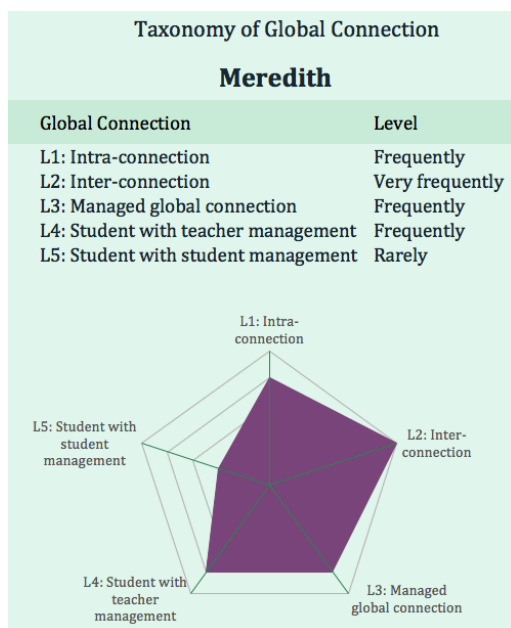
Figure 5.9. Meredith's collaboration aligned with the Taxonomy of Global Connection

5.3.4.3 Phase 2: The interview – Meredith.

Through strong mentorship and external opportunities, Meredith is a rising star with new approaches to learning while connecting and collaborating globally. She approached the interview methodically, ready to share and comment on global collaboration, and articulated her experiences and beliefs in education with confidence.

5.3.4.3.1 Experiences with online global collaboration.

As the only Grade 1 teacher in the school Meredith had no immediate collaborators for curriculum. Beyond the school, the local school division was also quite limiting in terms of collaborative partners. On one day per year, the school division organises a meetup of early years' teachers with similar levels, where divisional consultants lead a meeting and discussion, share resources and ideas. At this event there is apparently limited sharing of technology use, although resources are shared online through the divisional file-sharing system. Typically, teachers do not use collaborative planning tools, as the division does not provide them. Meredith independently used OneDrive when collaborating with her colleague at another school to plan, write grants and reflections. Being a small rural school there was no excess budget for technology. However, the school supported Meredith's grant

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writing that successfully equipped her classroom with six Windows devices, five laptops and additional desktops and six iPads. Through Manitoba's recently updated division policy Meredith had access to almost anything online, while student accounts continued to be filtered and blocked. Table 5.8 reveals current synchronous and asynchronous technologies and how Meredith and her students use them.

Table 5.8

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Meredith

	Synchronous technologies	Asynchronous technologies
Personal learning	**Skype, Google Hangout, online webinars** • Attending webinars • Connecting with teachers around the world to share ideas • Presenting information • Collaborative planning • Sharing classroom practice	**Blog** • Blogging • Share ideas and work samples from the classroom • Reflect on professional learning • Read blog posts to learn new things • Find ideas and inspiration for teaching
Student learning	Skype To support learning • Connect with experts relevant to topics studied or projects working on • Connect with other classrooms, e.g. Mystery Number Skype to practice Math skills • Meeting with partner classrooms when working together on collaborative projects to brainstorm ideas, review progress, make joint decisions	Blog • Students share learning and work samples using KidBlog. • Students share their ideas and respond to others' posts.

According to Meredith she was the only teacher in her school integrating online global collaboration into the curriculum. Meredith described collaborative learning in the classroom as "going online to reach out to people and bring them into kind of what you're experiencing so that you can work together and enhance and support learning in that way". This included activities such as Skyping with another class or with experts, like authors. Meredith shared that connecting with other classes might also involve students gathering on the 'learning carpet' in front of the interactive whiteboard and conversing with the other class about what they are learning or what project they would like to tackle together, determining learning goals and then who

in which class is going to do which piece of the collaborative project. Meredith explained how online interaction takes a variety of forms:

> Sometimes it might be email coming to me, since my students don't have their own email at age 6, and I'm sharing that, or once my students had the use of social media like Twitter modelled for them then they will actually start to take over, asking 'can I share this with another class?' But with young learners often many of our interactions are whole group, especially at the start, just for that modelling and my support for them.

Over the years, Meredith had been involved in much online global collaboration, and each year she engages in a project-based collaboration between two classrooms where students go through the steps of Project Based Learning (PBL) virtually and invite others in as it fits.

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.9. Once Meredith's students know what is possible through connecting with other classes they ask for it and accommodate it, even expect it to be integrated into their learning. As she explained:

> There's that actual face-to-face interaction on Skype and then there's all the work that goes into it to get ready for the next step which may not be connected, it depends what they've had experience with. This year we've had a variety of different partners to work with and often they will say, 'Hey I wrote a great math story today and I'd really like another class to solve it so can I send it to our partner class in Ohio?' and they will start to ask that, but if they've never been exposed to other partners or other options of course that is not going to happen in most cases because they don't know what's out there.

Meredith shared a personal interest in finding out how technology can transform and enhance learning and how a shift takes place in a school to teacher-centred control of technology. She shared how over the past few years the district had moved from a technician-centred to teacher-centred control of classroom technology. This shift provided more freedom and enabled Meredith to scale up collaborative efforts because of the freedom to make choices and install and manage technology tools herself such as Skype.

Table 5.9

Enablers, Barriers and Outcomes of Online Global Collaboration: Meredith

Enablers	Barriers	Outcomes
• Personal interest • Teacher-centred control of technology • Supportive administration • Teacher accountability • Audience - being able to share learning with those beyond the classroom • Student experience - once they know what the possibilities are they expect to be able to work in collaborative modes • Mentor connection - like-minded teacher partner	• Policies prevented tools from being unblocked, but many have been relaxed • Focus on content learning rather than process • Partners not aware of communication and collaboration protocols	• Rich, deep learning • Future strong recall of activities and associated knowledge • High engagement that is shared with families and others beyond the classroom • Empowerment to make a difference somehow - realisation that actions have an impact • Students more engaged, less disruptive • Motivation increased due to sharing with a wider audience - taking more care with work to 'polish' it before putting online • Access to globally diverse learners to develop cultural awareness and respect • Establishment of a global teacher network

Meredith was enthusiastic about the positive outcomes of online global collaboration in the classroom. In terms of rich, deep learning she stated:

> Often students in higher grades that have engaged in this kind of learning come back into my room and say as a guest speaker they do have really strong recall not only of the activities but the knowledge that went with it.

Often Meredith heard comments from students and parents related to high engagement and excitement about learning. Empowerment of learners was also an important outcome, "because kids realise that they, the kinds of projects we do, often involve tackling a problem or making a difference somehow". Meredith's learners are very young and yet they realise that their actions do have an impact and the effect can reach within and beyond their own school to another country, province or city. In addition, Meredith shared that, "Often students are more engaged and less disruptive if they have a special role in a project like that, I guess it's partly just the accountability to another class, another teacher and the high engagement tends to reduce that".

Having an audience for student output is a major advantage, being able to share learning beyond and having peers and others seeing it is important, as Meredith said,

"I think that audience really increases motivation and the drive to really do a good job and to polish our work if it's seen online by other classrooms". Access to globally diverse partners was also an important learning outcome. As a teacher, Meredith considers developing a substantial global network for and as a result of online global collaboration an important outcome that allowed her to share ideas and receive support.

5.3.4.3.2 Approaches and beliefs to do with online global collaboration.

Meredith embraces new ideas and working modes through her strong beliefs in the efficacy of online global collaborative learning. She claimed to be very comfortable with digital technologies and coped with school logistics, largely because she had a lot of practice doing so. She had worked out satisfactory management of digital technologies with young people. For example, she used a school Skype account as it is against the rules for students to have a personal Skype account. However, she was not comfortable with all students having the password for this account, therefore students tend to Skype and tweet from one place in the classroom so that Meredith can monitor and approve before connecting or sending.

In the classroom, Meredith had a class blog where she and the students could post things together. They also regularly used Twitter, YouTube and Instagram to share work. Independent student blogging had not been as sustainable given the age of students, their early reading abilities, and the time involved learning the tool. However, Meredith worked consistently on raising student awareness of online learning and the permanence of putting things online, stating, "Beyond just the motivation and empowerment of sharing their learning is the opportunity to teach digital citizenship".

Meredith knows that professional growth and transformation of her teaching to more effective, deeper and meaningful engagement with the students had occurred through engaging in collaborative learning. Her involvement with the Microsoft Educator program provided some of the theoretical framework in support of why students needed to learn communication and collaboration skills through the use of IT. She also joined in Twitter chats where she was exposed to new and different

ideas. An important addition to these activities was Meredith's mentor teacher and one of her biggest collaborative partners. The opportunity to co-teach with this partner when still a pre-service student teacher was a big learning experience and prepared her, "as much as you can be prepared" for online global collaboration.

As an early year's teacher, flexibility with classroom curriculum afforded by this position was key to global, collaborative success. According to Meredith, she was already responsible for a number of subject areas, had outcomes to teach for these areas and was with her students in the classroom for a large percentage of the school day. In the classroom, she had a teacher station connected to an interactive whiteboard and Apple TV and it was there that she did a lot of the online collaboration. As she explained, "Because it allows students to come up and interact while everyone can see, which is really important for young learners to be able to feel actively involved".

Meredith discussed how her approach had changed such that rather than laying out the curriculum and outcomes, she provided student choice for areas of interest and then figured out what curriculum and outcomes would help them reach their goal. Her motivation for this approach came from wanting to always do what was best for the students. Digital technologies have consistently been available during her relatively short teaching years, so the impact or change in teaching approach through adoption of new technologies had not been as great. Practice and experience with the technologies was the key according to Meredith. In addition, working out how young children access technology and how to support their learning while connected to the internet. Online global collaboration has helped Meredith realise the value in students sharing their ideas and learning with a variety of global partners.

Meredith spoke at length about how she prepared her students for global collaboration and the behaviours she expected them to learn and use. Often these included becoming more culturally aware of what others may do online and how to react and learn from that, as she related:

> At the start of this year we kicked off with 'Global Read Aloud' so we were Skyping into a lot of different classrooms so we just talked about what we needed to be doing on each of those calls and made a simple bulleted list …

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in kid friendly language like 'we listen carefully to what they are saying' 'we put our hand up if we have something to say' 'we use a loud clear voice when we are speaking' 'we sit criss-cross applesauce and stay in one spot so they can see where we are and what we are doing' and that's one of the big things. Sometimes if there's a cultural difference other classes will, or even other teachers will share things that maybe I wouldn't have.

5.3.4.3.3 Pedagogy, curriculum and school culture.

For Meredith, global collaboration is more of a way of teaching and learning, a pedagogy, rather than an additional curriculum, although it is embedded in the curriculum through ties with social studies. She was enthusiastic about teaching students to live with a more global mindset as a realistic and valuable approach in the current socio-political climate. Global collaboration addresses curriculum outcomes and builds important skills and in Meredith's classroom it is not an add-on. However, there were challenges, and Meredith explained her dilemma about how to extend this to other educators and schools:

> It's [global collaboration] a part of how we learn and recognising that many or most adults learn in a global context and that's important for children too. And how we do that I don't know. I'm glad there's people like you because I'm not sure how we're going to tackle that. I guess I know I try to tackle it by really trying to help others see the value in this for our students and realise that it can be part of doing what is best for learners and it does not need to be seen as detrimental to traditional academics.

To move other educators into the online global collaboration pedagogical mode Meredith suggested the best approach was likely targeted professional learning in conjunction with coaching and support (mentoring), and a shift in educational beliefs away from content mastery.

5.4 Global Collaborative Educators Whose Role is Both as a Specialist and as a Classroom Teacher

This second group of educators, Stella and Jill, had a dual role of specialism within the school as well as being a classroom teacher with their own classes.

5.4.1 Global Collaborator #5: Stella - 'Intrepid Communicator'.

As a mature educator, Stella's experiences are shaped by a love of international travel, an understanding of how to use online technologies and a passion to bring the

world into the lives of her students who, in her words, are culturally and geographically isolated. She shared optimism about collaboration and a dedication to forge new pathways within the education system.

5.4.1.1 Profile of Stella.

At the time of this research, Stella taught ICT, accounting and business in a rural Victorian (Australia) Pre K-12 state school to mainly Years 7-12 and implemented global collaborative type projects with Years 7-11. She also supported technology integration throughout the school. Her global activity spanned many years and included participation on the leadership team for the Global Education Conference, a Flat Connections Global Educator, Global Classroom Lead Teacher, Skype Master Teacher and Communications Chair for the ISTE Global Collaboration Professional Learning Network. Within her school, she is the catalyst for virtual interactions and collaborations with others beyond.

Metaphor - 'Intrepid Communicator'

- **Description**: Enhanced online communication skills has afforded an extensive global network to be leveraged for classroom connection and collaboration
- **Disposition**: Will connect and collaborate with all who are willing in order to enhance global learning; global connection is imperative to learning today

Key qualities

- **Learner:** Self-determined, works within the system trying new things; pushes boundaries; 'learning right now' approach
- **Professional capacity:** Diverse teaching and support role; conference presentations; digital scholarship and reflective practice through blog and other online spaces; global network
- **Leadership**: Involved; hands-on approach; mentor for others; builds empathy in learning
- **Digital competency:** Positive approach to technology; explores new tools for online global work

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Stella makes things happen - she communicates comfortably across borders, joins in and creates opportunities for other educators and students. Her effective communication and collaboration skills situate her as a leader within the school and

across her extended global network. Details of her profile as the 'Intrepid Communicator' are also found in Figure 5.10.

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Stella	60+	Government	Rural, Australia	ICT specialist, 7-12	30+ years
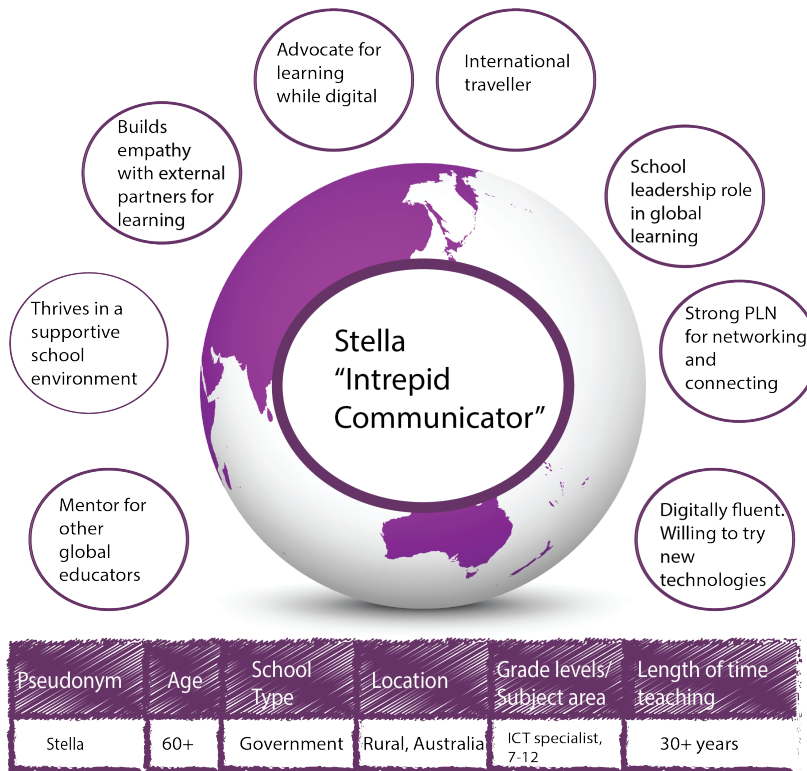
Figure 5.10. Profile summary of Stella: 'Intrepid Communicator'

5.4.1.2 Phase 1: Survey responses – Stella.

This section documents initial data Stella shared via the Phase 1: Online survey. The lens of the Taxonomy of Global Connection (Figure 5.11) shares that all five levels are represented as part of Stella's classroom implementation, with Levels 1-4 listed as 'frequently', and level 5 'occasionally'. The project that she nominated as being of Level 2, 3, 4 or 5 that ran for a minimum of six weeks, is called 'Connect with China Collaborative' (http://www.flatconnections.com/connect-with-china/). When asked about her favourite online global collaboration for students Stella provided this description as part of the Phase 1 survey responses:

> The Flat Connections Global Project - this project pushes the use of technology and demonstrates the amazing capacity to enable true global collaboration. Staff are mentored and updated regularly so that they can connect and collaborate together. There is a mix of tools to do so. Students can socialize and learn about each other at their curiosity level, are mixed in groups globally and interact through a number of tools. Finally, there are published outcomes including the results of research and a movie to

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summarize their findings. It has everything for true collaboration - not only for teachers but students and prepares us all for the global world that is increasingly ours.
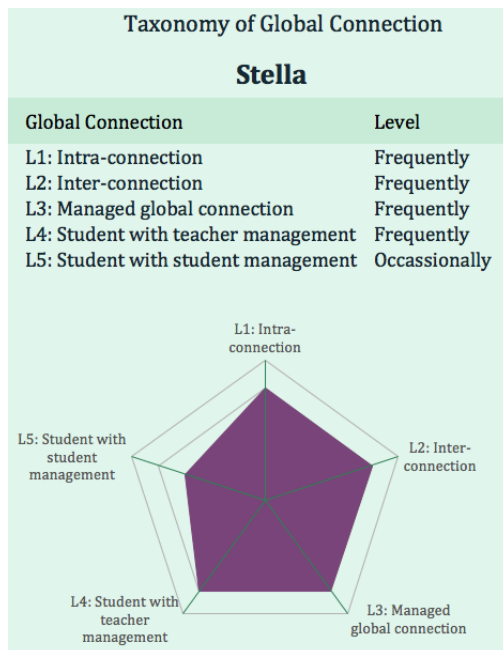
Figure 5.11. Stella's collaboration aligned with the Taxonomy of Global Connection

5.4.1.3 Phase 2: The interview – Stella.

Stella was animated during the interview and comfortable sharing how she implemented online global collaboration within the context of her school. She has presented at many conferences and it was obvious that this was not the first time she had articulated thoughts and shared experiences around this topic.

5.4.1.3.1 Experiences with online global collaboration.

Stella expects students to be learning from others online and at a distance rather than only reading textbooks or looking up things online that might help them. In her view, the experience of connecting and collaborating with others is a forerunner and catalyst for further research as interest is piqued about the location and lifestyle of the partner collaborators. In her classroom, online global collaboration often takes place in what is called a 'backchannel', a chat forum where questions and comments can be posted in real time and asynchronously. Stella shared how her students loved the social element to online collaboration: they ask a variety of questions and this is usually "beyond textbook learning". When sharing answers themselves Stella

believes student confidence is boosted and a deeper knowledge of Australia, the country and culture, is fostered with enhanced understanding of the advantages of living there. When asked what online global collaboration in the classroom is, Stella revealed:

> I think it's interaction between people in other countries around the globe, I think there has to be that interaction to make the learning more meaningful and engaging. It allows the students to follow their own curiosity and inquisitiveness. I think the connection leads to interaction and that leads to a global sort of, globally developed product or outcome. So whether it be some knowledge that they gained or whether it be a more formal type of global project that we've been involved in I think that students and I learn a lot more beyond the textbook for a start. So we start to learn a lot more from people and with people.

As an early adopter, Stella realised the benefits and opportunities new technologies could bring to global collaboration and the possibilities for her students. She shared how rural isolation means that students have very little idea about the world and the people in it. In the classroom, Stella blends synchronous with asynchronous communication modes, doing more of the latter with Years 9-11. The synchronous is quite short and impromptu depending on availability of partners who are often Chinese and non-English speaking countries close in time zone to Australia. Asynchronous communication tends to be with English speaking countries, students typically have an opportunity to respond to discussions and share blog posts. Stella was usually the initiator of these learning experiences. The more recent development of the Australian National Curriculum with a focus on intercultural understanding had reinforced Stella's approach and made her more aware of how important this element is for learning, especially engagement with an Asia context. Table 5.10 reveals current synchronous and asynchronous technologies and how Stella and her students use them.

Table 5.10

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Stella

	Synchronous technologies	Asynchronous technologies
	Skype, Google Hangout, Zoom, Adobe Connect, Fuze, Blackboard Collaborate, MS Lync	**Wiki, Blog, Google docs, Padlet**
Personal learning	Adobe Connect for personal and professional learning. • Professional weekly webinar (Tech Talk Tuesdays) - formal presenter or a general sharing and discussion session amongst participants • Education department subscribes for all Victorian teachers.	• Reads a variety of blogs to learn what others are doing in the classroom. • Asks questions via blog comments and receives alerts when further comments or responses are made.
	Skype, Blackboard Collaborate, Google apps	**Blog**
Student learning	An example activity: • Students in Ipoh, Malaysia and Stella's school were placed in small groups of 4-6 students across countries. • It was International Friendship Day. 10 documents were created in total - one for each group. • The links were shared. • Skype was used to show the classroom activities in both countries and the groups of students proceeded to answer set questions.	• Blogging with all students. This becomes a digital portfolio and a space for reflection of learning. • Personal blog used to share class tasks. Students regularly write posts and will sometimes get comments from others across the world asking questions or sharing their way of doing things.

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.11. For Stella, enablers for online global collaboration include online networks of like-minded educators and structured projects. According to Stella, a strong personal learning network (PLN) that involves trustworthy colleagues through which to build understanding was a bridge to meaningful global connections and collaborations. Through email, and more recently Web 2.0 technologies such as Ning, Twitter, Skype and wiki, Stella had learned and shared with her peers in order to build understanding around how students could collaborate with each other. Organised and structured online global projects that bring like-minded educators together are also enablers. Stella declared

there were many stories she could tell about real connections with people across the world, and how she had leveraged these for vital global activities and understanding. She emphasised also how online global collaboration is enabled further by a supportive leadership team, parents, and community who want students to 'burst the bubble' of living in an isolated community.

Table 5.11

Enablers, Barriers and Outcomes of Online Global Collaboration: Stella

Enablers	Barriers	Outcomes
• Strong PLN • A small and close trusting global network • Use of Web 2.0 • Mutual sharing with peers • Participation in existing global projects that lead to more connections • Supportive leadership team • Supportive parents and community • Technology infrastructure (recent improvements)	• Time zones • Different cultures • School holidays and schedules • Technology confidence • Educator mindsets • Language communication • Lack of priority within a school • Data collection on literacy and numeracy • Crowded curriculum • Time-poor teachers	• Inquiry-based learning • Deeper knowledge of own culture and country • Builds confidence in online communication • Develops multiple communication strategies beyond spoken English • Fosters new approaches to 'visible learning' while online • Provides a focus and purpose for alienated low level literacy students • Provides learning beyond the text-book for teachers • Students love collaborating and choose what they want to learn (not what they are told to learn) • Development of global skills • Decreased ethnocentricity • Builds empathy for others • Student autonomy

Stella's objectives to connect were supported by technology infrastructure in the school which had improved in recent years through government initiatives and new network speeds. For Australia, being in the Asian area and distant from most of the world, time zone barriers are an issue. Other barriers included different cultures, school holidays and schedules, confidence in using technology, educator mindsets, and learner confidence in communicating across languages. Barriers to prioritising global collaboration within the school included the focus on data collection, on literacy and numeracy, a crowded curriculum, and time-poor teachers.

Development of multiple communication strategies to build empathy with partners overcame many of the cultural and language barriers inherent in online

global collaboration. Referring to students confidence, Stella observed how those with low literacy skills were often the one's coming in at lunchtime to be part of real time online collaborations. During live sessions (Skype or video conference) Stella's students learn to mime, provide signage of simple words like 'please repeat' or images of Australian animals, listen for responses, and modify their behaviour based on these responses. Stella also uses tools like Skype translator, a tool she believed every teacher should learn how to use. Working with objects required what Stella called "speech craft", that is, speaking clearly, pausing, waiting, and using body language to support what is being said. Stella commented how asking questions of others through a live session or via a social network was a key piece to the global collaboration. In conjunction with global skills enabling life in a global society, Stella's students developed empathy for communicating with others while online. Stella described:

> They now understand a lot more about the people who live in other countries, their religions, how their life looks. The students in my class, because of their isolation tend to be biased and I think they become a lot more tolerant and develop empathy for other cultures etc. and that's so important. We want to live in a peaceful world altogether.

Inquiry-based learning, including curiosity about lives and situations, provided deeper knowledge of the Australian culture and country and built confidence as students shared their lifestyles with others online. Stella reflected, "I think when we collaborate globally we learn just as much about those other people as we do about ourselves and I think our own personal sense of being an Australian is terribly important as well".

Online global collaboration was not prioritised at Stella's school although about three or four teachers out of 22 were currently implementing it. The Principal was keen to see these collaborations occur naturally in the classroom when the right topics arose. Stella believed time was a critical factor in this: and teachers were generally time-poor. As a mentor to others, Stella answers questions and provides resources for global projects. She considered involvement in collaboration was the key: encouraging, supporting, and sharing, and that no project or idea is too small. Stella described:

One of the primary school teachers worked with a school in Israel and sent each other toy animals that represented our countries. The Israeli alphabet is so different to ours; you know they shared flags, all sorts of things. Simple projects like sharing photos or just sharing toys and keeping a diary of what's happening can be really good too. We connected with a school in America; we learnt they were studying animals in Australia so our kids sketched the animals. Little Prep 1's sketched our animals and showed what their creative ideas were compared with the textbook pictures and then the music teacher from the primary school taught them a song.

In terms of technology access, Stella's secondary school had a BYO device program, and she utilised a large monitor in the classroom for projection, as well as a camera and a microphone. As she said, "Well that's just about it really, very simple technology that can still do some amazing things". Students had started to initiate Skype calls with others in the world, e.g., a recent connection with Finland moved from email to Skype communication. Although Facebook was blocked in the school, at the Principal's request, very little else was. Technicians unblocked sites needed by teachers on request. Primary School classes had an interactive whiteboard, camera, microphone, and access to the computer lab 2-3 times per week. They also had iPads and Netbooks to share therefore, although not 1:1 access, students did have regular opportunities to use digital tools for connecting and creating.

Stella is a great advocate of blogging and encourages students at all appropriate levels to do so. She believes students work should be visible to the world: blogging, receiving and replying to comments, interacting via Twitter, collecting data from the world and sharing back. The immediacy and authenticity of global connections for learning is evident by Stella's description:

I think there's no point in blogging if you just write it and keep it to yourself. The kids have all got little cluster maps that document or put little dots on when people around the world visit and they love to come in and look at where they are getting the dots from. A lot of people don't leave comments but some do and then my students always comment back to them and hopefully a conversation occurs. We were studying and doing spreadsheets and charting and I thought the weather would be a good one for the students to graph. On Twitter I asked people to share what the weather was like and we got about 20 replies within 15 minutes so the students straight away were able to set up a spreadsheet with that information.

5.4.1.3.2 Approaches and beliefs to do with online global collaboration.

Much of the conversation with Stella centred on her classroom practices. The following section shares her beliefs and approaches to teaching and learning that support this practice.

Stella's approach to technology is shaped by her early experiences in the classroom teaching computers. When using technology Stella believes it is important teachers understand they are no longer the experts, they learn along with the students, take risks together, experiment, laugh at things that go wrong, use mobile technologies and apps (such as WeChat), while making and sustaining important connections. This supports the immediacy of learning or what Stella calls, "learning right now". Students do not want to wait days for an answer, and mobile apps provide that immediacy to connect with others. Stella related:

> One of my students had to get finished in the China Connections project, and she was trying to find out what pets people in rural areas had in China. So we got onto WeChat on my phone and within minutes we got some responses back by people in that group and she also got photos back, so we got photos of like, snails because that was one of the people's girls' pets. And then you talk about why do they have snails, because they don't have space, you know outdoor settings that they can keep their pets in.

