UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

RECURSIVE ADAPTATION AND INTERDEPENDENT COMMUNICATION: A GROUNDED APPROACH TO THE INTEGRATION OF NEW/MOBILE TECHNOLOGY AND THE K-2 TEACHER

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

DOCTOR OF PHILOSOPHY

By

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Norman, Oklahoma
2019

RECURSIVE ADAPTATION AND INTERDEPENDENT COMMUNICATION: A GROUNDED APPROACH TO THE INTEGRATION OF NEW/MOBILE TECHNOLOGY AND THE K-2 TEACHER

A DISSERTATION APPROVED BY THE
DEPARTMENT OF COMMUNICATION

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Acknowledgements

The protracted process of completing this dissertation, its conceptualization, data collection and analysis and the report itself, can be understood by reading this document. However, this external view conceals the legitimate narrative that warrants the realization of this missive. In reality, this manuscript was enabled through a network of support, conviction and long-suffering that equipped the author with an interminable reserve of inspiration, patience, faith, and mentoring. This brief description of that support can never truly uncover all the people that supported this process, but the following gives one a glimpse of the true story.

This dissertation is dedicated to my brilliant daughter Layla, who provided the "aha" moment that inspired this research, and who reminds me every day what it means to love and be loved. Galatians 5 describes longsuffering as the provision of patience in perseverance. My wife Heather exemplifies this patient perseverance and has given me her gracious support for a decade. Throughout this project, my extended family has been a personal safety net that has kept me on track, encouraging me and affirming the audacity to pursue a doctorate well into my 40's.

People, not papers rendered the path to this dissertation, and so many of them helped me arrive at this place. I will be forever grateful to my esteemed advisor, Dr. Eric Kramer, who always questions but never doubts, even when I am in doubt of myself. The support and expertise of each committee member has been invaluable to the attainment of this dissertation. Dr. Elaine Hsieh, who sets the method bar rigorously high, then helps you get over it. Dr. Amy Johnson, the first Sooner to encourage me and who never stopped. Dr. Sun Kyong Lee, subject expert and instructor of the course that impelled me toward this research. Dr. John Covaleskie, *thank you* for talking me off all of the dissertation ledges through your irreplaceable guidance. Finally, to Dr. Kae Koger, who gave me so much, but nothing more important than her trust.

I must acknowledge Dr. Stephan Rowe, who was the first to believe in me and pointed me in the right direction, Dr. Alex Nesterenko who patiently modeled for me what it meant to be a professional academic, and Dr. Corey Anton and Professor Coleen Pierson, who demonstrated I could be both “intellectual” and “fun” as an educator. A sincere thanks to my student cohorts for making me feel at home. I also have to acknowledge my “exemplars for life”, for their influence and friendship; Tim Roth, you made me believe I can change my life, Dr. Paul Nwulu, for the roadmap, and to Ken Fischer, for reminding me the value of a true friend. Finally, I would like to thank the greatest teacher that I ever had, my mother. Sure, some might say that epistemology and teleology were a little early for a 10-year old, but it looks like it finally paid off Mom.

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Abstract

The ascendency of technology in contemporary culture has catalyzed vertiginous alterations in the communication practices of individuals, groups, and organizations. The integration of new/mobile technology in educational institutions has rapidly increased over the last several years, modifying the praxis and pedagogy of educators. Additionally, teachers in the early elementary grades are encountering a first generation of students that arrive with technical expectations and skills that can match, and in some cases exceed, the skills of the early educator. This dissertation and research is an inquiry into the impact of integration of technology on the Instructional Communication practices and their ramifications to the Interpersonal Communication that undergirds the classroom stakeholders of teachers, students and parents. The research that buttresses this dissertation is designed as an exploratory and expositive examination of the impact of technology integration on K-2 teachers. These participants were chosen because they reside at the fulcrum between the nascent tech-savvy student and the institutional priorities and demands of new/mobile technology integration that influence teacher processes and practices.

This research asks three questions concerning the phenomena of integration of technology in the K-2 classroom: (a) how K-2 teachers evaluate the influence of technology on their ability to achieve desired learning objectives (b) what is the impact of technology on the teacher and their process of teaching and (c) what influence does the integration of technology have on the development of the teacher- student- parent relationship. Grounded theory methodology incorporated 3-phases data collection that included: a 70- minute initial interview,

elicited text journals and member-check interviews used to clarify and confirm findings. 28 teachers participated in the initial interview and 25 of these teachers completed the elicited text journal. 16 participants were interviewed for member-checking.