Stella laughed when she was asked about professional learning to prepare for online global collaboration. Her approach has always to learn alongside the people she collaborated with with a hands-on approach. In addition, she articulated:

> I do think that the Global Education Conference is an amazing conference and I learn a lot about global collaboration there still. Sometimes you think you know so much and then you realise there is so little that we know. I think that I actively use Skype in the classroom website and meet a lot of people through that. I Twitter, I follow some of the global hashtags, get involved in Twitter chats. Just getting involved in global projects and being a mentor for different groups like Google groups or whatever and being involved with the ISTE Global PLN all of that, and it's very much organic learning I think that has helped me you know.

According to Stella, when completing an online global collaboration there needs to be conversations between educators leading to a shared reflection and understanding of the collaboration focus and goals.

Stella fosters a sense of wonder about the world and expects students to interact and learn from others. She combines synchronous and asynchronous communication, global collaboration and an inquiry-based approach to learning. Stella thought her approach to teaching and learning had changed through becoming more organic and accessing people and resources beyond the traditional textbook approach in schools. She shared that through online global collaboration students learned a lot more about things they want to know about, not what they were told they needed to learn. For example, Mandarin Chinese students in Stella's school connected with China and had chat sessions about lifestyles. She believes it is possible to align curriculum objectives with planned online activities and teachers should have more flexible curriculum guidelines. "So many people out there can actually bring textbook learning to life for you. I think just be flexible, get yourself networked as networked learning is huge". Stella believes that through online global collaboration students are autonomous and more collaborative. They are more confident working in groups in the classroom and globally, "[i]f they've got a network themselves, they can ask their network questions in order to be able to do whatever they need to do within the classroom as well".

When asked about teaching collaboration skills in order to be effective global collaborators, Stella shared she thought collaboration skills are vital when working asynchronously: it is about making sure students are persistent - evoking responses from others, being active and contributory themselves, keeping communication happening, staying on task, and keeping conversations going. She sees the teacher role as mentor to foster different ways of communicating and connecting leading to better collaborative skills.

5.4.1.3.3 Pedagogy, curriculum and school culture.
Stella was very quick to confirm her belief that global collaboration is both pedagogy and a curriculum:

> I think the pedagogy is there and I think the curriculum now needs to be developed and I think if we do develop a curriculum then that will help support all those teachers who would love to have a go and are perhaps not quite certain how to go about it and you know, the wonderful outcomes that can come from it.

Stella lamented how much time was spent focusing on testing and sticking to a set curriculum. She hears what people were telling her: that the curriculum is too crowded with no room for anything else. However, she is resolute that global collaboration adds so much more value, and qualifies this by saying the collaborations do not have to be long-term. Simple connections and ongoing Twitter conversations have impact as well: some teachers in her school shared what students were doing through Twitter accounts. According to Stella the school culture does have to change so that technology is made available to teachers, such as reviewing blocked websites, making sure all teachers have devices and access to the technology because, "If the teacher's got the access, the class does". Stella's final message:

> I think people need to be made aware of the true value of it all, how it can support what they are doing in the classroom. People need to be made aware of what they can do synchronously, asynchronously, simple things they can do together. They need to understand how to network and how to learn from their network, how to share with them how to add value to it and somehow they need to be able to connect with others.

5.4.2 Global Collaborator #6: Jill - 'Visionary Stalwart'.

When Jill accepted the national ICT Teacher of the year award about 10 years ago, her acceptance speech stated, "I'm no better than anyone else sitting in this conference, all I do is I am enthusiastic and I share what I do. Anyone out there could be doing that too. I don't put myself up as a guru." Despite claiming to be no different to others, Jill seems to always go above and beyond. The interview we did one morning was no exception as she laughingly informed me of her previous late night writing copious notes to share ideas with me.

5.4.2.1 Profile of Jill.

When this research took place, Jill was a leading ICT educator coming to the end of her full time working life. She had been teaching for 35+ years as a Primary school teacher in both rural and urban areas, private, catholic and public school systems in Australia. Early on she updated her skills to become a teacher-librarian, and more recently moved from that to ICT teacher and specialist. She is also a pioneer in global projects with vast experience in designing and implementing online global collaborative learning. She has "lived and survived" frustrating school

situations and worked hard to affect change from within and is inclusive and willing to work collaboratively with others for the benefit of the students, to maximise learning outcomes and make learning interesting.

Metaphor - 'Visionary Stalwart'

- **Description**: Designs and implements global projects and connects with others online to support new learning modes
- **Disposition**: Relentless and passionate about the need for change within schools to include global collaborative opportunities; discouraged when others do not share the same vision

Key qualities

- **Learner:** Flexible and adaptive; inquisitive; motivated, always learning, risk taker
- **Professional capacity:** Strives for best practice at all times; willing to mentor others; shares practice
- **Leadership**: Award winning educator; leader within a school for new learning modes; dedicated to the cause
- **Digital competency:** ICT leader; readily trials and adopts new tools; always searching for best collaborative spaces for learning

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It was clear Jill has deep loyalty to learning and teaching, and a vision for what the world could look like if more educators were collaborating globally. About online global collaboration Jill stated:

> They are meaningful words 'flattening the world', realising that we're more similar than different, and we can still satisfy a lot of curriculum objectives as well, it just takes more work to think a little laterally.

Sharing her frustration with the system and with leadership approaches Jill talked about her current Head of School advising her to run with what you have, and 'don't water rocks', when she tried to persuade a year level to take on a global project. She laughed and said:

> I'm thinking that's his message that the teams have to do things together, you can't go off it and do your own thing, so I think he is my biggest one that I'm still trying to get him to move on a bit, and I'm watering a rock.

Jill's quality as an educator and disposition towards visionary determination is shared in Figure 5.12.

Figure 5.12. Profile summary of Jill: 'Visionary Stalwart'

5.4.2.2 Phase 1: Survey responses – Jill.

This section documents some of the initial data Jill shared via the Phase 1: Online survey. The lens of the Taxonomy of Global Connection (Figure 5.13) shares that four out of the five levels are represented as part of Jill's classroom implementation, with Level 5 listed as 'Never'. The project that Jill nominated as being of Taxonomy Level 2, 3, 4 or 5 is called 'Persuasive Writing' (no URL available). This included 200 grade 4-6 students across three schools. Cross-school teams determined topics to work on, communicated using Edmodo, and developed topics into Movies. The Kidlinks Landmarks Project (http://www.kidlink.net/landmark/) is Jill's favourite global project as it is challenging and promotes deep thinking. Jill shared, "I selected year 5 students who would benefit from involvement in this special extension project. We all learnt heaps about interpreting and writing clues, map reading and special landmarks around world."

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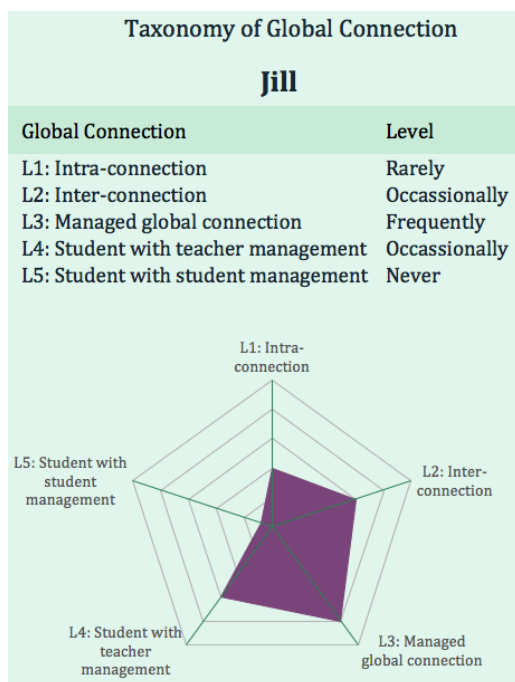
Figure 5.13. Jill's collaboration aligned with the Taxonomy of Global Connection

5.4.2.3 Phase 2: The interview – Jill.

Jill seemed both excited and intimidated to be interviewed. Despite her preparation, she sometimes hesitated when answering. Her deeper understanding and experience in creating online collaborative learning opportunities for students and teachers became obvious as we talked. It was clear Jill had a lot to share to support this research.

Recently Jill's Principal spoke to team leaders, ICT specialists and administrators and commented on the amount of money spent in the last seven years on technology and how he walked around the school "not necessarily seeing a lot happening." He also called in some of Jill's students to find out what they knew using technology: what they did, software use, communication methods and so on. From this he determined that some students were being held back due to lack of teacher knowledge about ICT. Jill laughingly shared that the directive now was for her and other ICT teachers to run additional professional development for classroom teachers, and said:

> Now we only have one double session each a week so we are not going to revolutionise 32 teachers. We are quite a young school with the teaching staff. I thought maybe he brought me in to balance things out [laughs] so it's interesting, one cannot assume younger teachers are more IT proficient than older people, absolutely not, and I think the younger ones are so caught

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up with learning how to teach and doing the maths and the literacy that there's no time, that's what it all comes down to, there's no time.

The outer suburban Melbourne school was not in an affluent area and students came and went a lot, and the internet was unstable. The school was run 'tightly' with a main focus on numeracy and literacy. The opening story shares how almost futile the process is for implementing anything like online global collaboration, for two reasons: teachers lack ICT knowledge; and there is very little time to change this situation. Despite this, Jill has managed to successfully bring ICT classes, with her as the lead teacher, into global projects over the past few years. Table 5.12 reveals current synchronous and asynchronous technologies and how Jill and her students use them.

5.4.2.3.1 Experiences with online global collaboration.

Jill defined online global collaboration as:

> People communicating across schools, districts, states, countries, continents for a common purpose, listening to other ideas, reflecting and responding. So it's communicating with others. I used to think global projects were country to country but someone else suggested that once you're outside of your own school you're actually operating on that level anyway, so anything that takes you beyond your own classroom, out of your own school.

Jill talked a lot more about her background, about how she had made things work in the past and how she continues to be enthusiastic, dedicated, and excited about possibilities. While working as a teacher librarian in past years Jill was motivated to bring online global collaboration to the classroom. She initially did this through the teacher librarian network for Australia (AUSTL), sharing online and encouraging other schools in Australia. The actual collaboration and sharing with colleagues started long before becoming an ICT specialist and the implementation of global projects. For example, Book Week in 2004 the theme was 'Doorways', as Jill related:

> The little series Atashi books have been around a long time, still popular today, so I decided to create a choose your own adventure and I wrote to the publishers to use Atashi as our character and I had 12 different schools around Australia participate where children had to write their own adventure.

Table 5.12

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Jill

	Synchronous technologies	**Asynchronous technologies**
Personal learning	**Google Hangout, Adobe Connect, Fuze, Blackboard Collaborate, YouTube**	**Wiki, Blog, Google docs, Voicethread, Edmodo, Podcasts**
	• Digital Marketing - 4 free webinars (Charles Sturt Uni) to support community activities with non-profit organisation	• Podcasts - subscribes to several ICT podcasts, e.g. R U Connected
Student learning	**None**	**Blog, Google docs, Voicethread, Edmodo, Padlet, Skooville, Storybird, Mathletics, etc.**
	• As the ICT specialist students come for 50 mins a week therefore preference is for technologies that are not synchronous.	• Edmodo - organised a project between schools involving 200 students. • Edmodo to communicate persuasive writing ideas b/w groups.

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.13. For Jill, communication between teachers was imperative to enable online global collaboration in order to establish a clear understanding of the learning objectives, what they were trying to achieve, and to share the collaboration timeline, "Without that structure in place I can't see any project actually getting off the ground and satisfying an objective". Experience in teaching and management in the classroom was an enabler as it allowed for broader learning, although Jill is not sure if this relates more to teacher personality.

The challenge of clear communication was identified by Jill as a major enabler to online global collaboration, as she said, "You can write something or you can speak to someone and you think they know what you're talking about and then you find out well no that's not being interpreted the way I was expecting". The frustration continues when schools that had volunteered to collaborate globally do not email, which translates to teachers not putting the time into communication, while students are trying to join and participate in the project.

Finding common tools to work with that are freely available to all participants was another challenge. Jill shared that the new Office 365 platform in her current school "Will probably be open to our school community and not beyond that because our Principal, like many Principals, are fearful of too much being out there". Another barrier, the "lack of time", was identified as the biggest hurdle due to escalating demands within the teaching role and classroom responsibilities. Coupled with the over-crowded curriculum and moving towards a national curriculum in Australia meant, according to Jill, "Not enough time to address all the things that are already in there so you have to look at what we need to teach and what can we leave out".

Table 5.13

Enablers, Barriers and Outcomes of Online Global Collaboration: Jill

Enablers	Barriers	Outcomes
• Communication between teachers to establish mutual understanding of the collaboration • Project structure - timeline, objectives • Experience in the classroom - ability to move into more advanced pedagogies • Flexible - able to broaden the curriculum as needed • Teacher personality	• Misinterpretation of project goals and objectives • Schools that do not respond, contribute • Inadequate access to online technologies • Closed learning environments e.g. Office 365 • Time is the biggest hurdle for teachers • Fear of the unknown that leads to closed school systems and networks • Over-crowded curriculum - how to make room for global collaboration? • Mixed support from school leaders	• Engagement • Intercultural understanding • Digital literacy skills

Jill told a story of mixed support from school leaders and colleagues across the different schools she had worked in. In her opinion, leadership within schools was not always quick to acknowledge and support innovation or new ways of learning, and at times it became personality dependent. In other words, it was more advantageous for Jill to maintain a friendly rather than confrontational approach with leaders, which she admitted was often hard to do. Another challenge Jill faced as an ICT specialist in her school was being used for classroom teacher time release, something she found very frustrating. Seeing ICT classes as distinct to and removed from the general classroom had not been conducive to developing global collaborative projects or deeper learning tasks in online spaces.

For Jill, the number one outcome of online global collaboration is engagement, seen as the catalyst for real learning that takes place as students communicate with other students online. Intercultural understanding is also important - the excitement of discovering similarities with other kids in other places. Jill laughed out loud about the fact children are excited to find out peers in other countries also like hamburgers (for example), and shared:

> When we were doing the pen pals project, finding out that people in Malaysia like the same music as us, you know it was so amazing, it was just lovely for the kids to discover that there are more similarities between children their age around the world than differences. We might have different coloured skin, we might do things differently but just that basic sharing of stuff, I thought that was pretty powerful, so I do find global projects provide powerful learning, real learning and I think it doesn't matter what you teach.

5.4.2.3.2 Approaches and beliefs related to online global collaboration.

Jill likes to believe that experienced teachers who have a variety of pedagogical skills will "broaden" to include new learning modes such as online global collaboration. She sees that many are happy to do the same thing each year, and muses maybe it is a "personality disposition". Jill is always willing to try new technologies and is empathetic with collaborative learning modes supported by different technologies. Her current school had no iPads but did have computer labs combined with laptop trolleys and, as already stated, the Principal had spent money on technology but not necessarily on professional development for teachers.

"Absolutely not!" was Jill's response to my question as to whether she had control over what technology was purchased and used. She described frustrating situations within the school related to lack of devices in the classroom. She also shared her struggles of trying to move learning into a digital format, her search for tools that would do this efficiently, and frustrations with platforms that did not allow for the sort of continuity and flexibility needed in education. She had started to explore Google apps and attended at least one Google summit (conference) but was frustrated by the "treading water" situation within the school and lack of real leadership for digital learning.

As an enthusiast for new technologies and modes of working, Jill often attends conferences and takes on professional learning. Just prior to this interview she completed the Voicethread Certified Educators training course (https://voicethread.com/). According to Jill, "The best way to move people along is to work with them, with the teachers, with the students so no-one feels threatened and everyone is sort of moving together". Too often though, as a specialist ICT teacher, she was working in a vacuum. She did ask for class planners and tried to extend what the classroom teachers were doing in regular class while in the ICT lesson but teacher inflexibility with curriculum made it hard to negotiate.

Jill thinks there is a great need for teachers to be open in what they are trying to do. In addition, time is the biggest hurdle with demands from within the teaching role and classroom escalating. Jill stated that curriculum flexibility and agility is needed. Referring to the ability and willingness of teachers to change curriculum plans as opportunities arise Jill shared:

> The curriculum, yes we're moving to a national curriculum, but in many ways it is such an overcrowded curriculum there's not enough time to address all the things that are already in there so you have to look at what do we need to teach and what can we leave out?

5.4.2.3.3 Pedagogy, curriculum and school.

Jill thinks global collaboration is definitely both a pedagogy and a curriculum, in an integrated way, although she has no answers as to how to move this forward. She identified a lack of flexibility in curriculum planning, or a lack of knowledge on how to accommodate new ideas into the curriculum. Jill spoke passionately about the need for change within Australian schools where she believes things have become more closed than ever. She cited requirements and situations such as rigid timetabling, assessment practices, data collection, overcrowded curriculum, too much content to cover, and little opportunity to "look beyond the classroom and fly a little". In an enviable position as an IT "class in, class out" teacher (grade levels came to the computer room for IT classes once or twice a week from their regular classroom), she could do what she liked in the IT classroom as long as essential curriculum and assessment objectives were being met. This scenario enabled her to join her IT classes to global projects. However, she maintained working with others in her school on global collaboration would be more ideal, and revealed that:

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I would love to work with other people and get some other people involved too to get that sense of awe, wow we are communicating across the world, this is real learning, not ticking the box or reading something else that is unrelated to anything in their lives, it's frustrating.

5.5 Global Collaborative Educators Who Are Specialists

This third group of educators were full time specialists within the school. One, Claire, is a librarian with a focus on technology; the other, Angela, is an ICT specialist focused on years 5-8.

5.5.1 Global Collaborator #7: Angela – 'Connector'.

Angela has been part of global projects since the 1990s. At that time, her first contribution to an online collaborative system was a peace project related to UNESCO. Of the early days she shared:

I've been teaching with computers in classrooms probably since 1995 when I had my first computer in a classroom and the children weren't allowed to touch it because I didn't know how to work it, (laugh) until the children told me they actually knew what they were doing and I didn't, so my seven year-olds taught me how to use a computer. And I really have taken that pathway of learning ever since.

5.5.1.1 Profile of Angela.

Angela has a diverse background as a primary year's teacher for 5-10 year olds, a computer teacher at the university level, and a multitude of bilingual and English as a Second Language teaching. At the time of the interview she was the ICT specialist and technology facilitator at a small independent inner-city school in New Zealand. With around 300 students at K-8 levels the school had a diverse ethnic mix of staff and students. The profile of Angela as 'Connector' is found in Figure 5.14 below.

Metaphor - 'Connector'
Description: Works hard at connecting educators and students online within and beyond the school to make the 'shift' happen   **Disposition:** You can learn something from everyone, especially students. Flatten the learning environment to maximise potential; collaboration changes the teaching paradigm   *Key qualities*   **Learner**: Has a good mindset to work with online global collaboration; can use technologies to support this goal; excited by experiences that 'open' the classroom walls   **Professional capacity**: Confident; finds a balance between the social, the learning and the social learning; understands pedagogy and curriculum alternatives   **Leadership**: Advocates responsible approaches to online learning; pushes teachers to have a go; organises online connected sessions called 'TeachMeets'   **Digital competency**: Intuitively capable with digital technologies; supports online learning with other teachers and students

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Angela	50-59	Independent	Urban, New Zealand	Tech facilitator K-8	30+ years

Figure 5.14. Profile summary of Angela: 'Connector'

5.5.1.2 Phase 1: Survey responses – Angela.

This section documents some of the initial data Angela shared via the Phase 1: Online survey. Although seemingly less experienced with global connections, as shown by responses to the Taxonomy of Global Connections levels in Figure 5.15, Angela has worked consistently worked to bring new opportunities to her school through a connected approach and determination to collaborate globally. The project Angela nominated as being of Taxonomy Level 2, 3, 4 or 5 that ran for six weeks or more was called 'A Week in the Life' (for example, https://friendsforsustain.weebly.com/awl-14-2.html). Interestingly Angela cited a professional learning experience with Flat Connections Global Certification as her favourite online global collaboration. As she said, "I learnt so much about curriculum design. I enjoyed working with likeminded educators who were just as enthusiastic as me".
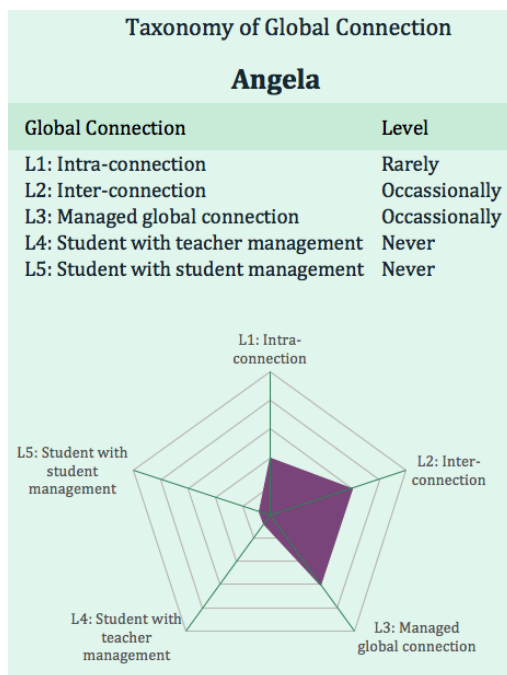
Figure 5.15. Angela's collaboration aligned with the Taxonomy of Global Connection

5.5.1.3 Phase 2: The interview – Angela.

As a technology facilitator Angela worked across all levels of K-8 supporting educators in the classroom. Her school used Chrome books and in the upper classes, there was a one-to-one device ratio. However, Angela emphasised that it is not all about students having personal devices, it's about having something that can connect

to the internet such as a desktop, a cell phone, an iPad, and children working together to create their own learning.

5.5.1.3.1 Experiences with online global collaboration.

Angela defined online global collaboration as being "across the borders" by crossing the continent, the ocean and time zones, and even across languages. She also talked about co-creating and co-constructing an artefact or some kind of shared learning that is visible, with both teachers and students reflecting on the process. In her classroom, learning is connected through being face-to-face, and then digital learning starts with students being responsible both online and for their learning. Table 5.14 revealed current synchronous and asynchronous technologies used by Angela and her students.

Table 5.14

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Angela

	Synchronous technologies	Asynchronous technologies
Personal learning	Skype, Google Hangout, Adobe Connect, Fuze, Blackboard Collaborate	Wiki, Blog, Google docs, Voicethread, Edmodo, Padlet, Titanpad, Google+ community
	• Joins and initiates TeachMeets and other virtual online gatherings	• e-Book creation through educator collaboration. • Visible collaboration using different tools and community platforms
Student learning	Skype, Fuze	Wiki, Blog, Google docs, Voicethread, Edmodo, Padlet
	• Cross-curricular inquiry projects connecting with authors in real time	• Expectations that students will connect and communicate using diverse tools

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.15. Angela cited teacher mindset as a major enabler to online global collaboration and shared how important it was to have a certain mindset to support active involvement. This was something she stated she has, but many others did not have. She shared her frustrations with teachers not using technology in the classroom and how she felt like taking the technology away from them. A positive example in her school was when one grade

level joined a global project encouraging teacher and student active involvement with other global classrooms. Angela commented on the change in the classroom, "Something definitely happened, you can just see that shift changing and that's what I want to see more of".

Table 5.15

Enablers, Barriers and Outcomes of Online Global Collaboration: Angela

Enablers	Barriers	Outcomes
• Teacher mindset • Strong school Principal who understands digital learning • Activated system ready for collaboration • Teachers provided with technology • School encourages and is generous with PD • Open learning - Very little blocked online	• Teacher perceived lack of time or unwillingness to put the time into global collaboration • Not willing to share formative or 'unfinished' work	• Motivated and energised students • Ready to read, write, construct in preparation for working with others around the world • Student autonomy in learning • Teachers want more technology in their classrooms

Another enabler was a technology-strong and supportive principal who understood digital learning and supported new ideas and activities. Angela laughs that she is now at the stage where there is great trust and she can say to the principal, "We're doing this, sign the cheque" and reflected, "that really helps when we need that signed cheque". The school also enabled teachers through providing iPhones and iPads, in addition to the government provided laptops. Professional learning was encouraged and the school was generous in providing it.

Time or perceived lack of it by teachers was considered a major barrier. Angela said she just puts in the time and makes things happen - and does not fully understand why other teachers did not readily do this. Angela stated, "Online global collaboration needs to be part of the learning, not on top of the learning".

Angela spoke positively about the benefits of online global collaboration in the classroom and that students were much more motivated, energised and ready to read, to write, and to construct in preparation for working with others around the world. They were also more autonomous in their learning within the classroom and, to a growing extent, beyond the classroom. One outcome of working more online and

connecting globally was that teachers were already in the mindset of using the technology to support learning and wanted more technology in their classroom including more communication apps. Angela is always cautious and asks teachers to show what they can do with what they have already before asking for more.

5.5.1.3.2 Approaches and beliefs to do with online global collaboration.

Angela's school faced many challenges around motivating and guiding teachers into new modes for learning using online technologies. Although there was no BYOD program, older students had 1:1 devices provided by the school, and this program was planned for roll out to the next couple of grade levels. The school also had unlimited Internet access via fibre optic connection. Angela had autonomy within and beyond the school to block or unblock internet sites. Rather than applying multiple filters, the approach in the classroom was to work alongside the children, deal with incidents as they happened, document and learn from it.

Angela works with many classes and teachers in the school and believes that if she can "get teachers moving" things will happen in the classroom. In her view, the challenge was that she personally is confident working with students to implement online collaboration but when she is not there "everything stops" as teachers were not as fully invested or lacked the confidence to continue. She pushes the classroom teachers, is their biggest supporter, and works hard to build their confidence and independence with new technologies and pedagogies. She also believes in the power of online learning to promote minority voices, or voices that you do not often hear online, especially being a speaker of minority languages. Finding a balance between the social and the learning and the social learning is important to Angela. She likes to let children know that teachers will be there in online spaces with them, supporting and monitoring, and keeping their conversations on track.

According to Angela, completing the Flat Connections Global Educator online course (http://www.flatconnections.com/global-educators/) was a catalyst for further global collaborative work, as was having the opportunity to pilot a global project with one class in the school. Angela's position as the global collaboration expert within the school provides a mentor for other teachers. She proffered that being able

to learn on the go is important and that over the past year teachers had been trialling and implementing 1-to-1 devices, which has been a journey in itself. They also had to learn how to work more collaboratively as a team and open their planning and use online technologies for transparency. Working online as a team is an advantage for teacher professional growth and Angela's school does team planning online now devoid of paper. Online accessibility of planning documents has helped to support collaborative learning objectives for students, especially when joining online global projects as the timeline and events were easily traceable through a shared staff calendar and this made it easier for Angela to monitor and support her teachers.

Being well equipped and having many professional learning opportunities Angela regarded her school as further ahead than others, and she therefore often brings in outside experts to customise PD for technology integration. An enabler for teachers is having external expertise from someone who was also a classroom teacher and understands the immediate practical implications. Working alongside teachers and preparing them for online collaboration Angela has seen classrooms "open their walls" with a blog and they were excited that big things are happening. "And when the teachers get together and work together and then co-create something, something awesome happens but it's still not enough, it's still not enough". Angela's goal is to have online collaboration taking place across the school and not just between schools in New Zealand, but globally.

As an active global educator recent experiences have given Angela the courage and confidence to experiment more and not be afraid of failing. Through her work with SOLO taxonomy (Biggs, n.d.) she realised a lot of it was low level and that online global collaboration was more advanced and "extended abstract thinking". She shared, "I knew that that's where I was heading and where I wanted to be and I could see what it was I needed to put in place". Angela advocated sharing learning beyond the classroom and runs online 'TeachMeet' sessions for others to do this. She commented that educators often want things to be perfect before they share, but in reality, it is about the process, "So there is never a perfect product or a perfect reflection because there is always something else to do".

It was through discussion around online TeachMeets that Angela lit up and talked excitedly about learning that goes beyond just the use of tools. She recognised:

> I'm really much about the tool and I've got to be cautious of that. Any new gadget that comes out I get all excited but I've got to also think about what you can't see - it's about the relationship building between people, it's about making the connections stronger and so that's basically what TeachMeet is. It brings teachers together to help them make connections.

In many respects, Angela is the bridge between online global collaboration and her school community. She shared how educators are online and social media plays a role in the school: they have a Twitter account and activity is increasing; they are all on Facebook, especially the New Zealand primary teacher group, although some may be lurking and not actively involved. The head of the school is very active online and leads by example. Angela supports classroom activities by crafting tweets tweeting while the head of school 'like's' and 'retweet's'. This is viewed positively by educators as appreciation for, as well as understanding and support of, their work. Recently a class participated in a global student summit and the head teacher came in virtually, engaging the teachers and students. Despite this, activities such as Facebook are still national and have not ventured into global conversations, however Angela shared, "So I've really dragged them, thrown them in the deep end and they've done it". Again, Angela referred to the mindset and in addition, the skillset, emerging in the school is one of "I can do anything". She believes that even if you 'fail' you can still do it and have a go and that this mindset is something you cannot train for as such, it is more experiential.

By working with teachers to support online learning, Angela has found they come on board and start to implement global collaborative practices. Previously, when she was the technology teacher coming in to work with students on global projects, the classroom was not engaged but she now claims that by involving teachers, something has happened.

5.5.1.3.3 Pedagogy, curriculum and school culture.

Angela paused when asked the question about global collaboration and whether it was a pedagogy or a curriculum, and then stated she thought it was both, as well as

a mindset. Angela likes to put the 'global' into collaboration by encouraging teachers to make connections beyond their own country. She sees visibility in learning via global connections as essential. She stated:

> You think you're doing great stuff when you talk to somebody in China, you think you're doing amazing stuff but if I can't see something that you've made together you might just have written a letter or sent an email. If you've co-created a video with kids in China and kids in Singapore, you know, or you've created something, something happens.

In Angela's school, with the 76% Asian population and most students being bilingual, it's a given, according to Angela, that school culture must value international interactions and collaborations. She stated, "We are growing the next generation of peacemakers and if we can get them talking, sharing, and learning about each other maybe we won't have some of the big hassles that we've got going on at the moment". Her school has added global connections into the strategic plan and they now have to do it, not just talk about it.

5.5.2 Global Collaborator #8: Claire - 'Mentor'.

Claire is outwardly enthusiastic about online global collaboration and speaks with authority about what is and should be taking place in schools.

5.5.2.1 Profile of Claire.

Based in the USA, Claire had been teaching for less than 10 years at the time of the interview, during which time she also completed a one-year technology coordinator position in China at an international school, K-5 levels. This gave her much coveted global experience. She has taught high school computers, and has been in the role of technology coordinator and librarian across all K-12 levels, and has International Baccalaureate (IB) Primary Years Programme (PYP) experience. At the time of the interview, she was in the position of Library Technology Educator for Grade 9-12 at a boarding school in the USA. Claire's ability to coach, support and mentor others has earned her the metaphor of 'mentor', as described in the next section. About online global collaboration Claire shared, "Students can be those primary sources for each other and you can learn a lot from each other through that". Figure 5.16 shares the 'Mentor' descriptors in more detail.

Metaphor: 'Mentor'

- **Description**: Works confidently with educators to share knowledge and build skills; advises administrators and colleagues about online global learning
- **Disposition:** Believes in the power of successful global collaboration and that everyone can learn how to do it

Key qualities

- **Learner:** Willing and able to take on new challenges; inquiry-based and skills-based
- **Professional capacity:** Values her PLN; confident connecting and learning online
- **Leadership**: Builds professional learning communities; manages online global projects
- **Digital competency:** Technology facilitator; digitally confident in multi-modal environments

Pseudonym	Age	School Type	Location	Grade levels/ Subject area	Length of time teaching
Claire	40-49	Independent	Urban, USA	Library-Technology specialist	6-10 years
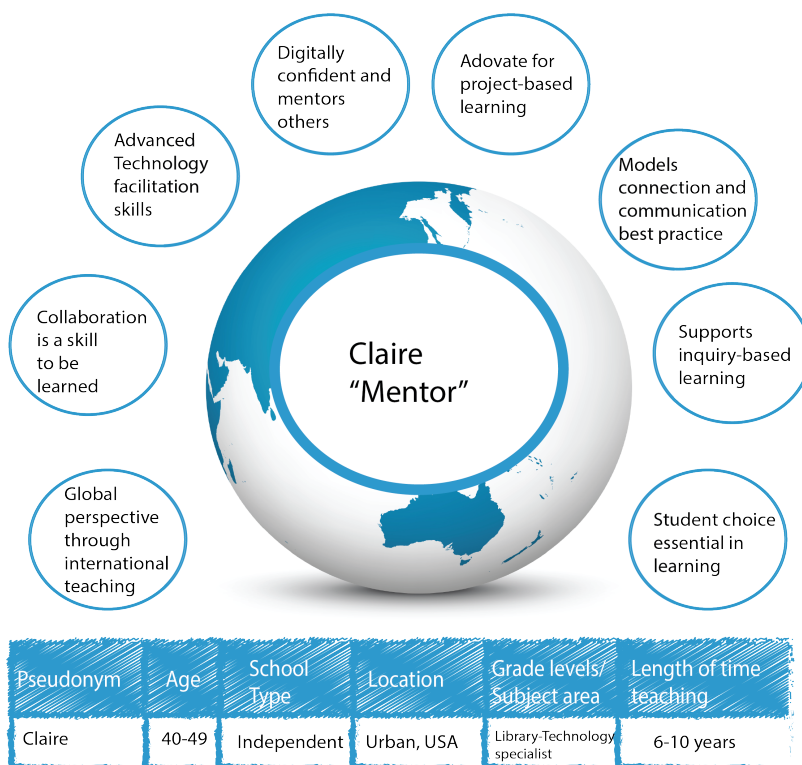
Figure 5.16. Profile summary of Claire: 'Mentor'

5.5.2.2 Phase 1: Survey responses – Claire.

This section documents some of the initial data Claire shared via the Phase 1: Online survey. Through the lens of the Taxonomy of Global Connection Claire revealed her approach was more 'occasional' when initiating or joining levels 2, 3 and 4, and had 'never' joined or initiated a level 5 connection (Figure 5.17). There were two six-week or more online global collaborations of Level 2, 3, 4 that Claire had participated in previously. These are the 'A Week in the Life' project from Flat Connections (http://www.flatconnections.com/) and various projects through connections made via a collaborative network called 'Our Global Friendships' (http://ourglobalfriendships.wikispaces.com/). Claire stated that Flat Connections was a favourite global collaboration project because it is where she started and met many like-minded teachers.
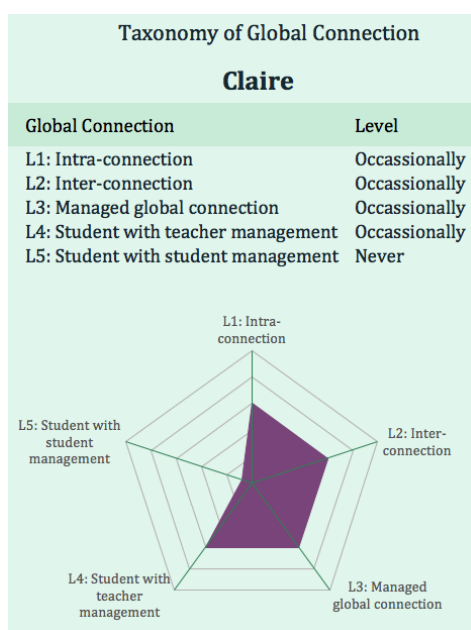
Figure 5.17. Claire's collaboration aligned with the Taxonomy of Global Connection

5.5.2.3 Phase 2: The interview – Claire.

During the interview, Claire shared a unique perspective and experience from elementary through to high school teaching positions. Her work in IB schools informed how a focus of 'international mindedness' can be supported by the administration and understood by the teachers. Claire's current school lacked of priority for online global collaboration and focussed on 'College preparation'. Therefore, although the school knows she has skills in this area, because of the way

the school is set up, or has been working in the past few years, they are not taking advantage of any new approaches to global education that she could facilitate.

5.5.2.3.1 Experiences with online global collaboration.

Claire has had success with all grade levels for online global collaboration including students as young as Grade 2, upper elementary classes, and high school. She described online global collaboration in the classroom as a process and when she leads or facilitates classes, common first steps for communication include social activities using tools like Edmodo or Ning. This then moves into creating artefacts using tools like Voicethread, Google Slides or Wikispaces. She views synchronous activities, like teacher meetings, as important for teachers so they can discuss global project goals and methods, address issues and solve any problems during the collaboration. For students, Claire stated that in her experience asynchronous communication is the norm for global collaboration due to time zone issues and difficulties getting participants together, however synchronous meetings like Student Summits do generate excitement and engagement. Table 5.16 reveals current synchronous and asynchronous technologies and how Claire and her students use them.

Table 5.16

Evidence of Synchronous and Asynchronous Learning for Personal and Student Use: Claire

	Synchronous technologies	Asynchronous technologies
Personal learning	Skype, Google Hangout, Adobe Connect, Fuze, Blackboard Collaborate	Wiki, Blog, Google docs, Edmodo, Padlet
	• Skype Groups to connect with others and find out how they are using technology.	• Wikis to connect with other teachers and assist them in posting information about their global projects.
Student learning	Skype	Wiki, Blog, Voicethread, Edmodo
	• Skype to play Mystery Location and connect with schools when working on projects together.	• Wikis - putting artefacts from the project in one place. • Edmodo - communication tool for connecting students and discussing a project.

Enablers, barriers and learning outcomes

Specific enablers, barriers and learning outcomes from online global collaboration are shared here, and summarised in Table 5.17. According to Claire, enablers include Web 2.0 tools used to support both synchronous and asynchronous objectives making the communication and collaboration process more streamlined and faster than in the past. As she indicated:

> We might be in school and the other kids might be at home and you can hop on Edmodo at the same time or you can be in Voicethread at the same time working on things. That has made it I think a lot faster to have the process not be as slow as it had been 20 years ago. [when email was the main form of communication].

Table 5.17

Enablers, Barriers and Outcomes of Online Global Collaboration: Claire

Enablers	Barriers	Outcomes
• Web 2.0 tools that allow for access and socialisation beyond the classroom • Supportive administration • Focus on project-based learning and design thinking • Focus on critical thinking beyond the textbook • Having a teacher mentor who understands global collaborative learning • Consistent adoption across the same grade level or discipline area	• For US teachers time is the biggest barrier because of state standards and testing • Finding another teacher with the same passion and commitment • Conflicting curriculum needs make collaboration a low priority • Lack of common learning goals and objectives • As a librarian, not having a class to put into global projects	• Create a collaborative wiki site or slideshow • Professional development for teachers • Teachers build a PLN • Students break down cultural barriers - reduces ethnocentricity • Gain a global perspective through experiential learning • Students do better work when they know it is visible to the world or to peers

Another enabler is having a mentor, a role Claire takes on in the school, to discuss curriculum needs and find suitable global collaborations, or start a new project that aligns with the class needs. A supportive administration, a focus on project-based learning and design thinking and a focus on critical thinking beyond the textbook also enabled online global collaborative learning. Claire shared that one semester she had a whole grade level, third grade, in the same global project, making it "really easy" to manage and support because all teachers had the same goal.

One of the main barriers to online global collaboration was lack of time, and educators in the United States continued to have state standards and regular testing. However, Claire stated that if a teacher found the time the biggest barrier was then

finding like-minded colleagues with the same passion and commitment, and same timeframe for implementation. Embarking on a global collaborative project is a big commitment, and often educators say 'yes' but then their priorities change. This also happens when educators bring in personal goals and cannot adapt these to the goals of the collaboration. Other disconnects occur when partnerships are not equal in time availability, for example if one class in the collaboration can spend 3-4 lessons a week, while another can only allocate one lesson to the collaborative work. Teaching from different curriculum bases was also problematic, as a great collaboration has to have common goals, therefore as Claire noted:

> A lot of the projects I'm in people just kind of fall out of and don't finish because it's not their priority or part of their true curriculum. I think some people do not take the commitment as a priority and so they have their other curriculum that they are doing.

Another barrier Claire encountered, being in the library and/or as a technology facilitator, was not having her own classes to bring into collaborative projects:

> I'm in a position where I don't have classes which is great because I can reach more of our teachers, but it's harder to get the teachers to commit to the collaboration, even knowing that I can be there during the class time and I can get them started and I can take over the class if they needed me to for learning blogs or wikis or Edmodo or whatever they need.

Claire stressed one of the most important outcomes of online global collaboration is professional development for the teachers while collaborating. As she shared:

> There are always people who do things differently who have great ideas to share with you and most of the people who want to do this kind of thing are big sharers and they want to learn from you and they want to teach you what they know. I also think that teachers need to want to be connectors in order to want to get their students to connect, so that is a big one.

For the students, Claire related important outcomes as breaking down cultural barriers, and developing digital citizenship skills while learning more about the technologies used to connect, collaborate and create new online spaces. As she explained:

> The phrase is 'flattening the world'. I think they [students] really can try to break down the cultural barriers in our world right now that cause a lot of the conflict that we see all the time. For them to be able to say 'I'm talking to a student in Egypt'…realise they are people just like they are and yes

there are some differences but there is a lot that is just the same such as how they are growing up. Seeing those similarities and differences I think really helps them open their minds to other cultures.

5.5.2.3.2 Approaches and beliefs to do with online global collaboration.

Claire was working on showing her school the project-based learning and design thinking aspects applicable to high school levels. This included what she sees as learning for critical thinking that will provide students with an understanding of the world. She defined online global collaboration more than just teachers and students connecting together on a project. She prefers to see something created from the collaboration, as she says, "I think the collaboration has to be about the creation of something new that you're doing together".

When Claire worked in China she enjoyed having one laptop lab per grade level for consistent access, however her experience in that country also involved many blocked websites and limited access online. When she worked in a public school in the USA, although there were limited resources, she worked with the technology department to make sure digital technologies were available online. She finally got a laptop cart for the library, making access easier as well. At her current school there is a loose 'BYO device' policy and students comply, but as she advised, "I'm at a school that doesn't do a lot of tech integration so we're working on getting those teachers up to speed on how to use those things". In terms of blocked websites, Claire was quite reflective, but firm, the educators must have the flexibility to unblock educational sites as needed. Claire believes it is important to have student work visible to the world as it encourages students to do better because they know their peers are looking at the work. She acknowledges that discussion must take place about security and privacy and if parents continue to have any concerns the online name of the student can be changed - something she has done in the past.

Claire considered doing global collaboration a part of professional learning and cited examples where online work with colleagues resulted in co-presenting at conferences. To do this they plan using email initially and Google Slides to be able to create something they all agree on and are able to present together. She also shared that the Flat Connections online course also helped her understand

collaborative learning and working with others at a distance. Her comments about knowing how to work online as educators also included utilising asynchronous communication and online synchronous teacher meetings to share understandings of global project goals and outcomes, including timeline and required participation, in order to ensure success.

Claire preferred an inquiry-based approach to teaching, rather than always providing the knowledge for students, they retain it better if it's found independent of the teacher. Her approach to teaching has changed due to the impact of digital technologies. Students can now find their own information online - the teacher is less responsible for accessing this but should be responsible for how students inquire and learn online. In terms of global collaboration, other classrooms and students themselves become the primary source of information, so instead of reading it from a book, learners connect and learn together. By working with global collaboration, Claire feels she now gives students more choice because she can see students want the autonomy of learning it gives them. In addition, global collaboration needs to be purposeful and in her experience some students still work better alone than in groups.

Claire sees teacher communication, attitude, flexibility and student choice as key attributes for global collaboration, and this includes giving students choice of topic, direction, learning partners etc. This often conflicts with what the teacher sees as necessary for learning. Educators need to model reliable and responsible global connection and communication so that students understand what is expected of them as they collaborate with partners.

5.5.2.3.3 Pedagogy, curriculum and school culture.

Most of the global collaborations Claire has participated in have influenced her pedagogy and curriculum, "You're changing the way teachers are really teaching and students are really learning by how you're doing your global project and project based learning". Referring further to PBL Claire is an advocate for more of this in schools and less content based learning that includes testing. In terms of learning content versus learning skills Claire stated:

What are the skills we need to leave with? If we're talking about skills, global collaboration [such as a global project] has so many of those 21st century skills embedded right into it that allow them to practice outside of their classroom with many different students and teachers participating.

5.6 Emerging Themes and Ideas

The semi-structured interviews with online global collaborative educators were based around the three main research questions to do with educator experiences, educator beliefs and educator pedagogical approaches. Data from these were organised using the 'Coding Playbook', (see Appendix 3). Some emerging themes and ideas around each of these key areas of investigation are detailed in Figure 5.18. These are presented in such a way as to 'reveal' initial analysis of factors that have allowed, supported and inspired educators to implement online global collaboration. They are offered as a bridge into Chapter 6 where more detailed analysis of interview data responses is presented.

5.6.1 Experiences.

Participants experienced isolation within their school, to the extent that in more than one instance they self-labelled as 'outliers'. Online global collaboration is still very new in schools and it is becoming clear there is not the infrastructure, understanding and commitment to implement it in meaningful ways. Despite a less than ideal school situation for implementation these educators were able to take advantage of enablers and overcome initial barriers to forge ahead.

Pertinent to all experiences was the disposition to connect and learn from a global network. Pedagogical isolation within the school led to an increased motivation by all educators to network globally in order to share ideas and create viable collaborations. Curriculum flexibility and agility, although once again not as readily accessible in some schools as individuals may have liked, provided a further bridge to online collaborative success.

5.6.2 Beliefs.

Some participants mentioned teacher personality and mindset, and throughout the eight interviews it became clear that everyone had a certain positive disposition towards trying new things in the classroom. This mindset enabled a unique skillset where educators confidently and capably used digital and technologies in the classroom to support online global activities. Strong beliefs emerged about the positive value of connected learning and sharing via online spaces, as well as online learning and online global collaborative learning. These participants had personally experienced the advantages and positive impact on themselves as well their students and 'believed' whole-heartedly in the value of learning online globally with others.

Figure 5.18: Some emerging themes and ideas from educator interviews

5.6.3 Pedagogies.

The participants revealed pedagogical approaches that include connected and collaborative learning while online. In many examples flexible curriculum design, and access to digital technologies allowed them to adopt new approaches to online learning. This included both synchronous and asynchronous modes and much was shared around these modes to support learning beyond the classroom.

5.7 Summary

This chapter shared details of the eight educators interviewed for Phase 2 of the research. From these interviews, in conjunction with data from responses to the Phase 1 online survey, an individual and unique profile was developed for each participant. To segment the large amount of data and attempt to personalise, visual metaphors were applied and tables constructed showing pertinent technology use, as well as enablers, barriers and outcomes of online global collaboration, as described by each participant. Through my interpretation of the data individual voices are represented as descriptive and analytical narratives interspersed with pertinent quotes. The participants are a unique group from diverse geographical locations representing classroom teachers and specialists from both government and independent school systems spanning early years to high school education levels. They collectively revealed their passion for online global collaboration and described individual approaches to implementation within their learning environment. Chapter 6 presents further findings and analysis of the data.

CHAPTER 6 – FINDINGS AND DISCUSSION

6.1 Introduction

This study investigated evidence of online global collaboration in the K-12 classroom in respect to educator practices, beliefs, and enabling pedagogies. Previously, in Chapter 4 participants in both the Phase 1: Online survey and Phase 2: Semi-structured interviews were profiled. This included presenting survey results from 65 responses and detailing the process for selecting and inviting a smaller number of educators to be interviewed for Phase 2. The criteria for Phase 2 selection included acknowledgement by the educators surveyed of implementing an online global project of at least six weeks in length thereby indicating participant readiness and capability in online global collaborative learning.

Chapter 5 presented the Phase 1 survey and Phase 2 interview data collected from the eight interviewed online global collaborative educators in a narrative and visual format. The findings acknowledged what learning and teaching can become told through the interviewee's individual experiences. Chapter 6 now shares findings through thematic analyses and synthesis of interviewee responses to the three focus research questions. Interview data reveals positive outcomes, associated barriers and enablers, beliefs and pedagogical approaches when online global collaborative learning takes place. Stemming from these findings are new understandings presented as the Global Collaborator Mindset (GCM) and the Online Global Collaborative Learning (OGCL) construct.

Reaching a common definition of online global collaboration proved difficult and data from both the online survey and the interviews were broad, affirming there exists more than one clear understanding of this practice. In the context of this research however, online global collaboration refers to the activities of geographically dispersed learners who use open online technologies to connect, communicate and co-create with others beyond their immediate environment. Participants in this study were motivated to design or join existing activities and projects where their students learn about others, as well as with others, in order to

satisfy curricular objectives, foster intercultural understanding and global competency, develop critical thinking and personal, social and ICT capabilities.

6.1.1 Research questions.

The main research question for the study presented in this thesis asked: How might online global collaboration influence educators' pedagogical approaches?

The following three research sub-questions were used to scaffold exploration and assist in answering the main question,

RQ1. What are the experiences of educators who implement online global collaboration?

RQ2. How do educators' beliefs about learning and teaching influence their engagement in online global collaboration?

RQ3. In what ways do educators' personal pedagogies enable online global collaboration?

Structurally, the remainder of this chapter consists of three main sections. Section 6.2: Online global collaborative educator interview themes, focuses on thematic findings from the case study investigating the phenomenon of online global collaboration, drawing on the educator interviews. Section 6.3: The Global Collaborator Mindset, reveals new tangible outcomes based on understandings of educator disposition and motivation. While Section 6.4: The Online Global Collaborative Learning (OGCL) Construct shares a new pedagogical approach based on skills, behaviours and the use of supporting technologies for online global collaboration in the classroom.

6.2 Themes from the Online Global Collaborative Educator Interviews

The scope of this research was diverse given that the eight interviewees were from different geographic locations, backgrounds and teaching situations. Despite these differences they revealed commonalities in teaching approaches, school context, enablers and barriers, and motivation to connect learning through online

global collaboration. The three main themes within this section relate to the three research sub-questions:

1) The educator as online global collaboration champion (RQ1) shares findings on the impact when teaching and learning goes beyond the physical classroom. It examines and discusses the K-12 school context, and the online digital learning environment, revealing barriers and enablers to online global collaboration;
2) The educator as proactive believer (RQ2) examines and discusses how participant beliefs around learning, teaching, and the use of technology impact disposition towards online learning and global collaboration; and,
3) The educator as online global collaborative pedagogue (RQ3) examines and discusses participant pedagogical approaches and practices, professional learning and school cultures that influence and empower online global collaboration

6.2.1 The educator as online global collaboration champion.

The first research question asked, "What are the experiences of educators who implement online global collaboration?" Addressing this question required conversations with participants about past and current learning experiences with digital technologies and online learning as well as school-based conditions influencing participant practices. Personal experiences and motivations were revealed while outlier tendencies prompted questions as to whether behaviours were typical of those who are singularly focused on pushing boundaries.

6.2.1.1 Education context.

As a global study the education context of the eight interviewees spanned five countries and included public, private and international K-12 schools. Participants had diverse teaching profiles: from Grade 1 to high school specific disciplines, library and ICT specialists. They were champions within their schools, overcoming barriers, forging new learning modes and solving online learning problems, in order to create new and engaging experiences for their students. If these experienced, yet 'ordinary' educators, as classroom teachers and specialists across a range of school systems can achieve this, then maybe others can too. Many participants, self-labelled as aspirant outliers, revealing outlier traits that included the use of alternative tools and social media and the creation of flexible learning environments for collaborative and global learning. This supports the findings of Arteaga (2012) where 'outlier' K-

12 educators develop new innovative approaches using digital technologies and networked learning. Few of the participants had like-minded globally active local colleagues, although those colleagues who knew about the global connections, were usually in awe and not openly negative. Some had enlightened and supportive administrators, within the context of other priorities for learning within the school. Often tenuous local support inspired them to find alternative camaraderie through virtual connections, to be mentors and mentored as members of the global village. Arnell (2014) also identified isolation, in the context of a lack of professional networks in the immediate working environment, challenged educators to find like-minded colleagues and collaborative partners beyond their borders.

6.2.1.2 Online learning in the classroom: The digital learning environment.

The digital learning environment (DLE), defined as a combination of hardware, software and networking, was a vital factor enabling participants and their students to connect, communicate and collaborate beyond the school.

6.2.1.2.1 Access to tools and online learning modes.

Due to more recent improved school situations participants claimed to have 'good enough' bandwidth and adequate access to appropriate digital devices and online resources to learn and collaborate online. For example, Stella's rural school had significantly upgraded the school internet connection, while Susan worked towards a BYOD environment in her classroom. Mobile and one-to-one BYOD access in some schools, through school policy, parent negotiation and/or grant monies, further supported independent collaborative learning objectives. Prevalence of digital tools (first order barriers identified by Ertmer (1999)), supported online global collaboration goals, however, participants confirmed that their focus was on open platforms and Web 2.0 tools, such as blogs, wikis, and platforms like Padlet that provided a neutral place for dispersed classrooms to come together online for learning. School policies typically block, contain, or are suspicious of Web 2.0 tools fearing loss of 'control' over the learning environment or decreased and inadequate privacy and security controls however participants learned how to advocate and usually found access within the school context to the tools they needed.

Relevant technologies used for online global collaborative activities by each interviewee are detailed in Chapter 5 (e.g. Table 5.2). Dominant amongst the tools used for personal and classroom learning were Skype, Google Hangout, Wiki, Blog, Edmodo, Padlet, Google docs, and Voicethread. This aligns with previous studies where Web 2.0 not only provided facility but was the catalyst for a shift in classroom dynamics: physical, virtual, collaborative and global (Greenhow et al., 2009; Light & Polin, 2010; Scalise, 2016). Hew and Brush (2007) found resources (as in hardware, access, time and technology support) the most commonly reported technology integration barrier. In contrast, Ertmer and Ottenbreit-Leftwich (2013) found teachers with strong pedagogical beliefs in the value of technology could overcome infrastructure barriers.

Access to appropriate open online tools is complemented by participant understanding of the importance of going beyond synchronous learning to embrace asynchronous 'blended' modes of online learning (Eaton et al., 2017; Harasim, 2000). An astute online educator such as Stella (in Australia) understood time zones and leveraged synchronous online modes, such as Skype, for connections with close countries in Asia where students in both schools were often in class at the same time. She also employed asynchronous modes with more distant countries, such as blogging or commenting via Padlet, where students can leave messages and responses for others to collect in their own time zone. Other participants also shared how engaging and powerful it was for students to interact asynchronously and receive comments on blogs and through other Web 2.0 portals as a result of global outreach activities. This complements the work of Kale and Goh (2014) who found educator readiness to use Web 2.0 tools depended on infrastructure, workload, PD and beliefs about the efficacy of the tools for teaching and learning. It also aligns with research by Light and Polin (2010) in terms of a range of tools utilised, and Phirangee (2012) where new tools afforded a shift in classroom dynamics. This study however, extends understandings around Web 2.0 use into cross-border dimensions through participant acknowledgement that suitability of tools, and awareness of both synchronous and asynchronous modes was vital for global collaborative success.

6.2.1.2.2 Online learning through global project structures.

Global projects afford a structure and imply a willing community able to implement online global collaboration. Interviewees declared they had most success with, and labelled as their 'favourite' or 'best' global project (of six or more weeks) those that were well established and/or designed with very clear structures and guidelines, and encouraged participants to connect through communication structures that bridged time zones through both synchronous and asynchronous modes. Participation in a global project usually provided all participants an opportunity to build empathy with others, immersion in effective problem solving and creative use of digital technologies while collaborating in meaningful ways. A community of practice built around the project afforded freedom to try out new ideas and the option to 'fail forward', in other words the new ideas may not be successful but are scaffolded or cushioned by ever-present collegial support.

Within this online global community, participants acknowledged learner accountability and a focus on personal capability that often lead to exponential learning opportunities for both them and their students. Communication pathways, including teacher-to-teacher, teacher-to-student and student-to-student (Anderson & Garrison, 1998; Moore, 1993), became vital conduits for success as part of a project's structural goals and objectives. On the flip side, participants also shared how disappointing it was when global project partners did not contribute, dropped out, and did not have the same expectations and accountabilities as them. The findings here reinforce the work of Harris (1998) and Wells (2007) while further informing that structure, design and management within the school and classroom context in conjunction with attuned communication and collaboration skills by the interviewees ultimately afforded successful global collaborative projects learning outcomes.

6.2.1.3 Online global collaboration: barriers, enablers and outcomes.

In Chapter 5 participants described what learning and teaching can become told through their individual experiences beliefs and approaches. This section further explores participant experiences and synthesises identified barriers and enablers to

reveal positive outcomes and impacts when online global collaborative learning takes place.

6.2.1.3.1 Barriers to online global collaborative learning.

Confronted with a range of barriers inhibiting the practice of online global collaborative learning to negotiate and overcome (or go around), participants shared they did not always find personal success or school community support. As a sense-making goal in this thesis, barriers are separated according to two themes: 'barriers to teaching and learning' and 'barriers to the digital learning environment'. Items are not finite, and some coexistence is observed between themes such that one can overlap and/or influence the other in a co-dependent way. 'Teaching and learning' spotlights the participant in the classroom and in the school, including relationships with students, colleagues, administrators and the wider school community. It focuses on barriers around the role of the educator as perceived by the interviewees themselves and as institutionalised by the school. The 'digital learning environment' refers to school infrastructure, access to and capability with digital tools, and prevailing attitudes, approaches and policies within the school.

Barriers are further differentiated according to three categories: 'dispositional', 'blended' and 'situational'. 'Dispositional' applies to barriers that participants were more likely to influence and personally control or adapt such as attitude, time, motivation and technology skills (related to second order barriers, (Ertmer, 1999)). 'Situational', applies to barriers externally imposed such as state testing, school policies and institutional technology access (related to first order barriers (Ertmer, 1999)). These are least likely controlled or adapted by participants implying they were not responsible for or had limited influence over the decision making process for teaching, curriculum, technology and other related factors. In addition, a 'blended' set of barriers is listed: a combination of both personal and situational depending on the teaching and school context based on mixed responses from the participants. For example, a prevalence for a content rich curriculum rather than process learning may be due to a lack of understanding around how to implement inquiry or concept based learning. Or, it could be that the school system expects content, with associated testing, as a priority over other process-based teaching

methods. The categories established are not exclusive and act as a guide only to the synthesis and understanding of this research data in the K-12 context.

A subjective choice was made as to which barriers were more likely to be dispositional. For example, the lack of time to implement online global collaboration was identified as a strong barrier related to why collaborations are not joined or why the participants themselves are not doing more in this area. Time could be seen as a situational barrier where a school imposes high demands on curricular and extracurricular activities including parent meetings and community interactions. Although Vangrieken et al. (2015) found lack of time to be a school structural characteristic hindering teacher collaboration, time as a nebulous quantity is more likely to be part of personal or dispositional choice to satisfy interests, energy levels and capabilities. In addition, the barrier of low technology skills could be construed as situational if related to lack of school provided professional learning or access to digital tools. However, it is listed as a dispositional barrier related to educator interest in and development of technology infused learning. In other words, despite the school situation, 'where there's a will, there's a way', as the participants in this research have collectively revealed. The following discussion refers to Table 6.1.

Barriers specific to teaching and learning

Barriers specific to teaching and learning are found in the areas of 'communication modes and global awareness', 'curriculum and workflow priorities', 'pedagogical isolation and autonomy' and 'the student as barrier'. Clear online communication ensures learning success through alleviating misinterpretation of curriculum or project objectives and is a skill an educator can learn and model. Interviewees developed personal strategies for effective communication: knowing how to respond to global partners in a timely manner; awareness of time zone implications; use of digital technologies to afford communication modes; and development of strategies for intercultural understanding. However, as global collaboration champions the participants were often adversely impacted by the lesser skills of potential global partners and colleagues.

Table 6.1

Snapshot of Barriers to Online Global Collaboration: Teaching and learning

Barriers specific to teaching and learning		
Communication modes and global awareness	**Dispositional**	• Interpretation of project goals and objectives • Inconsistent responses or contributions from other educators in a global project or other global situation • Difficulty with interpreting time zones and communication with others • Lack of intercultural understanding when connecting with different cultures, language differences
	Blended	• Limited understanding of and experience with how to communicate and learn with others at a distance using synchronous and asynchronous modes, including reticence with or fear of communication in other languages
	Situational	• Culture of isolation between educators within the school • Limited priority for developing external relationships and global awareness by the school
Curriculum and workflow priorities	**Dispositional**	• Issue with implementation due to personal time constraints • Global collaboration seen as 'one more thing to do' and not relevant or important in the curriculum • Low confidence with new approaches to learning
	Blended	• Other curriculum required by the school has higher priority • Encouraging other teachers to commit to global collaboration • School holidays and schedules not conducive to global collaboration opportunities
	Situational	• Over-crowded curriculum • High-stakes testing, focus on data collection for literacy and numeracy • Increased administrative tasks including teacher and parent/teacher meetings that impact time available for teaching and learning planning and activities • School-wide evaluation and accreditation process time consuming
Pedagogical isolation and autonomy	**Dispositional**	• Difficulty finding like-minded partners with passion for global collaboration • Unwilling to 'rock the boat' when autonomy threatened
	Blended	• Preferred focus is on content learning rather than process • Isolation as a teacher, nobody else doing it in the school
	Situational	• Constrained by pedagogical practices within the school • Exempt from decision making around choosing and/or using digital technology and curriculum priorities
The student as barrier	**Dispositional**	• Inability to build trust others at a distance that may lead to collaboration
	Blended	• Limited understanding of the use of social media and how to share and collaborate online to support learning • Isolation as a learner due to low confidence and/or experience with digital tools for virtual collaborative learning
	Situational	• Constrained by policies and/or approaches not conducive to connecting with others beyond the school

Reflecting on communication, Donna acknowledged how it was difficult communicating with some people even when face-to-face, while Jill lamented how communications (in person and virtual) were often interpreted in unexpected ways, therefore the need for flexibility in approach. Susan shared the inability of some colleagues to appreciate or embrace virtual communication, "Sometimes people see it as like how could you actually have any kind of connection or relationship with anyone you have never met?" When seeking global partners, participants found immaturity with asynchronous learning modes resulting in reliance on synchronous communication. The data revealed that participants took personal responsibility to overcome reticence and fear of communication with those beyond the school, while schools responsibly supported experiential development for learning globally through access to communication systems. The findings aligned with Snyder (2016) who informed global learning was impacted by teachers not responding in a timely manner, issues with time zone differences and effective communication, or even miscommunication, and with Stornaiuolo (2016) who discussed the importance of cosmopolitan activity through technology enhanced communication management. However, this study also supports educator leadership and problem solving through evidence of agile approaches to finding workable pathways for online communication and collaboration.

Situational to the school itself, participants pointed to a culture of isolation and lack of communication and collaboration between immediate colleagues. Narratives shared general and specific absence of internal collaborative planning mitigating development of global learning as a whole school or small team approach. Susan stated, "There is really nobody else in the school that's doing some of the stuff I am doing in the classroom with my kids". This aligns with Barbour, Davis, and Wenmoth (2016) who revealed a lack of inter-cluster and intra-cluster consistency and cooperation leading to isolated learning, and Oran (2011) who cited lack of contact with others in the same school as a barrier. The participants had already resolved issues of communication and connection sufficiently to implement global collaborative learning, although colleagues and potential viable global partners had not. It was generally communicated in the interviews that schools could take some

responsibility for communication and connection skills through encouraging wider networking and global interaction.

A major challenge in schools was how to strategically 'fit' online global collaboration into a full curriculum while accounting for reasonable workflow. Emotive responses from participants to this topic indicated personal understanding of how online global collaboration supports multi-literacies and curriculum standards and collective determination to actively work at curriculum integration rather than as an add-on. Oran (2011) found that although the curricula did not include global learning, educators were determined to overcome barriers and used global projects as an alternative to meet standards and skills required. Most interviewees were challenged with not only encouraging immediate colleagues to not view global collaboration as 'one more thing to do' in their busy schedules, but with finding global partners like-minded in approach to 'time' and curriculum integration as them. A lack of understanding about curriculum alignment through global collaboration coupled with inflexible school or approaches by colleagues was revealed by the participants as cause for global project attrition and a major barrier to online global collaboration overall.

From the situational perspective, increased administrative requirements due to evaluation and accreditation processes (Janice), state standards and testing (Claire), or mandatory data collection on literacy and numeracy (Stella), impacted school-based planning sapping the energy of the interviewees and leaving educators collectively time-poor, often not motivated to try anything new. This relates to lack of time to implement (dispositional barrier), and lack of commitment to a global curriculum because other needs have priority (blended barrier). In addition, the participants shared much about the school context and 'over-crowded' curriculum obligations where global collaboration became juxtaposed with other priorities. However, all eight interviewees revealed how they dedicated time and effort to finding potential global partners because they personally considered it a valuable part of their curriculum. As ICT specialists, Jill and Angela worked with time-poor classroom educators within their schools, while Janice, as a Primary level classroom teacher and cohort leader, tried to convince colleagues to take on global projects.

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Arteaga (2012) identified how time consuming and exhausting online communication and collaboration was amongst outlier educators, especially working across time zones while Oran (2011) had a similar view and revealed insufficient time to teach for global learning. Educator lack of time to integrate new technologies and curriculum was documented by Jimoyiannis et al. (2013) and An and Reigeluth (2011), and the demands of online collaborative work taking additional time by Redmond and Lock (2006).

Participants were challenged with finding like-minded partners with a similar passion for global collaboration and pedagogical approach. The barrier of pedagogical isolation applies in part to when 'something different' is happening in the classroom, or the educator has certain beliefs about teaching and learning that immediate colleagues do not understand, agree with or emulate in a camaraderie and collaborative way. Adopting outlier practices supports global connection objectives and cuts through pedagogical isolation. However, some participants acknowledged they then found it more difficult to build meaningful connections and collaborations within their school. Meredith focused inwardly on her class and outwardly on the external partnerships she created disregarding her immediate colleagues because of their preference for content and knowledge mastery and their lack of interest in global connections. It is interesting here to contemplate whether the isolation within a school is the catalyst for global collaborators to connect beyond, or whether those with outlier tendencies connect beyond, become focused on external connections and more dismissive of internal colleagues thereby enforcing self-isolation within the school. This aligns with and further informs the findings of Arteaga (2012) where outlier teachers philosophically and practically overcame barriers through discovery, sharing and reflection. Hur and Brush (2009) found advantages of online environments and combating teacher isolation as reasons to participate in a community of practice.

This research clarifies the need for educator autonomy in the classroom, in this context defined as curriculum and pedagogical independence in conjunction with digital freedom, in order to make choices for implementing and managing online global collaboration. Participants revealed how their schools and education

authorities were generally open to discussion about online learning needs and supported teacher autonomy, recognising the educator as expert in the classroom. They did this through unblocking sites (such as YouTube), and providing comfortable or better technology budgets. Both Donna and Stella felt comfortably supported by their schools while for Meredith updates in school and district policies and 'loosening' of bureaucratic requirements, including unblocked teacher accounts provided additional autonomy. Janice struggled the most with lack of autonomy in the classroom and having to seek permission, sometimes resulting in conflict with gatekeeper administrators. This lack of autonomy and choice is juxtaposed with Janice's intrapersonal ability to form online relationships with external teachers and classes through open online practices. Frustrations also came from Jill, who as the ICT specialist had no say in school technology purchases, and very little in educator PD, but managed to bring global collaboration to her own computer classes. Intersecting with these findings is a more recent definition of educator autonomy by Vangrieken et al. (2017) that revolves around educator collaboration, freedom to make professional choices and ability to participate in collaborative decision-making.

Pedagogical autonomy, in this context is the ability to not only choose and use relevant digital technologies, but to establish a connected and collaborative approach to learning. The autonomy is lost or compromised where there is a conflict between what the school may want, such as focus on content delivery or team-based grade level curriculum as with Janice, with what the educator may prefer to do, such as focus on the learning process and include global collaboration, such as the freedom Stella and Meredith demonstrated. This enriches the work of Ertmer and Ottenbreit-Leftwich (2010) who also found that the context in which educators work often constrains individual efforts and promotes a reluctance to adopt innovation. Some participants shared frustration around exemption from decision making for technologies and lack of autonomy when using online tools, which appears to translate as a lack of trust in the educator. For example, Janice was asked to take a blog down that she used to communicate with external partners. She was not willing to 'rock the boat' over this but saw it as a major loss of autonomy and trust. This study shows that new pedagogical approaches are emerging where educator

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autonomy is important, if not crucial to forging global connections and collaborations and these are often in conflict with a content-focused, administration-controlled DLE.

The student as a barrier to online global collaboration is an interesting finding from this research. Donna believed student mindset could sometimes be a barrier and, as a high school teacher, she referred to student readiness to trust others sufficiently for online collaboration. Students implicitly trusted their classroom teacher, but required reassurance and scaffolding to trust external others. According to Donna her students had no experience in online global projects before she implemented them and therefore they lacked confidence and skills. As a situational barrier to successful online global collaboration, the student could be constrained by school-imposed policies and/or approaches not conducive to connecting with others beyond the classroom. This relates also to student lack of ability to use social media for learning (or blocked from using social media in the school) when they typically use it for socialisation with others outside of school.

It was common across the interviewees' schools that students had a singular experience of online global collaboration due to a non-existent school program and/or lack of implementation in alternative grade levels or school sections. Student experience therefore was typically confined to one year (out of around 13 years in K-12). This limited continuity or depth of experience therefore prevented them from fully understanding and becoming fluent with required tools, attitudes, behaviours and accountabilities. Hence, the student becomes the barrier through unrealised potential related to lack of online and global learning skills that could provide adequate autonomy and trust to fully collaborate with peers and others beyond the school. As ICT specialists, Stella, Angela and Jill revealed more determined approaches to integrate global collaboration across the curriculum and work with the willing (or not) to do this.

Barriers specific to the digital learning environment

Despite schools having access to an adequate DLE, this study revealed a number of barriers to do with technology access and use. These are specifically in the areas

of 'the educator in the digital learning environment' and 'the administrative approach within the school' impacted how participants approached and/or were supported to implement online global collaboration. A summary is provided in Table 6.2. Participants in this study developed understanding about connected teaching and learning and technical skills for online and collaborative learning as a personal goal. They lamented how other educators had low levels of ICT skills and digital fluency coupled with low confidence to use digital tools for online, connected and collaborative learning. The school context may dictate this skill development to an extent based on accessibility and opportunity. However, as the interviewees collectively demonstrated, there is not just one way to collaborate globally and any skill development must start with a willingness and aptitude to embrace online learning and an appropriate attitude or mindset conducive to learning how to extend this into global collaborative modes.

Table 6.2

Snapshot of Barriers to Online Global Collaboration: Digital learning environment

Barriers specific to the digital learning environment		
The educator in the digital learning environment	Dispositional	• Low digital literacy and digital fluency skills • Low confidence to use digital tools for online, connected and collaborative learning
	Blended	• Reluctance or inability to share ideas virtually in support of others • Reluctance or inability to publish professional or student work online and share classroom activities and collaborations
	Situational	• Inadequate school-based access to online technologies • Closed online learning environments (such as Office 365) • Network/Bandwidth inadequate for full class participation • Inconsistent and unreliable technology • Exclusion from BYOD or other device-based programs
The administrative approach within the school	Blended	• Not moving forward due to the absence of research-based implementation of online, collaborative and/or global learning • Educator innovation or 'mistakes' are not valued
	Situational	• Closed school systems and networks due to policies or fear of the unknown influencing decision • School policies or lack of approval for tools such as Twitter, Skype or a class blog • Limited priority for global collaboration within the school

Participants revealed a willingness to use multimedia in conjunction with social media to openly share, contribute, create, and find global partners. This study suggests the practice of open publication (Cronin, 2017) and networked participatory

scholarship (Veletsianos & Kimmons, 2012) is inconsistent amongst K-12 educators. Interviewees shared how open and global learning within a school context lacks understanding and priority while educators generally are ill prepared to connect. Educators not ready to connect and collaborate may be a reflection of a DLE with inadequate and/or unreliable access to school-based online technologies, use of closed online learning environments like Office 365 (as opposed to open systems like Web 2.0 tools), inadequacies with network access and bandwidth restricting class participation, and lack of inclusion in BYOD or other device-based programs. Snyder (2016) found access to technology and online sites through the internet, website blocking and filtering, limited bandwidth and technology failures and device allocation caused some schools to exit global collaborative projects. Although Oran (2011) stressed limits on technology use in schools as a major inhibitor, this study confirms this practice continues as a major barrier in schools, especially in the more subversive area of limited access to alternative platforms that enable communications beyond the school.

Participants personally addressed the barriers of low technology skill and confidence, understanding of connected learning and pedagogical capacity. However, they collectively shared that workarounds for an inadequately established DLE included compromised efforts to connect and collaborate globally. Although causing frustrations for the participant, these often resulted in a new found flexible and agile approach in the classroom, ability to problem solve and 'make do' in a positive way, and new-found online communities. Reluctance by others to do the same could be related to their lack of understanding of how, and/or related to the school DLE context. Krutka and Carpenter (2016) found a change in educator practice through connected PLN development to active participation and ownership in their own professional growth.

The attitude and approach taken by the school administration had a major impact on an interviewee's potential and therefore ability and willingness to try new ideas. Closed technology systems as directed by the school, the state and/or organisation leading to lack of access to the wider community was noted as a significant situational barrier. Some participants shared how a typical approach taken by

administration (Head of School, IT Director and the like) oscillated between various fear factors about digital technology use mingled with a desire to support innovative practices. The perceived need for online security, privacy and a 'walled garden' learning environment within a school was usually the priority, often based on decisions made above the school level (e.g. district or state policies, or country-specific barriers to online access). However, these decisions were usually to the detriment of forming partnerships beyond the school, and reflected a lack of understanding about the benefits of online global collaborative learning. This further permeated into directives for participants to not openly publish student work or share collaborative learning online. Also noted was the absence of research-based approaches to online, collaborative and global learning that educators and administrators could learn from and apply within the learning environment.

This study affirms prevalence of school-based fear of online misuse, in conjunction with privacy and security concerns, continues to impact what an educator and student can access for learning within a school, and even more so impacts how they can connect and collaborate using digital technologies with those beyond the school. Participants in this study affirmed the need to develop digital citizenship along with global citizenship and worked hard building bridges from their classrooms to the outside world, observing school requirements, but at the same time pushing boundaries. Regardless of student age level, participants such as Meredith, Stella and Susan confidently and with sound educational reasoning connected students with others in an educator-controlled environment allowing them some independence to become reliable and responsible digital and global citizens.

6.2.1.3.2 Enablers to online global collaborative learning.
As global collaborative champions, participants determinedly moved beyond the expected norm for a classroom or specialist educator in order to implement online global collaboration. Enablers are shared here through the themes of 'teaching and learning' and 'the digital learning environment'. Characteristic enablers are segmented into two key categories: 'dispositional' and 'situational'. Dispositional refers to enablers within the school, classroom and professional context that the educator most likely has control over while situational refers to enablers that the

educator is not as easily able to, or finds impossible to control. The following discussion about enablers refers to Table 6.3.

Enablers specific to teaching and learning

Teaching and learning specific enablers are discussed in the areas of 'educator attitude and approach', and 'educator readiness for global collaboration' (dispositional), and 'educator support within the school' (situational). Participants confirmed that readiness to implement online collaboration was directly enabled by their personal attitude or mindset (also referred to as personality by Jill) and positive approach towards new ideas. This study reveals that more experienced, largely older educators have leveraged advanced communication and collaboration skills in order to adopt, adapt and forge ahead with online global collaborative learning. Experience and a deeper knowledge of classroom methodology coupled with an attitude of wanting to break free from the constraints of teaching, as it has always been done, can lead to amplified learning experiences. The participants indicated belief in and ability with rethinking the role of the teacher and this helped them adopt more advanced, digitally enhanced pedagogies. Jill commented, "I like to think that as teachers become a little bit more experienced in their teaching they've got over the nitty gritty of what they're doing in the classroom then they can sort of broaden out a little bit more". In addition, they collectively demonstrated a willingness and ability in fostering student accountability leading to reliability when collaborating globally.

A significant enabler was participant interest in and readiness to engage with like-minded collaborators. A clear understanding of how to connect, collaborate and work with others is an enabler and this included within a school where a co-teaching and/or mentoring relationship is established, and between schools where educators reach out to others through networks and online communities. Building a small and trusting global network (PLN), or a variety of networks, helped forge necessary relationships and empathy with others. However, as Janice mentioned, it cannot be assumed that everyone in your network is in favour of, or willing, or able to implement online global collaboration in a similar way. Stella advocated for culture change amongst educators within a school to understand, "how to network, how to learn from their network, how to share with them and how to add value to it."

Table 6.3

Snapshot of Enablers to Online Global Collaboration

Enablers specific to teaching and learning		
Educator attitude and approach	Dispositional	• Positive approach towards implementing new ideas in the classroom • Experience in the classroom as catalyst to rethink the role of the teacher and move into more advanced pedagogies leveraging advanced communication and collaboration skills • Advanced ability to foster student accountability and reliability for online collaboration
Educator readiness for global collaboration	Dispositional	• Interest in online learning and global collaboration • Open to participate in different online activities and knows how to join in • Allocates time for mutual sharing with peers • Strong PLN with also a small and close trusting global network • Connection with educators already collaborating globally who may have existing pathways in place
Educator support within the school	Situational	• Encouragement from administration to collaboratively plan curriculum with school colleagues and others • Administration attend collaborative activities within the school and want to be kept informed of progress • Support for and approval to flexibly broaden and rewrite curriculum and include global collaboration • Administration team encourage 'out of the box' thinking
Enablers specific to the digital learning environment		
Educator facility with online and digital technologies	Dispositional	• Educator-centred control of technology and autonomy in the classroom • Able to use Web 2.0 tools and blended learning modes within the school • Focus on digital technologies to support connected and collaborative learning
Administrative approach within the school	Situational	• Supportive Technology Director • Tech-savvy and supportive Principal/Superintendent • Administration engages in conversations around digital online learning and offers support • Supportive parents and school community for mobile and online learning • Technology infrastructure complies with online global collaborative needs for being online and networked • No major technology restrictions and websites unblocked for educational purposes as needed • Open access to Web 2.0 tools • Learning is shared with those beyond the classroom to foster an online audience and new partners

Research on outlier educators by Arteaga (2012) found this same behaviour. Developing this capacity as an educator takes time and motivation, and potentially works best when supported or at least acknowledged by school administration. Angela, who runs online TeachMeet sessions, talked about relationship building between people to make connections stronger and Claire observed the importance of

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the reciprocal nature of sharing. Janice advised that in her experience, if network partners were not positive or collaborative then the relationship and the collaboration would die.

Current approaches in schools to teaching and learning are reflected in the situational enablers revealed. Encouragement to plan curriculum collaboratively with colleagues, in conjunction with approval to flexibly rewrite and/or broaden the curriculum, are key pathways to global collaborative learning. Jill, Claire, and Angela were able to co-plan curriculum and collaborative learning objectives with their fellow classroom teachers and therefore drive curriculum embedded global collaboration. Supportive actions from administration were noted such as taking interest in global collaborative activities and "turning up" to witness an important/interesting event such as a real-time connection with another school. This finding affirms the work of Kim et al. (2013) who observed that a crucial condition for change is the active involvement of leadership.

Perhaps above all, participants discussed the 'permission' given by school administration to the educator to think outside of the box. The term 'permission' is used loosely here where some participants did not need or did not bother to seek permission, knowing they could try new ideas and continue to meet curriculum objectives and standards expected by the school independently. Enlightened support encouraged risk-taking and acknowledged that failure through innovation may happen as part of the learning process. Donna's school administration was particularly supportive enabling her the opportunity to experiment and 'fail forward', meaning she will likely make mistakes as part of the learning process but will do so in a supportive environment.

Enablers specific to the digital learning environment

Enablers to implementing online global collaboration related to the DLE are discussed in the areas of 'educator facility with online and digital technologies' (dispositional), and 'the administrative approach within the school' (situational), as shown in Table 6.3 above. Digital technology implementation includes policies, purchases and professional learning. Careful planning and decision making in favour

of global learning and collaboration did make a difference to some participants' abilities to implement these new learning modes. School technology director and administrator support for a flexible DLE were a major enabler to online global collaboration. This included an enlightened approach to the use of online technologies whereby the infrastructure complied with online global collaborative needs and where there were few restrictions on access to websites and alternative, open tools. This aligns with Greenhow et al. (2009) who found how principles of collaboration and participation using Web 2.0 tools enable crossing of physical and cyber borders. Also enabling was participant and learner autonomy in the classroom with technology tools and networks and the ability to learn in blended modes. In this context blended learning refers to a mix of in-class and online activities, and also a mix of synchronous and asynchronous online activities.

Complex relationships existed between classroom educators and school administration. The tone of the school, established largely by school leaders/administrators, had a major impact, not so much on whether the participants collaborated globally, but how they did it and how this was viewed within the school. This affirms the study by Snyder (2016) into middle school curriculum which showed how both teachers' and administrators' buy-in was important to integrating digital citizenship, social media, and global collaboration. Some participants revealed a 'do it or die' attitude and were willing to go around school imposed barriers. However, findings in this study strongly affirmed a positive administration enabled deeper global learning. Stella spoke highly of her school administration, "They just love the fact that the students in our school are no longer living in their own bubble but they're actually out there interacting with the world".

It is important to have in-school conversations about online learning. Donna stressed that her approach was to let the administration and parents know what online activities were taking place and what was expected of students. Through an open door approach to communication, physically and virtually, with the school community, she fostered support and raised awareness of possibilities. Janice lamented her ongoing struggle for administrative and collegial support that stifled global activity, while Susan spoke about a supportive technology director and how

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she kept the Principal informed at all times, despite her practices not gaining traction with colleagues. Meredith continued to have support from administration to implement an innovative program that included global collaborative learning as an ongoing experience, despite being the only educator in her school doing this. Probably above all was the willingness of the schools generally to support the participants when they shared the globally collaborative learning process with a wider audience through social and other media.

6.2.1.3.3 Outcomes from online global collaboration in the classroom.

In this section, tangible outcomes and associated impacts of implementing online global collaboration in the classroom are identified and discussed. These were determined through positive learning experiences shared by participants. Included are outcomes for and positive impacts on learning for students, as well as outcomes related to the positive impact on the teaching and learning process. This discussion reinforces understanding of participant experiences and what teaching and learning can become through online global collaborative practice.

Outcomes for students are identified through the categories of 'engagement in the classroom', 'learning with digital and online tools' and 'intrinsic motivation, accountability and self determination'. Outcomes related to the teaching and learning process include the categories of 'adoption of new teaching methods and pedagogical approaches' and 'identification of new learning modes and opportunities'. These outcomes start to foreshadow evolving practice and pedagogies which are discussed in more detail later in this chapter.

Outcomes and impacts for students

Although this research focused on the educator, it is pertinent to include some discussion around student outcomes and impacts related to emerging pedagogies influencing online global collaborative practices. The interviewees talked passionately about improved student learning as a result of global connections and collaborations. The following discussion about outcomes for students refers to Table 6.4.

Table 6.4

Snapshot of Outcomes from Online Global Collaboration for Students

Outcomes for students	
Engagement in the classroom	**When learning is collaborative and global there is:** • Increased engagement and empowerment through adoption of an active participatory approach, including less disruptive behaviour in the classroom • Excitement at sharing learning outcomes with a wider audience • Motivation to co-construct meaningful products with others around the world
Learning with digital and online technologies	**The use of digital, online tools for global collaboration:** • Supports digitally ubiquitous and open modes of learning • Encourages the 'networked' student • Allows learning to be shared with family and others through online spaces • Builds a digital legacy that supports future goals • Fosters the realisation that technology can be used for more than 'social casual interactions' and can lead to productivity and intercultural understanding • Supports personalised learning where opportunities, processes and outcomes are not identical
Intrinsic motivation, accountability and self-determination	**Students adopt:** • An instilled love for collaborating • Strong recall in the future of global activities and experiences • A realization that personal actions have an impact and can make a difference and that individuals need to be accountable in a collaboration • A realisation that an audience and peer group beyond the immediate classroom can be leveraged for learning • A sense of freedom or self determination as a learner and the ability to learn with others and collaborate beyond the classroom

As a significant outcome to online global collaboration, participants overwhelmingly shared increased engagement in learning as students connected with others beyond the classroom. Excited about learning, students became empowered learners, realising that learning is 'life' and real, where an individual or group could make a difference, and that co-construction with others virtually was a powerful skill and objective. Janice adamantly claimed, "My personal opinion is that it enhances student engagement and when students are engaged the learning is amplified". Jill and Meredith both reinforced the 'real learning' that takes place through authentic communication, accountability to another class, and empowerment of students through tackling problems and making a difference beyond their immediate environment.

At K-12 levels, it is imperative for both educators and students to understand how to learn with digital technologies (Fullan et al., 2014). Online global collaborative activity supports digital ubiquity, fluency and open learning modes. It

also encourages artefact sharing with the immediate and extended community to amplify learning. Without the use of technology as a bridge to see and communicate with others, Donna observed that students did not really understand the purpose and power afforded by the tools. Students use social technologies for entertainment and find it difficult to equate the use of online tools for the purpose of learning and collaborating in an academic context. An important outcome therefore is realisation that digital technologies can support productivity and intercultural understanding, not just entertainment.

The 'connected' or 'networked' student (Drexler, 2010) continues to be a new concept to educators and students. According to Donna, her high school students found online virtual learning with others uncomfortable at first - they were not used to some of the tools and communication expectations, were more comfortable interacting with their peer group, and felt challenged conceptually and practically by professional connections with people they likely had not met before, especially not face-to-face. Angela saw her middle school students trying desperately to make connections and communicate with the others around the world and Stella encouraged her rural high school students to build their own networks and leverage them for learning, breaking the geographic isolation. Donna could not imagine a classroom where students do not communicate with others online and stated, "The dynamics of teaching and learning don't quite feel complete or necessarily appropriate unless students are allowed to have those experiences". She revealed her students felt disconnected in other classrooms where online connections and global projects were not embedded; they missed the dynamics of the connected classroom environment.

Student intrinsic motivation, including a capacity and preference for the art of collaboration, was another key outcome. Coupled with accountability and realising that personal actions impact others, participants described how students were able to explore and take advantage of the wider classroom that includes significant others – peers, experts, additional teachers. According to Meredith, her very young students realised personal actions do have an impact and developed more attuned levels of accountability to their partner classrooms. She also related how former students had

strong positive recall of past global collaborative activities. Connecting with the world for meaningful learning provided students the freedom and motivation to collaborate and co-create and find out answers immediately. As per the theory of heutagogy (Hase, 2016), the self-determined student global collaborator can emerge through opportunity to personalise an approach to learning and experience online global collaboration that connects individuals to partners they cannot see in person. Interviewees reported student ability to navigate online spaces, adopt multimodal communication and collaboration techniques (both synchronous and asynchronous) and understand the importance of virtual co-creation of new understandings and knowledge. What this means is the need for further examination of teaching and learning practices using digital technologies within a school and the role of the learner as autonomous, self-determined, capable, digitally fluent and globally aware.

Outcomes and impacts on the teaching and learning process

Teaching and learning are changing through the adoption of new technologies, pedagogical approaches and identification of new learning modes. Data findings are summarised in Table 6.5 and discussed in the following paragraphs. This study revealed how participants adopted a more constructionist philosophical stance, and/or a constructivist approach to learning also aligned with connectivism (Siemens, 2005), as well as Collaborativism practices (Harasim, 2017) through and with the effective implementation of online global collaboration. The participants also identified how teaching is more collaborative and open to networking with others at a distance, and learning is shared through open publishing modes such as blogs, wikis and other tools. As global collaborative educators they informed reaching out to others and developing a global network in order to find and establish partners for collaboration, hence reinforcing the work of (McLoughlin & Lee, 2010; Siemens, 2005), extending this to learning in a cross-institutional context. Sometimes this is organised already when cohorts of classrooms are created for global collaboration through established project designs such as The Global Read Aloud or iEARN Learning Circles.

Table 6.5

Snapshot of Outcomes from Online Global Collaboration Related to the Teaching and Learning Process

Outcomes related to the teaching and learning process	
Adoption of new teaching methods and pedagogical approaches	**Teaching is:** • Constructivist, connectivist and uses social constructionist approaches • Inclusive of new ideas and ways of building knowledge through confident and/or exploratory use of digital technologies and online learning modes • Inclusive of communication and collaboration skills using digital tools • Collaborative and open to networking with others at a distance • Inclusive of open publishing modes and approaches to sharing ideas and practices online **Curriculum is:** • Flexible and agile • Holistic and interdisciplinary by design
Identification of new learning modes and opportunities	**Learning is:** • Inquiry-based • Beyond the textbook • Autonomous and independent • Supported by new virtual learning modes • Supportive of English language acquisition and impacts on English as a Second Language (ESL) students • Focused and purposeful for low level literacy students • Inclusive of communication skills beyond the English language including listening and speaking skills • Inclusive of others (experts, peers) beyond the classroom • Collaborative and team-based • Intercultural with enhanced awareness, tolerance and empathy for others • Focused on a deeper understanding of one's country and place in the world, opening minds to collaboration with other cultures • Less ethnocentric with enhanced awareness of commonalities with others at a distance • Open with a focus on providing a digital learning legacy

Seeking out and finding these global projects, cohorts and partnership opportunities is part of emerging connectivist educator practice, aligning with An and Reigeluth (2011) who described how educators are motivated to acquire different approaches to virtual learning, acquisition of skills with new tools, and deeper understanding of how to learn with others online. Through online global collaborative practices, participants indicated teaching and learning can become inclusive of others, and shared with others in the school community and beyond through multimodal publishing using online technologies, as with Stella and her open approach global connections. School communities often get involved in collaborative learning experiences and interact through online blogs, school newsletters, and, as Meredith described, by young learners passing their enthusiasm onto their families at home.

The possibilities of online global collaborative learning have prompted participants to rethink curriculum in terms of purpose and design. A more flexible and agile curriculum, one that is not locked down to specific dates and set periods of time, was recognised as more desirable and workable in a global context. Agility is the goal in order to take advantage of casual global interactions as well as being ready to take on specific global projects that have more rigid start and finish dates. Curriculum design becomes holistic in approach with the understanding that global collaboration can be embedded into any subject and topic, especially interdisciplinary approaches, as it is not the content necessarily but the process of communication and collaboration, and the positive outcomes that are most important. While participating in online global collaboration participants were already cognisant of the impact on their practice understanding that curriculum flexibility leads to more options and global learning opportunities. Donna revealed an important impact:

> It has really opened my mind to be much more flexible, much more open to risk taking and much more centred around what students need to be successful in the 21st century…I think it enhances the curriculum, rather than forbidding us from getting through our curriculum.

Both Stella and Jill argued that adoption of online global collaboration came through careful curriculum design and ensuring most curriculum objectives would be satisfied through participation. Meredith, also adamant that global collaboration was not an add-on to the curriculum, stated how learning in a global context was an important shift in educator and school understanding as well as school approach.

Inclusion of online and digital ubiquitous technologies prompting new learning modes garnered responses from interviewees with terms such as 'inquiry-based' 'enhanced engagement' and 'enjoyment in the learning environment'. Stella thought her students learned more about what they want to know, not what they are told to learn and stated, "I think for teachers it's opening up their eyes to learning beyond the textbook, you can actually learn in real time from other people who actually live there". Claire perceived when online global collaboration is implemented in the classroom learning is inquiry-based; students construct their own knowledge through interaction with others and gain a critical understanding of the world outside of textbooks, beyond traditional learning modes. Participants talked about the positive

benefits of mixed communication modes for English as a Second Language (ESL) students as well as English speaking students as they developed listening and speaking skills with others, and became more motivated to read and write. Development of an enhanced awareness of self and one's place in the world, was described by participants, as well as a deeper knowledge of culture and country leading to decreased ethnocentricity and capability to build empathy with others in different locations. This idea enriches the work of Union and Green (2013) regarding the impact of using Web 2.0 tools for cross-classroom collaboration on overcoming ethnocentrism.

The challenge of new learning modes is building confidence in and empathy for online learning to make openness and sharing the norm, thereby potentially providing a cognitive advantage. The interviewees collectively regarded being open, through the use of age-appropriate tools, an important approach when learning online. Leaving an open digital learning legacy allowed students to see the work of others and raised the bar of learning with Stella claiming, "Kids are the best textbook for each other". Contradictory in terms of co-creation and openness, participants acknowledged that some students wanted to show a 'finished' piece of work rather than approaching it as a collaborative effort within a project. Donna found that her students preferred to share their work only with the people they knew, finding it uncomfortable to share with people they did not know. The importance of an audience aligns with learning as a process, not as an outcome, and students (as well as educators new to global collaboration) need to understand this shift, and have opportunity to practise and become skilful in it. As Angela stated, "Online global collaboration needs to be part of the learning, not on top of the learning".

6.2.1.4 Summary of the educator as online global collaboration champion.
In answering research sub-question one about experiences implementing online global collaboration, the global collaborative educators who participated in this study were self-determined, digitally savvy, outwardly focused and demonstrated outlier characteristics. As global collaboration champions in their respective schools they overcame barriers to implement enhanced learning outcomes for students. They lamented a lack of priority by administration and a lack of understanding and

compliance by colleagues. They were also disparaging about ongoing priorities for activities such as literacy, numeracy and data collection taking time away from student needs while collaborative global learning could provide essential personal skill development and more. The overcrowded curriculum in conjunction with being stymied further by accreditation and assessment processes equated to little room for online global collaboration within the K-12 context.

Herein lies much of the conflict in the context of online global collaborative learning: the interviewees saw their role as being autonomous (within certain sensible constraints), able to explore, implement, and create new opportunities for learning; whereas the school sees the educator role as firstly complying with all school requirements, and then, if time and energy permits, applying innovative options. The participants, as champions, want to be and are innovative; the schools seemed to want innovation, although within parameters. This is not to say the interviewees were breaking any rules, but they did push boundaries and isolated themselves, in some cases, from mainstream teaching and learning and from colleagues through their innovative practices.

6.2.2 The educator as proactive believer.

The second research question asked, "How do educators' beliefs about learning and teaching influence their engagement in online global collaboration?" Addressing this question initially required synthesis of the narrative around participants' personal beliefs to do with the use of digital and online technologies for learning online and when implementing online global collaboration in the classroom. In addition, participant beliefs around school enculturation were explored questioning whether and what change is needed to accommodate new approaches for online global collaborative practices.

6.2.2.1 Online learning beliefs that support global collaboration.

Fundamental to this research is educator belief in social constructivist learning (Harasim, 2012; Laurillard, 2009, 2012) and belief in the application of digital and online technologies to facilitate and enhance learning. Participants shared personal, flexible, proactive, versatile and confident use of social media and Web 2.0

technologies that allowed them to facilitate knowledge construction (not merely transfer knowledge) where they learned from each other as well as from students. According to Donna online global collaboration builds confidence as an educator and an online learner, and encourages out of the box thinking; Stella believed the learning is immediate and deeper than from a textbook; Janice discussed how learning takes different modes and supports multi-literacies; Meredith acclaimed support for digitally-infused inquiry-based learning; Angela acknowledged it built courage to experiment and not be afraid of failing; and Claire talked about 'flattening the world' through connection with primary sources to enhance understanding of others and situations. These beliefs align with the move towards an online collaborative learning mode where pedagogical approaches for global encounters are not always singular casual encounters, but as in global project examples, designed, planned and implemented as part of the curriculum to include online and blended modes.

One major belief supported by the data is the understanding that educators are no longer the experts in learning, or the gatekeepers of information and knowledge. This supports the literature for new learning partnerships (Fullan et al., 2014); connectivism theory (Downes, 2014); and Pedagogy 2.0 connections with peers and experts (McLoughlin & Lee, 2008). Online global collaborative learning requires a willingness on the part of the educator to let go of control, to 'flatten' the learning environment so that there is less hierarchy of authority and more learner self-determination in order to embrace collaborative inquiry. As Stella pointed out, when collaborating globally everyone learns together (students and teachers and virtual partners). According to the participants, this shift, brought about by access to ubiquitous digital technologies and global networks, means they developed risk-taking attitudes when integrating technology. They experimented with new approaches to learning, adapted to different situations, involved students as equals in the learning process, and above all maintained a sense of humour when things did not go to plan. Both Donna and Angela talked about not being afraid of failing, of understanding what could or should be happening in the classroom and working towards that personally and in conjunction with other educators.

The participants shared beliefs signal the era of open classroom doors, both physically and virtually and that learning is more collaborative now with access to tools making this possible. The educational value of openness, for personal practice and for students, is consistent across the data. A belief in openness led to the development of open resources (often in collaboration with others). Open communication and openly sharing individual and co-created products are aspirations, not always realised, but believed by the participants to be vital parts of the open classroom when collaborating globally. Janice talked about how online collaboration amplified motivation and purpose and increased academic rigour. She expected to make this happen in her classroom through modelling strong communication skills and building capacity for empathetic learning.

As an extension to simply 'collaborating', participants inherently believed in a greater purpose to online collaboration than just playing with digital tools and finding virtual classrooms to say "hello". They understood that true collaboration goes beyond the ability to connect and affect simple communications and indicated the desire to shift collaboration into co-creation with virtual partners. Co-creation, aligns with the research by Harasim (2017) and Garrison and Cleveland-Innes (2005) amongst others. A globally developed product or outcome brought about by sharing ideas and cultural identities, working and creating at a professional level with online technologies and avoiding the 'wastepaper basket' assignment ensures learning is authentic, real world and open.

Another strong belief held by the participants is the importance of autonomy with regard to use of digital tools and online learning. This applies to educator autonomy in the school and student autonomy in the classroom. Autonomy, already discussed above, applies here to how participants were given (or seized) the independence to orchestrate online global learning, removing any barriers preventing them from doing that. For students, autonomy applies to the personalised use of online technologies, self-determination as a learner and an open pathway to connect and collaborate with whomever they need to as part of the knowledge networking and learning process. These approaches collectively provide a new field for learning, locally and globally.

6.2.2.2 School culture and beliefs as catalyst to change.

Personal, global and collaborative beliefs and practices shared by the participants in this study were often in juxtaposition with the general school culture. They discussed beliefs around challenges to effecting change thereby identifying institutional enculturation that is detrimental to development of new learning modes and signalling possible actions and future directions. Stella stated, "I agree the culture does have to change. I think people need to be made aware of the true value of it all [online global collaboration], how it can support what they are doing in the classroom". In conjunction with previous discussion this indicates the need for curriculum agility and acknowledgment of the possibility and value of online global collaboration to support curriculum objectives; that the relationship between curriculum and pedagogy must evolve; and, that online global collaboration is possible and manageable in any school, at any class level. Jill articulated problems that included, "overcrowded curriculum, too much content to cover, with little opportunity to look beyond the classroom and fly a little".

Acknowledging how connected the world is and therefore that learning does not happen in isolation is another required cultural change advocated by participants. This mindset development for change included outwardly valuing external interactions and connected learning modes revolving around empathetic understanding of the value of learning globally while teaching students to adopt a more global mindset. Perhaps more importantly is the change needed in cultural attitude towards online and blended learning in the K-12 classroom. Participants observed how schools should actively review approaches to online learning, address current barriers preventing cross-school collaboration and potentially provide more opportunities for meaningful connection through the use of social media and Web 2.0 tools. This aligns with the research by Koehler, Newby and Ertmer (2017) and Blaschke (2012) regarding the affordances of Web 2.0 tools for participatory learning and directed heutagogical experiences. Susan struggled with administrators supporting her global collaborative classroom while not seeing the potential to inform a whole-school approach, while Jill and Meredith both 'escaped' to their respective global classrooms and worked largely in isolation from the rest of the school. Allowing online global collaboration to take place is one aspect of change

through raising awareness amongst administrators, but them actively giving it priority, while supporting the classroom educator, and planning for a whole school approach is likely the ultimate change. A whole school approach includes avoiding fear driven decision-making (e.g. fear of negative online behaviours by learners), in order to build capacity around how to best manage positive learning experiences when online and global.

Cultural change within a school relies on educator professional learning (Trust, 2016; Trust & Horrocks, 2017) using a variety of new modes to develop global skills for the local context. This research has revealed the need to design new professional learning modes that encourage and expect all educators to use online tools for learning, sharing and reflecting (Carpenter & Krutka, 2014; Trust, 2016). Administrative encouragement for open sharing with the wider community through blogs, newsletters, parent meetings, would provide incentives to early adopters and possible outliers. Informed by the data, school-based cultural triggers for change in the short-term could include: class teams not mandated to work so closely together when that locks them into the 'lowest denominator' while removing barriers for early adopters, ". . .so that they can blaze ahead" (Janice); recognition by schools that global learning is contextual for both adults and children and the reality that global collaboration should not be an add-on or a takeaway, but rather an approach that can be planned and implemented methodically (Meredith); adding 'global' to the school charter with global connections as part of the strategic plan so that educators then cannot just talk about it, they have to do it (Angela); and, wider implementation of project-based learning ensuring global collaboration became just another piece of ongoing practice and more widely adopted (Claire).

6.2.2.3 Summary of the educator as proactive believer.

In answering research sub-question two on educator's beliefs about learning and teaching and how these influence their engagement in online global collaboration, it was found participants in this study were advocates for influencing the school agenda in favour of prioritising online global collaborative learning. With the conviction to connect and collaborate beyond the school they had adopted a set of inherent beliefs including the efficacy of digital and online technologies to enhance

learning and the educational value of openness. Such beliefs align with the paradigm shift from educators as classroom experts to 'life coaches' (Zhao, 2018).

The participants also believed that online collaboration can lead to, or is a part of, co-creation with virtual partners; and that deeper learning takes place facilitated by new pedagogical approaches. They do this despite a school culture that is not fully supportive or understanding of what they do and how they do it. Angela shared a higher motivation, "We are growing the next generation of peacemakers and if we can get them talking with each other sharing, learning about each other maybe we won't have some of the big hassles that we've got going on at the moment". Strong beliefs about the need to mitigate negative school cultures pre-empt further discussion in this thesis about a whole school approach to changing teaching and learning paradigms. Figure 6.1 provides a snapshot of participant beliefs related to online global collaborative learning, as previously discussed.
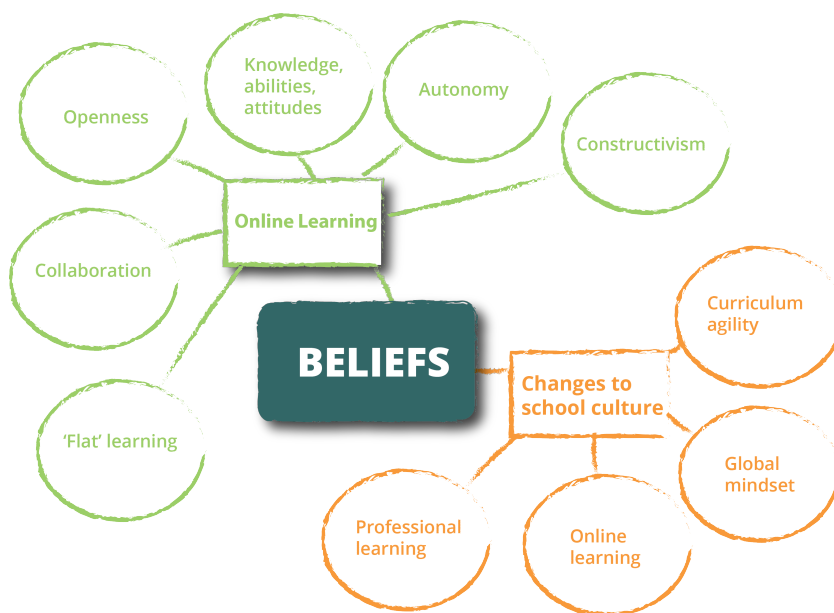
Figure 6.1: Snapshot of beliefs related to online global collaborative learning

6.2.3 The educator as online global collaborative pedagogue.

The third research question asked, "In what ways do educators' personal pedagogies enable online global collaboration?" Addressing this question required exploration of interviewee practices as a bridge to online collaborative learning

leading to global collaboration. According to the Cambridge English dictionary the term 'pedagogue' refers to "a teacher who gives too much attention to formal rules and is not interesting" (https://dictionary.cambridge.org/dictionary/english/pedagogue). For the purposes of this research the 'pedantic' aspect of this definition as applied to rigidity, strictness or narrow approaches in a negative sense is not inferred. Instead, further understanding comes from Morris (2018) who described a 'digital pedagogue' as someone acknowledging and working within a more fluid and adaptable learning space. Not all educators, therefore, are digital pedagogues, but those that are look for new ways to inspire active learning in the classroom with a mantra of "try something new" (Morris, 2018). With this vision of a pedagogue in mind and considering digital pedagogy as opening up the potential of networked and connected learning, this section explores personal pedagogical practices that enable online global collaboration.

6.2.3.1 Influences on personal pedagogies.

Facilitating online collaborative learning that leads to global collaboration is a new role for educators in the classroom, and involves new pedagogical approaches. Fundamental to learning and teaching is the paradigm shift to constructivist and inquiry-based philosophy. Participants' shared influences on personal pedagogical practices include educator disposition to online learning, educator approach to professional learning, and educator conceptual change. Further discussion around each of these areas takes place in the following section.

6.2.3.1.1 Educator disposition to online learning.

The personalisation and customisation of online learning through flexible, proactive and versatile use of social media and Web 2.0 technologies enabled participants in this study to embrace global online learning, and thereby influenced pedagogical approaches. All interviewees were actively connecting with other educators online and most leveraged social media to maintain a personal or classroom blog by choice. Empowered and fearless they implemented new innovative learning designs, inclusive of online and blended modes, that linked with required curriculum objectives. Coupled with this, they encouraged and scaffolded

students to personalise their own use of online technologies in order to collaborate within and beyond the school.

6.2.3.1.2 Educator approach to professional learning.

Paramount to understanding professional learning linked with preparation for online collaboration was that participants made personal choices, and no two pathways were identical. They all revealed that ability and confidence essentially developed through the action of collaborating globally. 'On the job' professional learning therefore was largely organic and experiential while broad educator networks (PLNs and PLCs) helped find global like-minded partners to extend and amplify collaborative objectives. Each interviewee was on a continuum, a pathway of development to improving the application of online global collaboration and this journey involved making choices as to personal actions and which battles to fight within the school.

It is apparent that participants not only acquired a certain disposition and belief system in the value of online global collaborative learning, they also acquired knowledge and developed skills in order to collaborate globally. Although lacking a singular pathway to success there is evidence of commonalities amongst the interviewees. Self-motivation prompted participation in activities such as Skype in the Classroom, interaction through Twitter hashtags and Twitter chats, and in becoming active members of virtual global communities. No one was telling them to do these activities; there was no requirement to connect with others beyond the school, although most received recognition and support from school administrators who understood the value-added learning for all involved. The participants effectively became self-determined learners within an online networked ecology (Hase, 2016; Hase & Kenyon, 2000).

The practice of peer-to-peer mentoring that leveraged both local and networked colleagues was a powerful influence. Both Meredith and Stella mentioned the concept and practice of a mentor. Meredith developed a virtual mentorship relationship with another more experienced educator that continued and grew into her default, but not only, partner classroom for like-minded curriculum planning and

collaborative learning each year. Stella worked hard at being a mentor and acted as the bridge to external opportunities for her local colleagues and more widely across broad global professional communities. Interestingly she talked about students needing a mentor as well, stating "They need to know how they can work together, they have to learn different tools and completely different ways of communicating, connecting to what they are used to." Susan claimed she 'plunged' into global collaboration without formal preparation. She described the virtues and affordances of Twitter and other online communities that she interacted with regularly, moving into relationship building and a broader concept of 'mentorship' within an online community.

Mentoring requires a relationship between the experienced and less experienced and Brabazon (2018) questioned whether transmission of knowledge that occurs during 'mentoring' actually works and advocated the practice of 'coaching' whereby focus is on the needs of a person at a particular time, is goal driven, and knowledge based, not experience based. Given that participants were on a continuum of personal development to build relationships of trust in order to learn skills and practices for online global collaboration, development of a pre-meditated program around a coaching model is likely a good approach.

Interviewee personalisation of PLNs and PLCs and the subsequent cross-pollination that takes place revealed an aptitude or disposition to open exploring and gaining skills through organic interaction. Stella, for example, connected with educators and organisations in many ways, including as a leader with noted online global organisations, following and using Twitter hashtags, and hosting a regular professional learning webinar. Personalisation of professional learning to suit individual needs and goals revealed an organic, self-motivated, self-organised, and flexible nature, complementing the work of Krutka and Carpenter (2016) around the digitisation of communities offered new forms of professional growth. The discussion by Charteris, Smardon and Page (2018) on Innovative Learning Environments (ILEs) interconnects with these findings whereby learning environments are reconsidered in terms of fluidity, flexibility and spatiality.

It is interesting to reflect whether online global collaboration mandated in the school would be as powerful and as supportive for these participants, and if they would continue along the same pathways, and seek out the same learning experiences. As Meredith stated, "Sometimes you are not really prepared, you just have to do it!" indicating a willingness (shared by other participants) to take the plunge and in fact learn 'on the job'. Stella used the word 'organic' and stated, "I relied on learning with the people I collaborated with, and I think it's by hands on and experiencing that, that you really learn very much about collaboration on a global scale." Janice also mentioned the fast personal learning rate when connecting with and learning from others beyond the school. Organic, self-organised peer learning implies the participants learned more about what they wanted to know, not necessarily what the school dictated they needed to know, and this was on a global scale, beyond the school and beyond the traditional organisational boundaries of typical professional learning.

Enhanced development and understanding of network and connection literacy and being able to troubleshoot online technologies were skills participants acquired through global collaborative practice. This included knowing how to network, learn from partners, and develop skills of sharing and 'teaching back', related to mentoring. Outcomes included building global and cultural awareness and fostering empathy for future global partnerships. The interviewees were already highly trained and had a raft of skills, however embracing new professional online learning modes that encouraged (or required) sharing back to the group within a supportive community, perhaps alien to other educators, but not to them. Angela, for example, ran online TeachMeet sessions and claimed it was about building relationships that made connections stronger.

6.2.3.1.3 Educator conceptual change.
Conceptual change is where understanding and practice about teaching and learning alter over a period of time. Although it is difficult to actually measure impact on wider educator practice and the value associated with that (leading to claims of pedagogical change) this research revealed significant impacts on approaches to personal teaching and professional learning that have led to new

educator-initiated connected and collaborative modes in the classroom. These impacts align with online global collaborative practices and it is interesting to note, once again, that the impact and change in practice is not always acknowledged or adopted more widely in the participant's school.

Two factors, ability and willingness, influence the adoption of new global learning modes. This study informs that an online global collaborative educator adopts a willing attitude conducive to implementing things differently. The incidence of 'older' participants in this research indicate this ability to adopt new attitudes is not ageist and is more likely to develop through experience and opportunity for growth as a practising professional. Attitude and flexibility were noted as vital impacts on practice evidenced by Claire describing the approach as being able to "build the plane as you are flying it", and Angela talking about the skill involved in adopting an attitude of 'risk-taker' in the classroom.

Empathy for and understanding of how to connect and communicate responsibly and reliably in both offline and online contexts are vital to the success of global collaboration and imperative to the conceptual change that takes place. This includes within a school through a co-teaching and/or mentoring relationship, and between schools where educators reach out to others through PLNs and PLCs. Participants revealed agile virtual communication habits with global partners led to collaborative learning, and shared purpose between educators resulting in 'faster' learning and an empowering experience.

Globally collaborative interviewees employed reflective practices such as writing a personal and/or professional blog and openly sharing for comments and feedback. They were also willing to use online technologies to connect with others, and had an aptitude to explore and gain skills with online learning. Open classroom approaches, such as tweeting in-class activities, especially when connecting globally, also encouraged interaction with and acknowledgement from online peers. Learning for both the participants in this study and their students took place largely in an open environment while connected to supportive PLCs. The learning environment ensures a range of online learning strategies that support student autonomy, as well as

educator facilitation and monitoring, modelling online global digital citizenship through effective collaborative practices.

6.2.3.2 Pedagogy or curriculum?

During interviews with participants, discussion ensued around whether online global collaboration is a pedagogical or curriculum-based approach. A range of responses were forthcoming from the participants including:

> It's another way of learning; it's another way of learning with people who are not right next to you but who have a different perspective and who have different things to offer (Susan);

> You're changing the way teachers are really teaching and students are really learning by how you're doing your global project and project-based learning (Claire);

> I think the pedagogy is there and I think the curriculum now needs to be developed (Stella); and

> It's more than pedagogy, but I wouldn't necessarily call it a curriculum. I think global collaboration for me is a necessity for us to teach children the skills they need for the 21st century, like in my opinion it should be a non-negotiable (Janice).

Donna articulated online global collaboration as a 'philosophy' of teaching and learning, stating:

> It's a piece of the philosophy because if we are really teaching students to be global citizens or helping them become these global citizens how do you do that without having a global experience and understanding what that really means? So, it becomes a philosophy, a way of doing business and then it becomes part of everyday teaching and learning.

As a curriculum approach participants demonstrated that online global collaboration needed to be 'put inside' the curriculum through the design of new courses, fostering better understandings of collaboration, and fostering student self-determined learning that is collaborative and global. This reinforces the work of Harris (1998) who has written at length about valid design of online global learning. As a pedagogical approach, and aligning with the message from Stommel and Morris (2018b), participants modelled best practices and adopted wholly, or at least in part,

a critical digital pedagogy. Donna clearly shared her belief in online global collaboration being a philosophy which aligns with the learning theories introduced in Chapter 2 such as Constructivism and Community of Inquiry whereby adoption becomes the basis for a holistic teaching and learning approach.

6.2.3.3 Summary of the educator as online global collaborative pedagogue.

In answering research sub-question three on what ways educators' personal pedagogies enable online global collaboration, the identification of emerging pedagogical practice related to this practice is a key finding. Online globally collaborative learning is enabled by educator personal pedagogies, thereby paving the way for improved pedagogical approaches and transformation of K-12 education. A certain type of educator embarks on the online global collaboration journey and when they do, it seems there is significant impact on their teaching and pedagogical approach, namely what they do in the classroom across the teaching and learning experience. As Donna observed:

> Global collaboration has really revolutionised my teaching and everything that I do, no matter what I'm teaching or what curriculum subject matter I'm working with it has really changed my approach and how I think about education.

In this evolving space of online learning, global learning, emerging technologies and changing educator practices, the data revealed three essential personal pedagogies enabling online global collaboration, and these are summarised below and shared as a snapshot in Figure 6.2. Educator enabling personal pedagogies include the following three areas.

Educator disposition to online learning:
- An enabling disposition to online learning ensures connected online interaction, collaboration and co-creation modes are sustained through the use of enabling technologies. This includes both synchronous and asynchronous learning modes and online global projects.

Educator approach to professional learning:
- An enabling approach to professional learning is reflected in participatory, flexible, self-organised, collaborative, and reflective learning relationships. Educators traverse local and global networks within and beyond the school as a pedagogical approach.

Educator conceptual change:

- Conceptual change is enabled through open and innovative online global collaborative learning and agile curriculum approaches to teaching and learning. This includes real-world learning that is open, reflective, strategised and autonomous and involves authentic relationships and designed curriculum approaches to take learning beyond traditional modes. It also includes positive approaches to global digital citizenship, and a focus on the process as well as the outcomes of global learning.
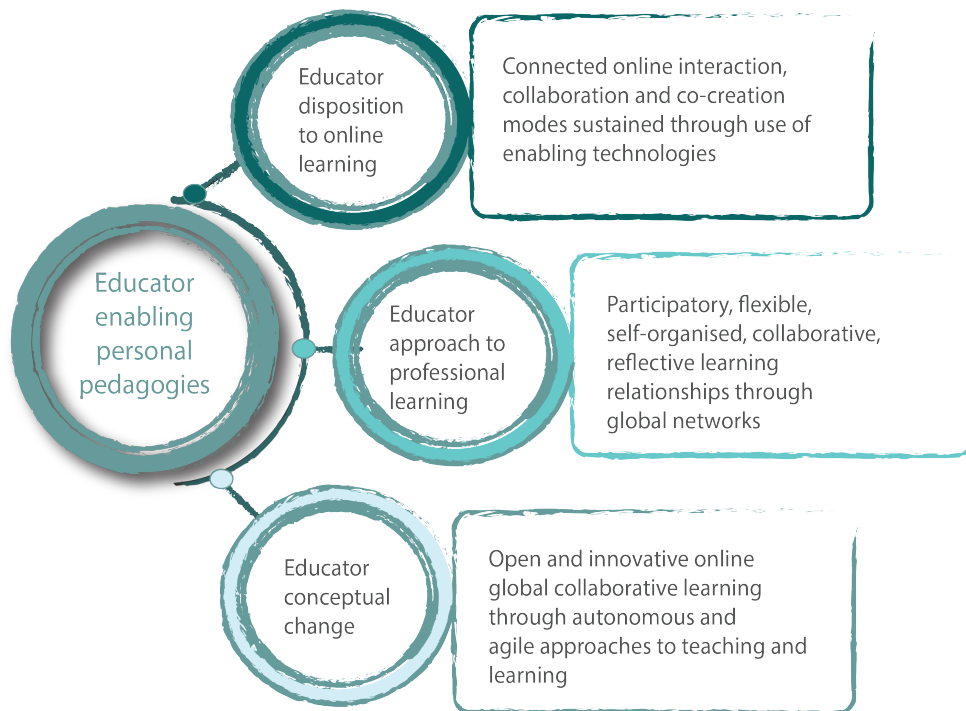
Figure 6.2: Snapshot of educator enabling personal pedagogies

6.2.4 Summary of Themes from the Online Global Collaborative Educator Interviews.

In the previous section findings from interviews shared the education context with barriers, enablers and outcomes to online global collaborative learning; educator beliefs to do with teaching and learning that influence their global collaborative practices; and the educator as pedagogue in the globally collaborative space. Findings indicate participants believed the purpose of online global collaboration was more than just using online technologies, and more than learning

how to collaborate online and even goes beyond simple intercultural interaction. Implementing online global collaborative learning develops new knowledge building capabilities, networking and communication abilities and expanded attitudes. New enabling pedagogical approaches are emerging that are connected, participatory and open with participants revealing a move into autonomous and agile teaching and learning approaches.

The next sections in this chapter reveal how these findings from the data have informed new ways of thinking and new structures applicable to online global collaborative teaching and learning in the K-12 classroom, and to leadership objectives within a school and supporting schools.

6.3 The Global Collaborator Mindset (GCM)

A conceptually new way of thinking about approaches to online global collaboration and how educators become global collaborators has emerged as an outcome of this research. In conjunction with new pedagogical approaches this research has revealed pertinent characteristics of educator readiness, capacity for and disposition towards online global collaboration through adoption of a common mindset towards teaching and learning. Identified as The Global Collaborator Mindset (GCM), an iterative process empowers educators in becoming skilled online global collaborators. The GCM enables participation in online global collaborative activities and potentially further influences pedagogical approaches.

Typically, a mindset, referring to a person's mental outlook or set of attitudes, and also referring to a belief or disposition, is the enabler or the barrier to new ideas and practices. It is likely the participants already had a GCM, however it seems that this has been further developed through online global collaborative practices as a cyclical, interdependent process, with a symbiotic relationship established between the practice of online global collaboration and the GCM. All of the interviewees indirectly inferred the term 'mindset', while some referenced it specifically. Their responses, related to personal beliefs about their own capabilities, personalities and subsequent practices, centred round having a certain 'mindset' conducive to online global collaboration. This juxtaposed with references to those of their colleagues

who 'did not have it', or in other words did not have the 'mindset' to apply online global collaboration.

In reference to a disposition towards online global collaboration, Angela referred to the "I can do anything" mindset as a major enabler, while Stella articulated characteristics of global educators as having, "Mindsets, confidence in using technology, confidence in being able to communicate with people who maybe don't speak English as their first language". Donna proffered the notion of a mindset complementing infrastructure and necessary to shift practice:

> I think we have the technology in place, I think some of it's going to be mindset, the fact that you know it can be done, I see sometimes when you bring up an idea they'll say, 'oh that's just one more thing', and I totally understand that teachers can be overwhelmed with expectations.

According to Janice, adopting a mindset for online global collaboration means an educator would have the attributes of patience, open-mindedness, flexibility, and confidence in their ability to learn new technologies in a positive and motivated way. She also acknowledged, "You know, that it's not hard because I think a lot of people just go 'oh I can never do that or I'll wait until I'm told I have to do that' and those are the kind of mindsets that hinder online collaboration". Meredith believed a global collaborative educator needs:

> A shift in beliefs about education because I think a lot of people still believe that it is about the mastery of content knowledge and the recall of content knowledge . . .teaching students to live with a more global mindset is a realistic and valuable approach in the current socio-political climate.

6.3.1 Shifting practice through adopting a Global Collaborator Mindset.

Dweck (2006) introduced the growth mindset as a motivating influence related to dedication and hard work, implying an attitude that supports successful outcomes. Discussions by Mansilla (2016) around cultivating global dispositions, although valuable classroom pedagogies, and complimentary to the findings shared here, apply to shifting student awareness, understanding and practices with the assumption that educators are already globally aware and competent. Just as Dweck (2006) challenged the common belief that intelligent people are born smart, the Global Collaborator Mindset challenges the belief that technology integration and access to online networks naturally means educators are global and collaborative. This study

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and the GCM also brings a new dimension to the 'asset' mindset, whereby educators approach global connections with empathy and the expectation of equality between partners (Klein, 2017), and the notion of global mindedness (Piacentini et al., 2018). In other words, this research has identified that, in conjunction with a skillset, it requires a certain mindset to become a competent global collaborative educator.

The proposition here is that educators do not naturally have a GCM and very few educators have shifted or changed their mindset, since the advent of online digital learning, to include online learning and global collaboration. It is also proposed the GCM can be identified, labelled, and then cultivated and learned. Suggested GCM development aligns with a belief that educators can continue to build on basic competencies, learn through continued effort and practice, and develop stronger pedagogical approaches to online global collaborative learning. It is only through a personal belief system and personal mindset that the motivation leading to the practice of global collaboration exists. This motivation to practice mindset aligns with the work of Ertmer (1999) and intrinsic second order barriers resulting in resistance to change through less tangible challenging of personal belief systems, however this study then extends this into the online global collaborative realm. Therefore, the goal of the GCM is to motivate educators to open their minds to new possibilities in order to introduce new ways of thinking, believing and doing, hence applying and extending the work of Duffy (2009) in relation to affecting a paradigm shift in education, with the initial target the mindsets of educators.

6.3.2 Attributes of the Global Collaborator Mindset.

The Global Collaborator Mindset (GCM) is a conceptually new way of framing dispositions and behaviours to explain why educators are willing and able to implement online global collaborative learning as part of their professional practice. Shaped further by global collaborative experiences and practices, the mindset itself becomes part of the educator's pedagogical self and helps enable transformation as an online global collaborator.

The GCM is tangible and can be learned and represents willingness, on the part of the educator, to take on challenging experiences, become a change maker, and

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connect learning beyond the physical classroom. The GCM supports the explanation of attraction to online global collaboration by the participants in this research as part of what they do in everyday teaching and learning. The implication here is the imperative of shifting to a mindset conducive to positively embracing both 'global' and 'collaborative'. For example, developing a networked perspective on learning is a powerful shift in mindset for an educator. To then apply that to global collaboration requires the mindset of a global collaborator, a GCM.

Key attributes of the GCM, identified through the research data, are connection, openness, autonomy and innovation. Collectively these represent a foundational structure instrumental to online global collaboration. These attributes, as shown in Figure 6.3, are discussed in the following section.
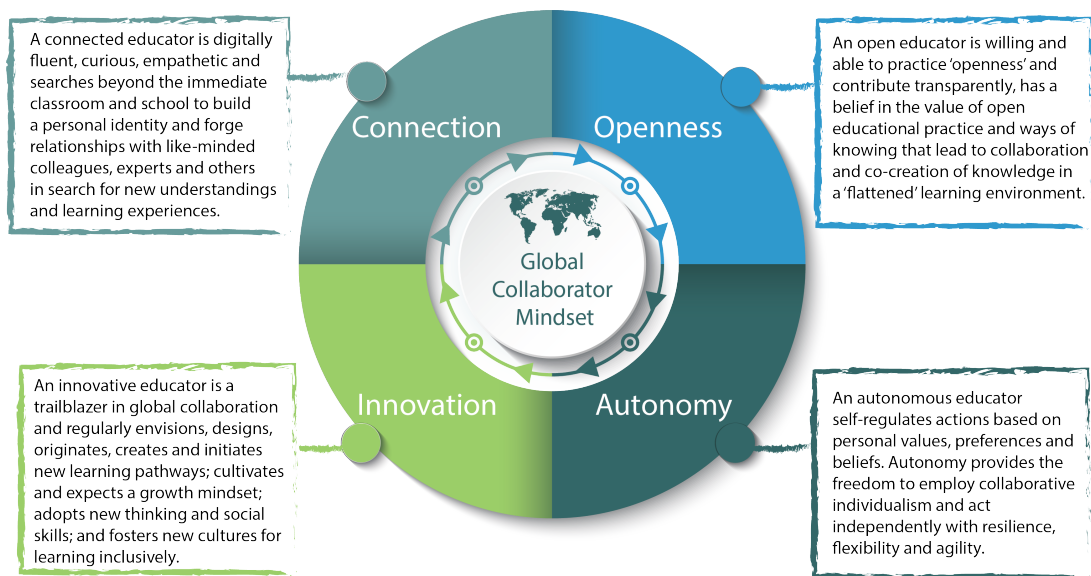
Figure 6.3: Attributes of the Global Collaborator Mindset (GCM)

6.3.2.1 The Attribute of connection.

> A connected educator is digitally fluent, curious, and empathetic and searches beyond the immediate classroom and school to build a personal identity and forge relationships with like-minded colleagues, experts, and others in the search for new understandings and learning experiences**.**

The attribute of connection and connectivity implies digital fluency and ability to work in online and blended learning environments to establish a professional online presence beyond the immediate confines of the school or organisation. An educator who is not connected to others beyond the school does not have a GCM. An online presence, perhaps even an online 'brand', includes global PLN development, for example Stella and her global network development while based in rural Australia. The Phase 1 survey data (Chapter 4) identified 'finding reliable partner(s)' as the main significant enabler to global collaboration. Connectivity enables the educator to develop a network of like-minded colleagues supporting virtual working relationships through confident application of both synchronous and asynchronous communication modes.

The attribute of connection enables curiosity and empathy with other cultures as a positive characteristic of connected learning. Educators with a GCM forge connections with others to develop authentic audiences and partners for collaboration. They also foster this mindset in their students and adopt a classroom-based pedagogical approach whereby learning that is not 'connected' to the outside world feels stifled and disconnected. Garrison (2016) recognised the importance and possibilities of online connection; Downes (2014) advocated networks and nodes to create connections; and, Blaschke (2012) purported the role technology plays in supporting multi-modal connections for learning through a heutagogical approach. However, 'connection' as an attribute of the GCM is more pervasive, includes the use of online and digital technologies, and goes deeper into educator beliefs and readiness.

6.3.2.2 The Attribute of openness.

An open educator is willing and able to practice 'openness' and contribute transparently, and has a belief in the value of open educational practice and ways of knowing that lead to collaboration and co-creation of knowledge in a 'flattened' learning environment.

An educator who is 'open' is broad-minded, understanding, receptive to other ways of knowing as well as willing and able to adopt practices that embed sharing of ideas, resources and collaborations around learning. This may be through social media, blogging, co-created wikis or other means. Open collaboration results in active appropriate sharing of personal output and student learning outcomes. An open approach leads to a shift in pedagogy where the key purpose of teaching and learning is the collaborative process, including co-creation, leading to knowledge building, regardless of content. It also leads to a more flattened learning environment, less hierarchy in the learning process, and a shift in teacher-student relationships. Openness towards others from different cultural backgrounds is a factor here, as are the dimensions of global competence (knowledge, values, attitude, skills) as identified in the OECD PISA global competence framework (Piacentini et al., 2018) where the goal is willingness to engage with differing world perspectives and build empathy with others.

An educator who is open leverages digital technologies to practice and share openly and fluently online and adopts a stance where learning can happen anywhere, anytime, with and from others. Cronin (2017) developed characteristics of the open education practitioner, including valuing social learning that align with this attribute of the GCM, and something the participants in this study have clearly communicated as a priority. Vangrieken et al. (2015) discussed an openness to collaborate, and Stommel and Morris (2018a) stressed the importance of openness in critical digital pedagogy leading to a re-imagination of cross-border communication and collaboration.

6.3.2.3 The Attribute of autonomy.

> An autonomous educator self-regulates action based on personal values, preferences and beliefs. Autonomy provides the freedom to employ collaborative individualism and act independently with self-determination, resilience, flexibility and agility.

The attribute of autonomy is applied here in a specific as well as a broad sense.

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Specifically, an autonomous educator is enabled to make independent decisions in their classrooms concerning curriculum, access to and use of digital and online technologies, and adoption of alternative pedagogical approaches. It also allows them to utilise personal values, preferences and beliefs to plan connections and implement collaborations with others at a distance. There has been some discussion previously about the 'outlier' tendency of global collaborative educators, and how outliers detach themselves from the main system to provide alternative opportunities for learners, thereby adopting new pedagogies to do so. It would seem that the educators interviewed for this research have some outlier tendencies however the main attribute they have, or want more of, as identified in the GCM, is autonomy and the ability to work within the school system to overcome barriers. These educators seek and crave autonomy and became frustrated when it eludes or is taken away from them.

More broadly, autonomy enables educators to be acknowledged as resilient leaders and risk-takers who cope well with change through adopting a flexible and agile approach with curriculum, classroom dynamics and global partnerships. They are willing to relinquish control in the classroom and adopt a 'flattened' learning style where they are not always the experts. Through promotion of self-determination in students, they are willing to be taught by them, accommodate different learning needs, and realise online global collaboration is not just one more thing to do, it is integral to modern teaching and learning. Blaschke (2012) referred to autonomy as the realisation of self-determination through a heutagogical approach. Interestingly, Vangrieken et al. (2015) revealed autonomy and the deep-rooted culture of individualism found in education potentially threatened by educator collaboration. In a later study Vangrieken et al. (2017) shared an updated conception of educator autonomy that includes collaborative decision-making and the freedom to make prescriptive professional choices resulting in a reflective, intrapersonal attitude able to self-direct in an interdependent context thereby facilitating collaboration without losing personal choice and freedom. Pertinent to this broader concept of the autonomous educator is what Limerick and Cunningham (1993) referred to as collaborative individualism, namely empowerment of the individual and the interdependence between individuals. Collaborative individuals, aligned with

autonomous educators, use digital technology to break isolation, become proactive and transform learning.

6.3.2.4 The Attribute of innovation.

> An innovative educator is a trailblazer in global collaboration and regularly envisions, designs, originates, creates and initiates new learning pathways; cultivates and expects a growth mindset; adopts new thinking and social skills; and fosters new cultures for learning inclusively.

An educator who is an innovator initiates, collaborates on and creates new learning designs for enhanced learning outcomes. Personally there is the expectation of a growth mindset along with development of original pathways for teaching and learning that include online collaboration as the new normal. An innovative educator also cultivates new approaches to global citizenship amongst students and peers with a focus on curriculum development that includes the sociability of learning, both online and offline. Through the desire to design or adapt original learning opportunities they model for and coach peers, while encouraging learners to use emerging digital tools and collaborative approaches. Enthusiasm for intercultural connections and collaborations foster tolerance amongst diverse learners and accessible ongoing design applications to implement, evaluate and modify global learning experiences.

An innovative educator focuses on processes, not just outcomes. Design thinking in conjunction with the design cycle as well as adoption of new thinking and social skills is used for global collaborations as part of the innovative learning approach. Reich et al. (2012) discussed the challenge of finding new tools to support innovative goals and that a tool such as a wiki does naturally support innovative, online pedagogies. Arteaga (2012) also referred to an innovative pedagogy developed by outlier educators through the use of social media and collaborative, global, open networking. The relationship between collaboration and innovation is noted by Vangrieken et al. (2015) who found schools became more innovative when educators collaborated. Laurillard (2012) claimed educators needed to collaborate to

design and facilitate effective and innovative teaching, while Facer (2011) related how the adoption of innovative pedagogies can lead to a paradigm shift in teaching and learning. The attribute of innovation in the GCM embraces all of these thought leaders and then extends this to declare innovation in teaching and in the classroom as the new normal, the new paradigm, that is expected and acknowledged. Table 6.6 shares a summary of the GCM attributes.

Table 6.6

Summary of the Global Collaborator Mindset (GCM) Attributes

Connection	**Openness**
An educator who is connected: • Designs and manages an online presence • Builds a Personal Learning Network, joins and leverages local and global Professional Learning Communities • Develops virtual working relationships with multiple stakeholders • Applies synchronous and asynchronous communication modes • Shares their own culture and is curious and empathetic with new cultures • Negotiates connections with significant others to develop authentic audiences and partnerships for collaboration	An educator who is open: • Leverages available digital technologies to create and share fluently online • Implements new ideas for teaching and learning with the belief that education is not just about content knowledge • Adopts a 'beyond the textbook' stance where learning can happen anywhere, anytime, with and from others • Flattens the learning so teachers and students learn together and with others beyond the classroom • Integrates new pedagogical practices in the classroom • Expresses empathy, is respectful of and receptive to other ways of knowing
Innovation	**Autonomy**
An educator who is innovative: • Practices online collaboration as the new normal • Designs new collaborative models for learning within and beyond the classroom • Cultivates growth mindsets and global citizenship amongst learners • Constructs new approaches and relationships to learning while social • Focuses on processes as well as outcomes through design thinking and design cycle applications to global collaboration and understand • Leads new ways of thinking and learning using digital technologies	An educator who is autonomous: • Assumes pedagogical independence and digital freedom • Plans classroom learning independently of and in harmony with other educators • Applies a flexible and agile approach with curriculum, classroom dynamics, and global partnerships • Demonstrates resilient as a risk-taker and is able to cope with change • Adapts online and blended learning modes to take advantage of global learning opportunities • Reframes actions as a leader in global learning • Develops interdependent networked relationships for globally enhanced learning

6.4 The Online Global Collaborative Learning (OGCL) Construct

Pedagogical applications of the Global Collaborator Mindset (GCM) lead to development of another outcome from this research, the Online Global Collaborative

Learning (OGCL) Construct. The following section discusses the theoretical underpinning of OGCL, and then frames the OGCL Construct as a conceptual and practical approach to implementing online, collaborative and global modes of learning.

6.4.1 Theoretical underpinning of Online Global Collaborative Learning.

As a pedagogical approach, the practice of Online Global Collaborative Learning (OGCL) refers to a set of skills, behaviours, beliefs and technologies supporting interactions and collaborations that are online and global in context. OGCL is enabled by and simultaneously enables development of a GCM in conjunction with online global partnerships for learning. It acknowledges but is distinct from 'Collaborativism' learning theory (Harasim, 2017) which is based on peer discourse and the educator acting as a representative and a gateway to the knowledge community within a particular discipline. In contrast, OGCL is based on non-hierarchical, independent as well as scaffolded connection, interaction and collaboration with peers, experts and other community members as part of the learning process. Collaborativism refers particularly to virtual collaboration between learners within the same institution or class, whereas OGCL applies to collaborations within and beyond institutions, hence the need for reiterative language and use of the word 'global'.

6.4.2 Framing the Online Global Collaborative Learning Construct

The origin and broader theoretical concept underpinning OGCL is directly related to the impact of online global collaboration and is a product of the elements 'collaborative', 'global', and 'online' learning modes. These exist independently and blend in various combinations. The construct as shown in Figure 6.4 provides a workable overview of learning objectives for online, global and collaborative learning.

Referring to Figure 6.4, collaborative learning (CL) applies to classroom or school based, localised non-networked activities. Global learning (GL) applies to individuals, classes and schools learning about the world from artefacts such as books, videos, letters, artefacts, where learning is non-networked and learners do not

'meet up' in any way. When collaborative and global learning initially combine, to form Global Collaborative Learning (GCL), connections and collaborations take place between geographically dispersed schools and systems, but in this iteration they are devoid of essential networking technologies. Although hard to realise in today's internet-based learning environment, this is likely the true origin of global collaboration: leveraged by real-time visits to new locations, books, and shared standalone artefacts further facilitated by worldwide postal services. This practice exists today where many schools develop sister-school or other relationships and associated practices of 'visiting' the partner country as a field trip, communication through class or student-written 'penpal' letters, and artefact exchange via 'snail-mail'.
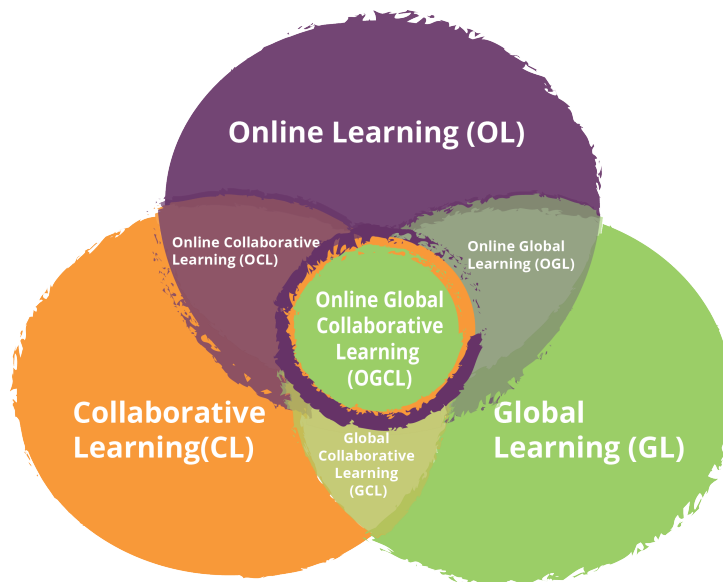
Figure 6.4: Online Global Collaborative Learning (OGCL) construct

Referring again to Figure 6.4, the advent of the internet catalysed online learning modes (OL) which, when combined with collaborative learning (CL) produces online collaborative learning (OCL). Similar to the term coined by Harasim (2012), Collaborativism or Online Collaborative Learning theory (OCL), in relation to higher education, the practice of OCL in this construct is localised and within the one classroom, or perhaps within the one school, school system or even university. This particularly applies to an institution whereby online collaboration is predominantly possible through internal digital technology platforms and structures. OCL can also refer to the use of supportive tools, external to the LMS, such as a

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blog, wiki, other Web 2.0 applications such as Padlet or FlipGrid, in conjunction with a pedagogical approach where a class of learners collaborate online with each other as a relatively closed community. When online learning (OL) is joined with global learning (GL) it provides the opportunity for online global learning (OGL). This applies to internet-based activities such as exploring the world through online resources, reaching out to external experts and organisations for relevant and updated information, following real world developments vicariously such as a polar bear expedition, or to solve problems. The intent is to learn about the world through real-world interactions, made possible by online networking.

Finally, Figure 6.4 demonstrates that when online collaborative learning (OCL), online global learning (OGL) and global collaborative learning (GCL) are joined or merged this results in Online Global Collaborative Learning (OGCL), as shown by the centre of the diagram. In this mode learning is online, collaborative with others beyond the immediate classroom (real or virtual), and characterised by ubiquitous, autonomous and open approaches. Connecting with the world for meaningful learning is not location based and provides freedom to collaborate and co-create with the contention that whom you learn with and what you construct together is most important. The practice of OGCL ostensibly takes learning beyond the immediate resources such as texbooks and educator knowledge to use the affordances of digital networks for occasional or ongoing online and global collaborative learning experiences.

In OGCL the educator has equal responsibility along with the student (where applicable, and scaffolded according to age) to forge online collaborative learning relationships and to self-direct, personalise and determine the learning. The OGCL construct is pertinent to K-12 global collaboration and applicable to similar collaborations between students, educators and classes at the higher education level, utilising the technology for cognitive learning through application of different pedagogical objectives (Ertmer & Ottenbreit-Leftwich, 2013; Jonassen et al., 1998).

6.5 Summary

In this chapter data gathered from the Phase 2 interviewees on online global collaborative learning in the K-12 classroom was discussed through the lenses of the three supporting research questions concerning educator experiences, educator beliefs and educator personal pedagogies. For research sub-question one on educator experience, critical outcomes, barriers and enablers were examined and discussed, as were impacts on the educator, the student, and the teaching and learning process. For sub-question two educator beliefs that enable participation in online global collaboration were discussed, and for sub-question three influences on emerging pedagogical practices were observed. The practice of online global collaborative educators was examined to reveal a disposition leading to a conceptual understanding of the Global Collaborator Mindset (GCM) and emerging pedagogical practice defined by the Online Global Collaborative Learning (OGCL) Construct.

It is significant here that participant data have lead to tangible outcomes and explicit models that can potentially support educators from any K-12 school and within any system. The GCM announces a collection of attributes that has application for study, practice and adaptation to the needs of the school system and location. The OGCL Construct, although broad in context, can be segmented and adopted as a whole-school approach to online learning and global collaborative pedagogy and curriculum. Chapter 7 concludes with a discussion on the main research problem of the influence of online global collaboration on educators' pedagogical approaches and reveals the culminating result and iteration which is The Online Global Collaborative Learning (OGCL) Framework.

CHAPTER 7 – CONCLUSION

In the final chapter a brief review of the research leads to conclusions around online global collaboration as pedagogical influencer. It considers the contribution to research, discusses limitations of the study, and makes recommendations for future research and synthesises recommendations for new educational practices, before concluding with a final reflection and summary.

7.1 Summary of the Research Study

This research revolved around the key question, "How might online global collaboration influence educators' pedagogical approaches?" The answer to this question can inform understanding of the strategies, beliefs and practices of educators who implement online global collaboration, and how this has impacted new pedagogical practices in the classroom. These understandings help identify enablers for using online digital technologies within the K-12 learning environment along with new paradigms for collaborative, online and global learning leading to enhanced outcomes for both students and educators.

A qualitative case study in two phases, the research included data presentation from the Phase 1: Online survey in Chapter 4 while the main focus on Phase 2: Semi-structured interviews conducted with eight, K-12 online global educators was presented in Chapter 5. Findings and analysis of data along with discussion around outcomes took place in Chapter 6. This was presented according to the three research sub-questions on educator experience, beliefs and personal pedagogies. The interviewees shared how they overcame challenges, including dispositional and situational barriers, in order to develop practices that embedded online global collaborative learning into the curriculum. The 'attitude' towards adopting online global collaboration was defined contextually as a 'mindset' and by removing this as a barrier the phenomenon of online global collaboration became the catalyst for disruptive curriculum approaches and new pedagogies. This is evidenced by excitement shared by participants over new connection modes, new global learning experiences, curiosity about the world sated by curriculum-based collaborations and co-creation possibilities.

7.1.1 Online global collaboration as pedagogical influencer.

The research problem investigated the influence of online global collaborative practice on educators as pedagogues. In other words, how educators may have changed what they do as practitioners as a consequence of implementing online global collaboration. Participants in this study revealed how they brought their personal constructivist beliefs and evolving pedagogies into play in order to leverage digital technologies for online, participatory, open, and collaborative learning. The actual practice itself enlightened and changed how the educators personally approached online learning, professional learning and their own capacity to change and adapt to new global learning possibilities.

In answering the key research question, findings revealed the phenomenon of online global collaboration impacted educators in a positive and profound way, and there is evidence of new pedagogical approaches that have become ingrained into everyday practice. It could be argued that some of these pedagogies were already in place, and that online global collaboration further developed or strengthened them. However, there is evidence to suggest significant new ways of teaching and learning have emerged. This research included interviewees from early years to senior school, and all were travelling on the same pathway or continuum to new learning paradigms and essentially concurred: this is what their classroom looks like; this is what the classroom of now and the future looks like.

Authentic learning was taking place in a student-centred, often student led, inquiry-based classroom. It started early, as evidenced by Grade 1 teacher, Meredith, who connected her students with peers for independent activities such as one-on-one Skyping and collaborative project-based learning. Stella and Donna showed us how at high school levels students worked in virtual teams and leveraged synchronous and asynchronous communication methods to collaborate on co-created products. Imagine what capabilities, both conceptually and practically, these students in Grade 1 would develop if the same pedagogical approach to learning existed in classrooms every year through to high school levels. Unfortunately, as reiterated by participants in this research, this opportunity is not afforded them. One isolated practising global

educator in a school does not make an online global collaborative learning program: it will likely not happen without a whole-school approach. It will also not happen as a short-term goal for either individual educators or as a whole-school initiative, hence a longer view is advised.

As the interviewees shared, professional learning for online global collaboration was largely 'on the job' through networking, practical application, mentor and mentee relationships, and risk-taking behaviours. Typically isolated within their own school and with an outlier profile, participants reached out beyond their classroom. They were autonomous and took on the characteristics of collaborative individualism, independently working towards global collaborative goals while connecting their local and global learning environments. Some then influenced others in their school using newfound online global collaborative knowledge, while others found their local colleagues were not ready to listen to them or understand their aspirational practices.

Participants regarded becoming 'open' as an important new pedagogical approach when learning online. Open participation in virtual global networks transformed professional learning allowing educators to receive and share ideas in multiple ways. Transferring this pedagogical approach to students encouraged openness when learning with others, shared digital platforms to capture ideas and, as a consequence, collaborative outcomes. Virtual collaboration through astute understanding and leveraging of infrastructure and new pedagogical approaches, demands new educator strategies, skills and dispositions. It requires understanding of the value collaboration brings to learning, and more importantly, the ability to embed online collaborative learning that is purposeful, uses the affordances of open virtual spaces, and relies on mutual trust and responsibility of each participant. Educators in this study understood that online global collaboration by its very nature implies asynchronous learning, which is another shift in classroom pedagogy required for smooth implementation. They also shared how they were making the pedagogical shift from 'collaboration' to 'co-creation' in an online and global context. This was cutting across deep foundations of individualised learning and personal accountability and impinged on assessment modes and mono-disciplinary

approaches to curriculum, forging new 'normal' learning opportunities in the K-12 classroom.

7.2 Research Contribution

This study contributes to the body of education research by presenting online global collaboration as a viable pedagogical approach to: build capacity with digital and online technologies; support intercultural understanding and global competency objectives; and instil capability with online communication to inform future workplace and lifestyle choices incorporating virtual collaboration and problem-solving. It comes towards meeting the needs of the classroom where learning is 'flat' and connected with an ongoing capacity for knowledge building through collaborative learning. In particular, an original contribution to knowledge is made in several ways and as a result this study advocates for a new pedagogical approach to teaching and learning that is transformative in concept and practice.

Firstly, it clearly identified the context of online global collaboration in schools, including enablers, barriers and outcomes. The school studies were diverse but had commonalities in terms of DLE structures and leadership issues.

Secondly it identified educator beliefs and existing pedagogies that enabled online global collaborative practice. This led to discovery of the major catalyst as to why participants are able and willing to implement online global collaboration in the classroom: because of their disposition, attitude or 'mindset', towards this practice. Educator disposition is translated here into the Global Collaborator Mindset (GCM) as a unique condition applicable to successful online global collaborative educators, as discussed in Chapter 6.

Thirdly, it identified new pedagogical approaches in the classroom as an outcome of online global collaboration and proposes the Online Global Collaborative Learning (OGCL) construct as a tool for understanding classroom learning modes that are online, collaborative and global, as discussed in Chapter 6.

Finally, this thesis makes an original contribution to educator practice through the Online Global Collaborative Learning (OGCL) Framework, incorporating dispositions and collaborative approaches. This is discussed further in the next section.

7.2.1 The Online Global Collaborative Learning (OGCL) Framework.

As a culminating result of this research a new pedagogical approach to teaching and learning has emerged called the Online Global Collaborative Learning (OGCL) Framework. The OGCL Framework, as a pedagogical construct, places online global collaboration in the context of the K-12 school and classroom, and is also applicable to other organisational units. It provides a focused structure to build educator capacity for online global collaboration. In addition, it addresses the findings of pedagogical change indicating a need to shift school and learning culture in order to enhance digital pedagogical knowledge, application and practice.

The centre of the OGCL Framework, shown in Figure 7.1, is the core of the all-important Online Global Collaborative Learning (OGCL) construct informed by the intersection of online learning, collaborative learning and global learning. Supporting the OGCL core are enablers, as found in the research: pedagogies, beliefs and competencies. Pedagogies refer to practices that are online, participatory, collaborative, holistic and self-determined (Heutagogy). Beliefs refer to what the online global collaborative educator considers as true for teaching and learning including learner efficacy, the value of learning 'with' and 'from', and that people and communities can bring about change. The competencies (capabilities, capacity, aptitude) of the educator support their ability to implement global collaborative learning including empathy, self-awareness, critical thinking, communication, design for learning, digital fluency and reflective practice.

Finally, the Global Collaborator Mindset (GCM) is represented in the outer circle of the OGCL Framework. Attributes of openness, connection, autonomy and innovation provide a foundational structure that interconnects with and buoys the OGCL construct and the competencies. The GCM is contextually applicable to the K-12 learning environment explored in this study. It is also adaptable to online

global collaborative learning in Higher Education and beyond, including organisation and business applications. Adopting a GCM acknowledges an openness to and awareness of diversity across education systems, countries and cultures and the ability to foster autonomous relationships. Early GCM adopters, represented by the participants in this thesis, identified opportunities and had greater sophistication in analysing local and global contexts leading to collaborative possibilities. A smoother, more flexible coordination between borders is possible with faster rollout of new products, concepts and technologies through efficient sharing across networks leading to a lower 'failure' rate. Mindsets can be drivers of both behaviours and outcomes. The GCM drives discovery, determines what a person believes are worth doing and helps determine competencies developed over time.
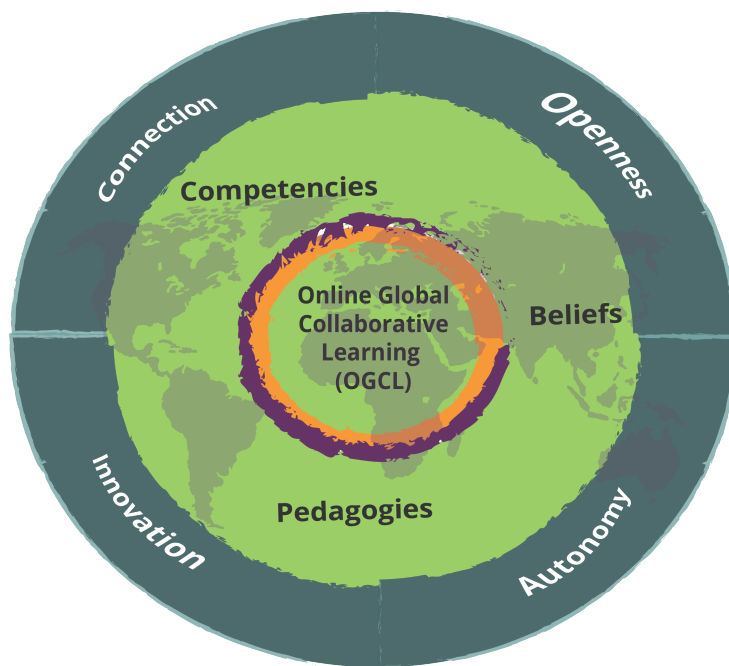
Figure 7.1: The Online Global Collaborative Learning (OGCL) Framework

The OGCL Framework provides a structural approach to learning that connects learners with others for collaboration and co-creation, and where the context of learning is 'with' rather than 'about'. This research has clarified that although the OGCL Framework as an approach can apply to the individual who is described as the online global collaborative educator outlier within the school, for pedagogical transformation the aim is for a whole school approach. Also, it is not a quick fix, or proposed as a 'novel' way to utilise digital technologies: there are too many of these

approaches in education already. What the OGCL Framework provides is a longer-term approach, adaptable to fit within the culture, the context, and the unified vision of a particular school or system. Support and capacity building for sustainability of the OGCL Framework must be driven from leadership at the top and leadership from the classroom in a combined effort.

7.3 Limitations and Delimitations

Limitations, namely constraints that are largely out of the researcher's control, could affect the outcome of a study (Simon & Goes, 2013). With qualitative research, associated limitations relate to validity, reliability and generalisability. Delimitations are decisions made by the researcher to compensate for acknowledged limitations (Simon & Goes, 2013). Consideration of research contributions is within the context of the following limitations and the strategies employed to delimit these. These limitations are characteristics of the case study design, sample size and composition, researcher bias and prior knowledge, and interviewee dispositions and behaviours.

As mentioned in Chapter 3, a pitfall of an embedded single case study design (Yin, 2014) is a tendency to focus on the sub-unit level (the educators in this study) and not return to the larger unit, or the phenomenon (online global collaboration). In some respects the predication of Yin (2014) has come true in that more time was spent focusing on the individual educators in preference to the main phenomenon. Although predicated around educators who implement online global projects, this study was not about the global project as such, nor about the individual educator. This study was about the phenomenon of online global collaboration in all of its guises, including as a curriculum objective (such as global projects), as a pedagogical approach, as an online learning objective to support digital fluency, and as a means of developing global competency. Focus comes from the phenomenon in Chapter 6 where lengthy discussion takes place to do with how and why participants made online global collaboration possible, tangible outcomes from this practice and the impact on them as pedagogues.

Another limitation was the small sample size of the Phase 1: Online survey and Phase 2: Semi-structured interviews. The online survey collected less than 70 responses, of which 65 were valid for research purposes. From these a filtering process, helped by triangulation of themes between participants, generated eight educators eligible and available to be interviewed. Due to the low sample size generalisation from the data is not possible and was not the intention of this study. The strength of conclusions from this research relies partly on the fact that the final eight interviews were with geographically dispersed educators from a range of K-12 teaching levels. This aligns with the aim to go beyond the confines of one particular education system, level or country. Strength also lies in the criteria for interviewees to have experience in online global collaboration through participation in longer-term projects. The composition of the survey sample was predominantly older women, and it is doubtful whether extending the timeline of the survey would have changed this, given my personal experience of working over the years of working mainly with this demographic in this space.

Perhaps the most obvious limitation of this research is my prior knowledge of the phenomenon that is online global collaboration and my relationship with some of the researched participants. Given that I invited educators to respond to the online survey through my regular online global networks, and given my role as an identified online global collaboration leader, many of the respondents were educators I had worked with in the past, were currently working with, or knew as an online acquaintance. My self-imposed boundaries or delimitations started with careful consideration of who to choose for Phase 2. Strict criteria, including educator ability and experience with online global collaboration, not personalities or collegial relationships, determined interviewee selection. This purposeful selection was my choice and under my control. I wanted a small number of active online global collaborative educators from a variety of geographical locations, limited to who had experience beyond a few collaborative exposures and who had already started to implement online global collaboration more broadly across and within the curriculum. Flyvbjerg (2006) stated this bias towards verification and tendency to confirm the researcher's preconceived notions as a typical misunderstanding of case study research.

The interview and educator disposition was another possible limitation. Some participants may have had the intention of telling me their story with an agenda of negativity and frustration, while others may have had the intention of telling me what they thought I might want to hear. It is possible they misrepresented or falsified information through agendas beyond simply answering questions and sharing practice. My approach to each individual interview, therefore, was to not 'lead' responses by offering my own experiences as a global collaborator. I also provided time and scope for all interviewees to have a final comment and cover anything they particularly wanted to reiterate or share beyond the scope of the interview, or to reiterate the interview research questions.

This research is similar to other studies in that there are some limitations. As the researcher I acknowledge the limitations of the research however, they do not detract from the significance of the findings in this research. It may be that further potential research emerges from these limitations.

7.4 Recommendations

The focus was on K-12 educators and how they are changing or transforming learning through new collaborative, online, and global learning opportunities. Outcomes particularly impact the K-12 learning environment, educator competency and capability, leadership paradigms, professional learning and teacher education. In addition, there is much scope for further research and an approach to research that can inform education globally. A series of recommendations or implications educators and education leaders need to consider prior to entering global collaborative learning experiences are shared in the section below. Following implementation recommendations are suggestions for future research through application of the outcomes from this study.

7.4.1 Implementation of online global collaborative learning.
The first and main recommendation related to school implementation is aimed at addressing the singular student experience of online global collaboration. A whole school approach in K-12 is required to implement and trial the OGCL Framework and build learner skills and competencies amongst educators and students. This

would require collaborative leadership approaches for capacity building and sustainability and be driven from leadership at the top and from the classroom in a combined effort. It would also require longitudinal planning, probably 2-5 years, for full implementation across all grade levels.

Secondly, affirmative action for curriculum-based collaborations is recommended in schools. Consideration for a program that builds educator networking capacity and mentor and mentee relationships, and PLN and PLC building with those already collaborating globally. The goal is to initially join existing projects and leverage the expertise of educators who are already designing new curriculum-based experiences and who have developed pedagogically sound ways to do this. Learning from these experiences and having greater knowledge of how to overcome barriers, a school would be in a better position when planning to implement the OGCL Framework.

A third recommendation is to focus on the Global Collaborator Mindset as a professional learning objective. Each learning environment (school, or university) could approach this in a personalised and unique way with the goal of developing skills, attitudes and behaviours to accommodate connected learning, open learning, autonomy and digital freedom in the classroom through curriculum and pedagogical independence, and to foster innovation for global and collaborative learning.

7.4.2 Future study and research

There is a need for research-based implementation of online, collaborative and global collaborative learning, potentially impacting policy change around curriculum and ICT access and use. The suggestions below derive from the research outcomes.

The first suggestion focuses on the educator in the classroom. Educators as creators of knowledge in the global classroom and the development of global collaborative pedagogy requires further research. In addition, the Global Collaborator Mindset (GCM) has potential as a future research agenda. Questions remain around the motivation of educators and how they might develop a GCM and how approaches to and outcomes from doing this may translate into changed

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pedagogical practices. Research could examine the GCM within diverse school contexts especially as a longitudinal study around shifting educational paradigms.

Secondly, leadership for global learning is a significant area for research. The simple question here is "Who is driving online global collaboration?" Research could be on leadership structures that support implications, requirements, mindsets and a shift in curriculum approaches towards 'flat' learning. Leadership here implies from above and from within. Researchers could investigate parallel leadership (Crowther, 2010), teachers as independent leaders (Crowther, Ferguson, & Hann, 2009) and collaborative individualism (Limerick, Crowther, & Cunnington, 2002; Limerick & Cunningham, 1993) through the lens of online global collaborative learning.

The third research suggestion concerns students and online global collaboration. Thinking around the future of schools and the potential impact on students Zhao (2018) claimed the need for a paradigm shift where the purpose of education is to develop individual talents. Future research therefore could focus on students and how online global collaborative learning supports their self-determination, possibly with a focus on international standards, such as the ISTE Standards for Students. How can the global student be the driving force behind his or her own learning? This goes beyond the networked student (Drexler, 2010) and opportunity for exchange and co-creation: there is a lot more to build on here. Further research could explore students at the K-12 levels as global communities of practice and knowledge creators in terms of starting to substantiate the term used by educators in this research that students are 'the best textbook for each other'.

The fourth research suggestion applies to teacher education and higher education. Although there are currently more studies available into the teaching and learning aspect of global connections and collaboration in higher education as compared with K-12 learning environments, further research into teacher education using the findings from this research as a springboard is advised. This study has direct implications for teacher education and indirectly supports the work and research of teacher educators such as Redmond (2011); Lock and Duggleby (2017);

and Smith (2014). Research focus could be supported by questions such as: How can teacher practice embed online global collaboration through pre-service training? What are the variables that determine whether educators will then be able to or want to implement online global collaboration into the curriculum once they are in a school? What will empower them to know how to do this and actually want to do this as part of their pedagogical toolkit? (e.g. GCM development?). How can the paradigm shifts revealed in this research align with imperatives for pre-service teacher learning? How can stronger mentor relationships develop between in-service and pre-service educators?

The fifth research suggestion revolves around the role of the global school and its stakeholders. A focus on the organisational and institutional change that occurs or that potentially takes place when learning becomes online, global and collaborative could explore the role of the school the role of the educator, the role of the student and the role of the extended community, in a flattened learning environment. What influences, supports, and determines change towards online global collaborative learning?

The sixth research suggestion is situated in further defining online global collaborative practice and exploring the existence and/or need for a more comprehensive taxonomy of skill development. This relates to interdisciplinary curriculum development, and even to school policy. It also relates to co-creation as an output to collaboration in terms of how to define this, what it looks like in the K-12 digital learning environment, and how it works in an online global learning environment at all education levels.

The seventh and final suggested area for future research is around educator gender and age and the seemingly predominance of older women participating in online global collaboration compared with men and younger women, as observed in this study. A predominance of older educators responded to the Phase 1 survey, therefore it could be construed that mature educators are more likely to implement online global collaboration - or perhaps are more readily available to complete online surveys. It may be that older educators are better networked online using social

media and more open to finding opportunities such as this through online communities. Or it could be they are more available and willing to respond. The sociability of online learning and associated cognitive requirements may mean that mature women naturally align with communities of practice and are more comfortable encouraging students to engage and interact. They may also be more comfortable with the challenges of collaboration, especially online and at a distance. But why? This would make a very interesting study, and likely lead to recommendations for gender equality in the globally collaborative education space.

7.5 Final Reflections

Without stating the obvious, this research area and my research journey has been challenging in many ways, a humbling experience, and something that has allowed me to grow my knowledge of online learning and global collaboration, in conjunction with my growth as a researcher and academic. Investigating what motivates and supports educators to become global collaborators is the culmination of 20+ years of working in this area that started in the 1990's when I was inspired to implement interdisciplinary global projects in Australia. As I moved around the world working as an educator in international schools, I brought this same drive and inspiration for global connections to new countries and contexts (Zambia, Kuwait, Bangladesh, Qatar and China) and continued to innovate through joining classrooms and supporting student collaborative learning. I wrote two books on the subject (Lindsay, 2016; Lindsay & Davis, 2012) and connected with like-minded educators who were online collaborators and 'knew' or were 'growing' the pedagogy. However, I felt stymied by a lack of clear understanding and pathway to advise other educators not in this space already and therefore commenced this research with a goal to help define what it was educators were doing and how they were doing it, and why others should also do it. I was heartened by one of the interviewees who commented that their administration would be interested in research around online global collaboration in terms of it potentially informing a whole-school approach in the future.

The transformation for me, from practitioner to researcher was slow in coming, and I thank my supervisors for their ongoing patience and support in continually

pointing out how the data (and only the data) must logically drive discussions, conclusions and outcomes in a doctorate. I was bold, and sometimes thoughtless. I knew instinctively and through my own experiences what was driving educators, and yes, well my data supported that, didn't it? For a long time during the writing process my narrative was murky and not clearly supported by the rich data I painstakingly collected and analysed. The outcomes seemed 'obvious' to me, but not to others. Capability when working with my data and subsequent academic writing did not come easily to me, and for a long time I resorted to vague, generalized statements that came from nowhere, and certainly failed to be substantiated by data.

One of my main revelations was a shift away from focusing intently on the technologies. I came into this research wanting to hone in on technology integration, use of online technologies for connection and collaboration: the how, why, and what in terms of educator use to support global collaboration. I was intent on exploring barriers and enablers to technology use within schools and educator pedagogical approach and changes using these. I read the work of Peggy Ertmer (Ertmer, 2005; Ertmer et al., 2012) very early on in this research journey and from then on had in my head to research about first and second order barriers to pedagogical change related to online global collaboration. This research contributes to these findings in that although schools in diverse global locations have access to hardware, software and networking, educators are not ready, do not have a connected, open autonomous and innovative mindset in place, or as Ertmer and Ottenbreit-Leftwich (2010) describe, a belief in the value or efficacy of using these resources to shift practice and do something different through integration of technology.

In many respects, the real revelation from the data is that online global collaboration is not as directly related to fluencies with digital technology as I initially presumed. Once I realised the real enabler is educator disposition, I took a deep dive into the 'mindset' of participants in this research, synthesising data to reveal the attributes of connection, openness, autonomy and innovation. When this research commenced I was labelling openness as 'visibility' of learning and used the word 'visible' when interviewing Phase 2 participants. However, prompted by my supervisors to always be rethinking my own dispositions, my thinking and

understanding has also shifted, and determined 'visible' may be misinterpreted and is not as inclusive as the term 'open' in terms of learning and collaborating, sharing and co-creating in the online space.

I am personally satisfied that findings in this study may contribute to pertinent ways forward, teachable and tangible pathways for others to understand and start to emulate and embrace in the K-12 environment and beyond. I am heartened and excited that this small corner of research may contribute to the bigger picture of why we need transformation in education for future challenges, what that might look like and how it can be achieved.

7.6 Summary

As a final summary, this research has shown that online global collaborative educators experience similar barriers and enablers within schools, regardless of geographic location. When implementing new learning modes that are online, global and collaborative the educators embraced outlier behaviours and attitudes within the school. Enabling and motivating them to implement online global collaborative learning is the adoption of a 'can do' mindset that informs a set of beliefs about learning and teaching that influence their engagement. Previously intangible but now, through this research, this mindset is described as a set of dispositions, behaviours, and skills labelled the Global Collaborator Mindset. Educator personal pedagogies influenced online global collaboration including relevant, age appropriate, open, connected and collaborative learning via global networks as a learned disposition and competency that is non-hierarchical, and linked with the real world.

In conclusion, outcomes from this research reveal online global collaboration has influenced educators' pedagogical approaches in three main ways: 1) connecting the learning within and beyond the classroom and school, local to global; 2) fostering open educational practice with a focus on digital sharing; and, 3) virtual collaboration leading to co-creation through multi-modal synchronous and asynchronous learning. Pedagogical transformation is such that these educators expect their students to learn while joined to the world, not necessarily in an ongoing

project format but through flexible and agile approaches, making direct contact with others to construct, deconstruct and co-construct knowledge. This is the heart of the pedagogical change revealed in this research. The educator role has shifted to being facilitator of global connections, inspiration for global collaborations and model for self-determined learning for students and other educators. Furthermore, the curriculum is fluid and 'designed' around the ever-present possibility to learn from and with others at a distance at any time.

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APPENDICES

Appendix 1: Phase 1 Online Survey Tool

Online global collaborative educators and pedagogical change

Phase 1 Survey

This survey is found online here: https://goo.gl/KW9P7g

Julie Lindsay through the University of Southern Queensland, Australia, is undertaking this project as part of a Doctor of Education degree. Contact: lindsay.julie@gmail.com

The research is designed to collect information from a range of educators in different parts of the world. It is expected approximately 50 educators will complete this Phase 1 online survey.

The purpose of this research is to collect information from K-12 educators to do with their involvement and practices with online global collaboration and the use of digital technologies with a view to analysing emerging pedagogies and enriched learning experiences.

Your participation will involve completion of this survey that will take approximately 45 minutes of your time. The survey is in three parts:
Part A: Demographic information
Part B: Online learning and online global collaboration, including 'Taxonomy of global connection'

Questions for Parts A and B will include anonymous demographic data and a focus on the use of synchronous, asynchronous and collaborative activity to support online global collaboration using technology. Questions will gather information about experience as well as opinion. The names of individual persons are not required in any of the responses for Part A or Part B of the survey.

Part C: Interest in participating in further research and further questions for 'Phase 2: Case Study' eligibility
This part of the survey does require name and contact details to be shared so that an invitation can be sent to selected suitable educators to be interviewed for Phase 2 of the research. Part C of this survey is OPTIONAL.

Your participation in this survey is entirely voluntary. Please note, that if you wish to withdraw from the research after you have submitted your responses, the researcher, Julie Lindsay, is unable to remove your data from Part A and Part B of the survey unless you complete Part C and provide identification. If you do wish to withdraw from this research, please contact the researcher (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland.

It is expected that this project will directly benefit you as a way to reflect and share on your use of technology in the classroom to support online global collaboration. There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

All comments and responses will be treated confidentially and data will not be shared. Any data collected as a part of this project will be stored securely as per University of

Southern Queensland's Research Data Management policy.

Clicking on the 'Submit' button at the conclusion of the questionnaire is accepted as an indication of your consent to participate in this project.

Please refer to Contact Details for Julie Lindsay at the top of the form to have any questions answered or to request further information about this project.

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au. The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

PART A: Demographic Information

1. What country is your nationality?
2. What country are you teaching in August-December 2015?
3. What is your age?
4. How long have you been teaching?

PART B: Online learning and online global collaboration

In the following questions:

'synchronous' refers to something happening in real time, occurring at the same time such as a virtual meetup or a live chat;
'asynchronous' refers to something not existing or occurring at the same time such as a co-edited wiki or discussion forum.
With some tools and practices there may be gray areas with these definitions. For this survey it is more important that you share what you are doing online than worry if you have the correct category at this point.

5. What synchronous online technologies do you use for your own personal learning? Please share one example of how you use these technologies for personal learning.
6. What synchronous online technologies do you use for student learning? Please share one example of how you use these technologies for student learning.
7. What synchronous online technologies have you used for intra-connection within your own class? Please share one example.
8. What synchronous online technologies have you used for inter-connections within your school, town or close geographical area? (Within the same time zone or close to the same time zone)? Please share one example.
9. What asynchronous online technologies do you use for your own personal learning? Please share one example of how you use these technologies for personal learning.
10. What asynchronous online technologies do you use for student learning? Please share one example of how you use these technologies for student learning.
11. What asynchronous online technologies have you used for intra- connections within your own class? Please share one example.
12. What asynchronous online technologies have you used for inter- connections within your school, town or close geographical area? (Within the same time zone or close to the same time zone)? Please share one example.
13. In what ways do you consider yourself a 'global educator'?
14. In what ways do you consider yourself a 'global collaborator'?
15. Please share your definition of online global collaboration in 2-3 sentences.

Taxonomy of Global Connection

The next questions ask you to refer to the Taxonomy of Global Connection diagram and explanation. This can be found online here: https://goo.gl/oTRWHk

16. How many times have you joined or initiated 'Level 2: Interconnection (geographically close proximity)' for your students?

17. Please give brief details about one Level 2: Interconnection experience. (Project name, URL, what students did).

18. Refer to the Taxonomy of Global Connection - How many times have you joined or initiated 'Level 3: Managed online global connection' for your students?

19. Please give brief details about one Level 3: Managed online global connection experience. (Project name, URL, what students did).

20. Refer to the Taxonomy of Global Connection - How many times have you joined or initiated 'Level 4: Student to student with teacher management (online global collaboration)' for your students?

21. Please give brief details about one Level 4: Student to student with teacher management experience. (Project name, URL, what students did).

22. Refer to the Taxonomy of Global Connection - How many times have you joined or initiated 'Level 5: Student to student with student management (online global collaboration)' for your students?

23. Please give brief details about one Level 5: Student to student with student management experience. (Project name, URL, what students did).

24. Describe your comfort level and ability to use online technologies for learning.

25. Describe your comfort level and ability to use online technologies for online global collaboration?

26. In your experience what are the main inhibitors or barriers to online global collaboration? How have you overcome these?

27. In your experience what are the main enablers to online global collaboration? How have you and/or our students benefited from these?

28. Please share any blog posts or online websites that show your online global collaboration activities and ideas. *

PART C: Interest in participating in further research

As part of the research design for this study a select group of educators will be invited to participate in Phase 2: Case Study. This phase will include an initial interview, and a follow-up interview. It will also ask you to share online material such as global project material, a blog etc. Please indicate here your interest in joining Phase 2. You will be asked to share further details to determine your suitability for this research.

Please note the 'period of this research' is August/September - December 2015. Further details about the research requirements will be shared with selected educators prior to accepting an invitation to join Phase 2.

29. Are you interested in joining Phase 2 of this research?

Further Questions for Phase 2 eligibility

Thank you for your interest in joining Phase 2 of this research.
Please note the 'period of this research' is August/September - December 2015. This is when interviews will take place and data collected. It is NOT mandatory that you and your students are doing online global collaborative work during this period of time. You may wish to join Phase 2 based on activities you joined in the past.
Further details about the research requirements will be shared with selected educators prior to accepting an invitation to join.

30. Please describe your current teaching situation (classroom? Tech facilitator? Administrator? Etc.)

31. Refer to the Taxonomy of Global Connection - Have you previously participated in or are currently participating in, or plan to participate in during the period of this research an online global collaboration of Level 3, 4 or 5 that has or will run for a minimum of 6-weeks?

PART C: Further Demographics and Information

Thank you for sharing that you previously participated in or are currently participating in, or plan to participate in during the period of this research an online global collaboration of Level 3, 4 or 5 that has or will run for a minimum of 6-weeks. It is very likely you are a suitable candidate for this research.

This final section of the survey will collect further demographic details from you.

32. Name
33. Personal email
34. School
35. School email
36. School or personal address
37. School or personal telephone
38. Skype ID
39. Twitter ID
40. Blog address
41. Other website URLs of importance you wish to share
42. Describe briefly an online global collaboration of Level 3, 4 or 5 that you participated in that has or will run for a minimum of 6-weeks. Provide URLs to online information if available.
43. Other pertinent information

Is there anything else you would like to share about your online global collaborative work or willingness to be part of this research at this point?

Thank you for your responses

Your responses are very important to this research and your time is much appreciated. If you have any questions please contact Julie Lindsay - lindsay.julie@gmail.com

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email ethics@usq.edu.au. The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

Appendix 2: Taxonomy of Global Connection

The chart below, Taxonomy of Global Connection, shows the hierarchy of connected learning that leads to collaborative interactions (Lindsay & Davis, 2012).

Level 1: Intraconnection (within your classroom)

This first level is about connecting students within a particular classroom or learning environment typically by using Web 2.0 tools. It is about how to connect students just within this environment both synchronously and asynchronously. It refers to learning online while face-to-face, communicating and collaborating online within the same learning environment and co-creating with others within the 'inner circle'.

Level 2: Interconnection (geographically close proximity)

The next level is to connect students and learning environments within the same area (school, town, district, state) and therefore in the same or similar time zone but not physically in the same classroom. There may be opportunities for real time meetings (in person or virtual) and the focus and skill acquisition revolve around 'distance' at a close proximity that actually 'feels global'. An example of this is where two or more teachers from the same limited geographic location decide to learn together using online technologies, such as sharing class blogs, or a mystery Skype call.

### Level 3: Managed Global Connection (designed collaboration)

This level implies that someone (an educator or group of educators) has designed an online global collaborative experience. It is where schools/classrooms join existing projects and complete certain work requirements. Typically students are not joined online to one another directly; however there may be opportunities to Skype or other real time meetings. The 'product' becomes a focus, such as a website or a scrapbook, and teachers are responsible for processing material from the collaboration and uploading finished work.

Level 4: Student to student (with teacher management)

This is where true student connection and collaboration begins on an individual student basis. Students make direct connections with one another to complete collaborative work. The classroom is levelled or flattened in that each student may have a unique learning goal that does not match others in the local classroom. Powerful peer-to-peer learning experiences can be created through use of online discussion forums and online collaborative authoring environments. Teachers manage, facilitate and monitor as well as determine the timeline for the collaboration and share completed outcomes.

Level 5: Student to student connections (with student management)

This is the most connected and 'flat' type of global collaboration where students take on leadership roles and manage the learning across classrooms, across the world. Teachers are available as facilitators and monitor digital citizenship, cultural disconnects and non-participation and intervene only where needed. Students should be independently able to access all online researches to complete the global collaboration in an autonomous learning environment.
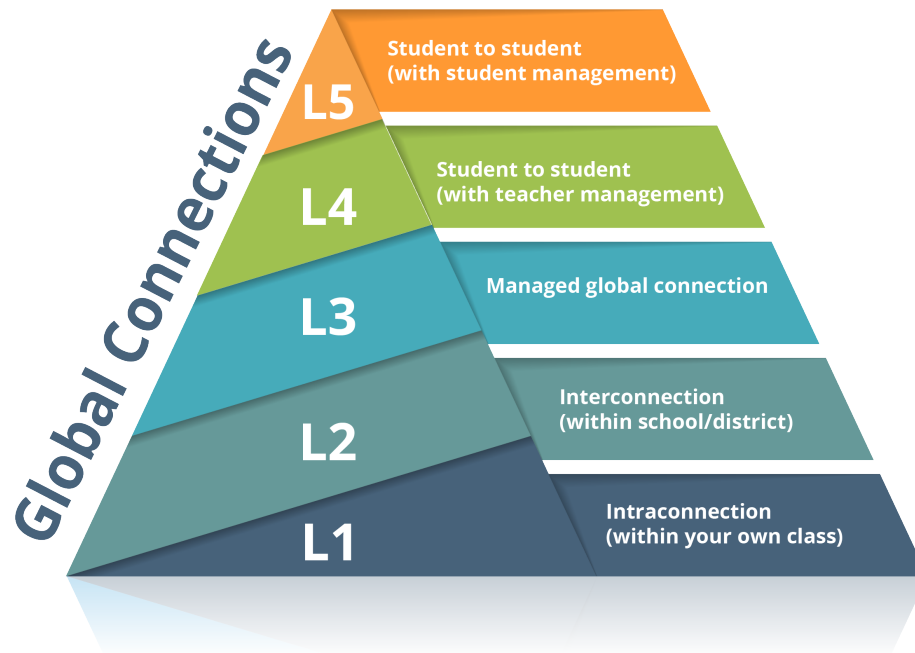
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Appendix 3: Coding Playbook

The Coding Playbook reveals tactics and strategies in data coding of educator Phase 2: Semi-structured interviews. After initial manual data coding (described in Chapter 3) a more complex approach saw data coded again using NVivo in order to deepen and enhance analysis by extracting key evidence in support of the main research and sub-research questions (described in Chapter 3).

The main research question: How might online global collaboration influence educators' pedagogical approaches?

The three sub-research questions are pivotal to the coding schedule:
1. What are the experiences of educators who implement online global collaboration?
2. How do educators' beliefs about learning and teaching influence their engagement in online global collaboration?
3. In what ways do educators personal pedagogies enable online global collaboration?

Coding schedule

Codes were created in three parts to align with the sub-research questions. These are summarised briefly below and shared visually in Figure A3.1.
- PART A - Educator experiences
  - A1: Education context
  - A2: Online learning in the classroom
  - A3: Professional learning
- PART B - Educator beliefs
  - B1: Learning online
  - B2: Online global collaboration
  - B3: Changes in school culture
- PART C - Educator pedagogical approaches
  - C1: Current pedagogical practices
  - C2: New pedagogical approaches
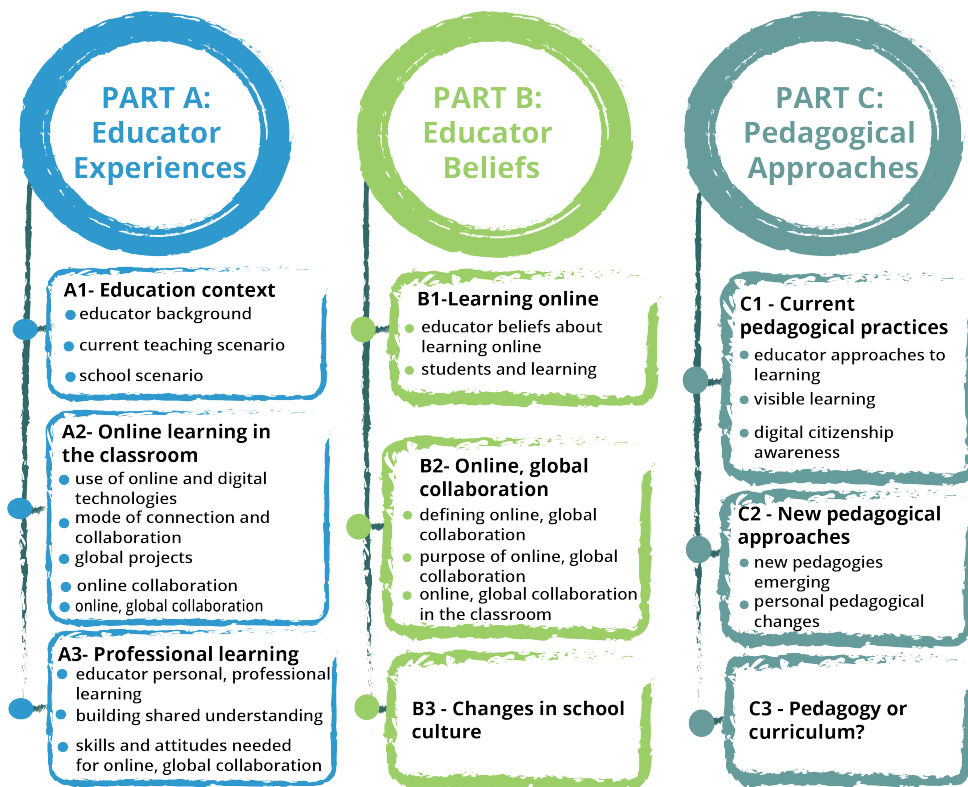 - C3: Pedagogy or curriculum?

Figure A3.1: Coding schedule map: Parts A, B and C

PART A Codes - Educator Experiences

Codes in Part A: Educator experiences identify past influences and current conditions within a school that impact educator practices regarding online global collaboration. This includes the current context around online learning - tools and access, as well as online global collaborative learning (barriers, enablers and outcomes), relationships with colleagues, and professional learning. The context of the school scenario and subsequent working and learning 'conditions' of the educator sets the scene for better understanding and analysis of motivations and practices. Figure A3.2 details visually the coding schedule map for Part A, while Table A3.1 provides detailed descriptions of each code section and sub-codes within the section.

Figure A3.2: Coding schedule map Part A: Educator experiences

Table A3.1

Codes for Part A: Educator experiences

A - Educator Experiences
Identifies past influences and current conditions within a school that impact educator practices regarding online global collaboration. This includes the current context around online learning - tools and access, as well as online global collaborative learning (barriers, enablers and outcomes), relationships with colleagues, and professional learning. Context of the school scenario and subsequent working and learning 'conditions' under which the educator works sets the scene for better understanding of motivations and practices.

A1. Education Context (ed_con)	
Identifies past and current influences and teaching contexts. This aligns with sub-research question 1 being an exploration of the experiences of online global collaborative educators.	
A1.1 educator background (ed_con_bk) Identifies teaching background and professional experiences including class levels taught, specialties, relevant positions of responsibility, evidence of teaching outside of home country.	**A1.1a global teaching experience (ed_con_bk_gl)** Identifies previous or current teaching experience beyond the home country
	A1.1b reflecting on past experiences (ed_con_bk_past) A code for reflective comments that relates to comments made about how things worked in the past (in the classroom or other context) in teaching and learning and which could be making a comparison with the current situation.
A1.2 current teaching scenario (ed_con_teach) Participants teaching situation at the time of the interview, including levels and responsibilities.	
A1.3 school scenario (ed_con_school) Identifies the current school situation and working logistics, including relationships with school leaders.	**A1.3a country specific comments (ed_con_school_cs)** Given the globality of participants this code applies to comments that are relevant to the country and context of teaching and learning.
	A1.3b access to technologies (ed_con_school_tech) Identifies the situation within a school related to access to and use of digital and online technologies, also includes teacher autonomy to make own decisions about what tools to use for learning.

	A1.3c working with other educators locally (ed_con_school_local)
	Explores the context of who and how many educators in the same school are also implementing online global collaboration and the relationship between them and the interviewee (what it is, what it could be, mentoring).

A2. Online Learning in the Classroom (ed_ol)
Explores approaches to teaching and learning while online, including tools and strategies.

A2.1 use of online and digital technologies (ed_ol_dt)
Use of specific tools for connection, collaboration and creation;
Shares comfort level and abilities (technical facility) when using online technologies in the classroom and for personal development or use.

A2.2 mode of connection and collaboration (ed_ol_mode)
Explores participant use of and key beliefs around synchronous and asynchronous learning modes.

A2.3 global projects (ed_ol_gp)
Identifies implementation of online global projects in the classroom.

A2.4 online collaboration (ed_ol_coll)
Identifies online collaborative learning in the classroom while using digital tools and working with others at a distance including parts or steps of the collaboration process.

A2.5 online global collaboration (ed_ol_gcoll)	A2.5a personal barriers (ed_ol_gcoll_per)
Identifies barriers, enablers and outcomes within the school and classroom context to implementation of online global collaborative learning.	Examines barriers that educators are more likely to be able to influence and personally control and adapt such as time, motivation and tech skills; includes student personal barriers such as mindset.
	A2.5b situational barriers (ed_ol_gcoll_sit)
	Examines barriers that educators are least likely to be able to influence and personally control and adapt such as state standards, testing, school prioritisation, other educators (such as those in a position of leadership or coordination).
	A2.5c personal enablers (ed_ol_gcoll_eper)
	Identifies enablers within the school and classroom context to implementation of online global collaborative learning of a personal nature such as teacher experience, professional learning, personal interest, mindset
	A2.5d situational enablers (ed_ol_gcoll_esit)
	Identifies enablers within the school and classroom context to implementation of online global collaborative learning of a situational nature such as administration, school community, access to technology
	A2.5e online global collaboration outcomes (ed_ol_gcoll_out)
	Identifies tangible outcomes from implementing online global collaboration in the classroom.

A3. Professional Learning (ed_epl)
Identify intentional and unintentional learning opportunities related to development of skills with online learning and online global collaboration, including tools and strategies and approaches to technology integration (challenges, successes).

A3.1 educator personal professional learning (ed_epl_per)
Identifies how participants gained knowledge and skills in order to implement online learning and global collaborative objectives.

A3.2 building shared understanding (ed_epl_under)
Explores how teachers connect with like-minded collaborators to share and build on understanding around online global collaboration; relationships with other teachers beyond the immediate school context.

A3.3 skills and attitudes needed for online global collaboration (ed_epl_sa)
Identifies skills and attitudes educators need to implement online global collaboration.

PART B Codes - Educator Beliefs

Codes in Part B: Educator beliefs explore attitudes towards and understanding of digital technologies while teaching and learning online and when implementing online global collaboration. School culture and the ability and willingness to affect change are also examined. These codes align with research sub-question 2 concerning beliefs and subsequent engagement with the teaching and learning process for online global collaboration. Figure A3.3 details visually the coding schedule map for Part B, while Table A3.2 provides detailed descriptions of each code section and sub-codes within the section.
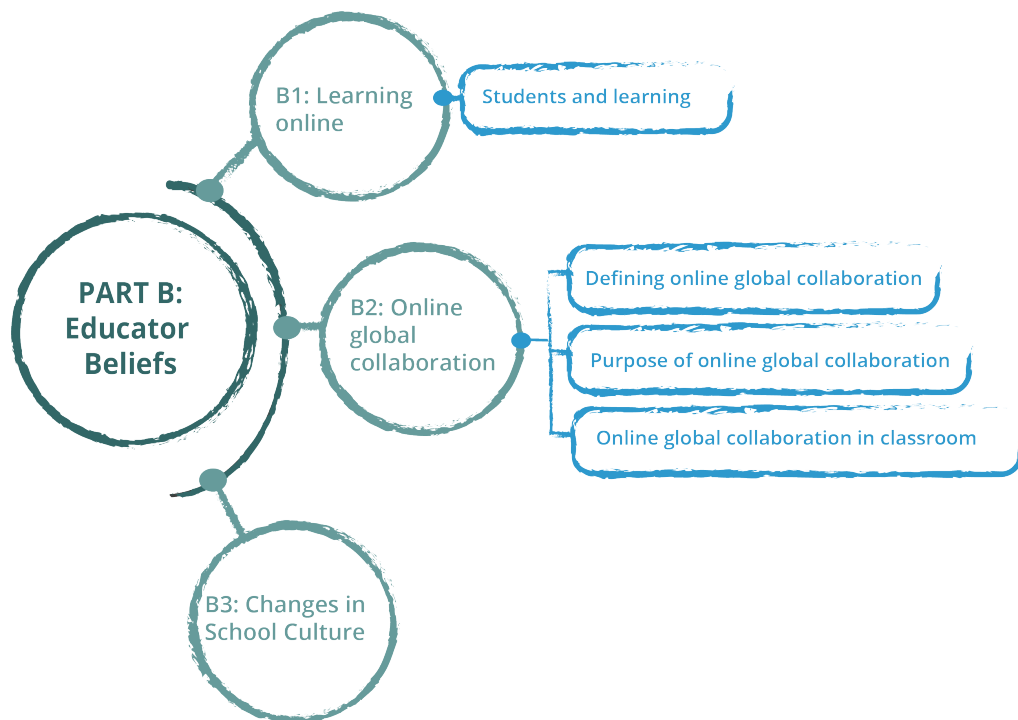

Figure A3.3: Coding schedule map Part B: Educator beliefs

Table A3.2

Codes for Part B: Educator beliefs

B - Educator Beliefs Explores attitudes towards and understanding of digital technologies while teaching and learning online and when implementing online global collaboration. Examines school culture and the ability and willingness to affect change. It aligns with research question 2 about beliefs and subsequent engagement with technology for online global collaboration.
B1. Learning online (ed_bel) In the school and classroom context educator beliefs about what online learning is, and what online collaborative learning is while using digital technologies in the classroom are explored.
B1.1 students and learning (ed_bel_stud) Identifies beliefs about student learning and autonomy when using online digital technologies.
B2. Online Global Collaboration (ed_bel_ogc) Explores attitudes and beliefs around online global collaboration in the classroom.
B2.1 defining online global collaboration (ed_bel_ogc_def) Explores educator definition of online global collaboration.
B2.2 purpose of online global collaboration (ed_bel_ogc_pur) Educators share beliefs around outcomes (including student outcomes) goals and purpose of online global collaboration in terms of their personal understandings and practices.
B2.3 online global collaboration in the classroom (ed_bel_ogc_class) Identifies educator beliefs about effectiveness of online global collaboration for their class or across different classes and scenarios.
B3. Changes in School Culture (ed_bel_cult) A key question asked of all interviewees to explore how school culture could change to accommodate online global collaboration and support intercultural understanding and other valued outcomes.

PART C Codes - Pedagogical approaches

This section explores educator pedagogical approaches to teaching and learning that complement, intersect with, reveal or exemplify online global collaborative learning modes. It aligns with sub-research question 3 and features current pedagogical practices and identifies new and emerging practices. Figure A3.4 details visually the coding schedule map for Part C, while Table A3.3 provides detailed descriptions of each code section and sub-codes within the section.
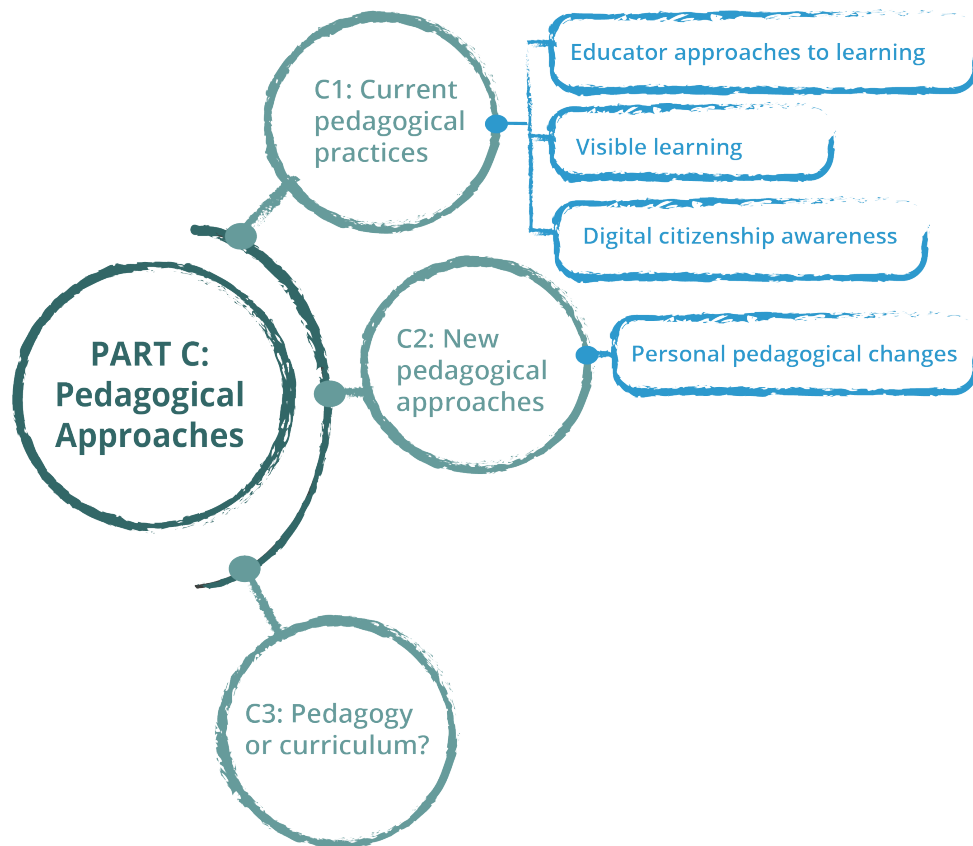

Figure A3.4: Coding schedule map Part C: Pedagogical approaches

Table A3.3

Codes for Part C: Pedagogical approaches

C - Educator Pedagogical Approaches This section explores educator approaches to teaching and learning that complement, intersect with, reveal or exemplify online global collaborative learning modes. It aligns with research question 3 and features current pedagogical practices and identifies new and emerging practices.
C1. Current pedagogical approaches (ed_ped) Identifies current pedagogical practices to do with online collaborative learning in the classroom.
C1.1 educator approaches to learning (ed_ped_ed) Identifies personal pedagogical approaches to teaching and learning in the classroom, learning collaboratively or not, with and without technology.
C1.2 visible learning (ed_ped_vis) Examines approaches in the classroom that support online learning visibility in the form of open (to at least the school community or wider) blogs, wikis and other individually or collaboratively created materials.
C1.3 digital citizenship awareness (ed_ped_dc) Identifies educator approaches to digital citizenship awareness and/or programs, including connections with parents, privacy & security concerns.
C2. New Pedagogical Approaches (ed_ped_new) Identifies new and/or emerging pedagogical approaches and changes that have taken place since the implementation of online collaborative learning. Includes educators modeling for others.
C2.1 personal pedagogical changes (ed_ped_per) Examines changes in personal teaching approaches as a result of participation in online global collaboration.
C3. Pedagogy or Curriculum? (ed_ped_curr) Is online global collaboration a pedagogy or curriculum? A key question asked of all interviewees to explore deeper understanding and beliefs around online global collaborative learning within a school context.