Findings include eight themes and two theoretical findings. *Recursive Identity/ Agency Adaptation* (RI/AA) describes how K-2 teachers are iteratively adapting to the integration of technology through the management of their resources and the maintenance of their identities. The grounded theory of RI/AA is discussed as an applied extension of Giddens' structuration (1979) and has implications for educational organizations, stakeholders and policy makers. RI/AA provides several points of departure for additional scholarship and theorizing. The results of the inquiry of teacher-student-parent relationship uncovered the transition to an *Interdependent Stakeholder Model* of classroom stakeholders. This result posits a transition from a tri-linear model of stakeholder communication to an integrated model that produces increased participation and accountability, richer communication, and affirmation of students through the compression of time, virtualization of space and clarification of the content and context of messages.

Chapter 1 Introduction

From our earliest moments of consciousness until the time that we close our eyes and dream each day, technology is present in our lives. As we reflect on the cultural significance of the third decade of third millennium, the presence of the technical regime has become imperceptible to us. Technology now mediates the entirety of our lives, our industry and creativity, our expression and our relationships. The convergence and progression of knowledge and technique continue their transformation at unparalleled pace, delivering us into a cultural milieu where our lives can flourish, unfettered from the complexities of rational thought, or the tedium of idle minds. Our personal technologies- the ones we call "mine" – act as our surrogate life partners. We rely on these devices to connect us to loved ones, inform us, entertain us, and guide our actions and movements.

Innovations and advancements in technology and media comprise the essential cultural capital of our contemporary epoch. The institutional implications of technology integration are witnessed by the transformation of the body politic, the enabling of myriad forms of enterprise, the preserving of our collective conscious through media, and the buttressing of our social institutions. As the pace of these technological breakthroughs accelerate, and are applied to increasingly diverse individuals, groups and institutions, the understanding of the challenges and implications that often accompany their deployment has been inadequate (Chung & Khe, 2017).

This dissertation will examine kindergarten, 1rst and 2nd grade teachers (referred to as "early educators" in this proposal), as they respond to a temporally bounded, sui generis social phenomenon. Early educators are presently situated at the emergent confluence of significant technological and media transitions that are consequential to the endogenous and normative development of students, the practice of teaching, the process of learning, and the unfolding of

the culture writ large. This study will examine how early educators integrate technology and media to achieve learning objectives and the ramifications to student-teacher relationships.

The Problematic of the Contemporary Early Educator

The contemporary teacher encounters change and transition on many fronts. Educational institutions are making the transition to the digital classroom, a learning environment that systemically integrates technology and media into curriculum and communication strategies (Livingstone, 2017). Students, the individuals that teachers must educate, embody the repercussions of technical transformation. A neoteric cohort of preschoolers now develop their cognitive abilities, social awareness, and learning patterns in the presence of; (a) diffuse mobile communication devices and platforms (i.e., smartphones and tablets), (b) saturated accessibility and use of "apps" and (c) ubiquitous penetration and speed of Wi-Fi in the home (Fatherly, 2017; Sterbenz, 2015). These young people have been provided for, nurtured, and been enculturated in a previously unknown socio-technical environment (Zevenbergen & Logan, 2008). This cohort of preschoolers, (informally referred to as "socio-techs" in this proposal), offer uncharted territory for the teacher to navigate as the seemingly incessant change of technology integration, and the ever constant priority of stakeholder relationships.

Administrators, parents and teachers are all stakeholders in the process of learning, but it is the *teachers* who are left to account for the nascent social phenomena of integrating technology in the classroom. Early educators are held accountable to the attainment of student academic benchmarks, while building strong relationships with each of their students. K-2 teachers also implement and account for the changes that technical integration can have on curriculum but in most cases, they have little stake in making integration decisions (McFarlane, 2014). Early educators socialize students with vastly different backgrounds, varying exposure to

technology and media, and a broad range of parental values regarding the purpose and role of technology in socialization and learning. It is teachers that must find the balance between diverse expectations coming from students, parents and administrators regarding the appropriate role of technology, and the pedagogic and strategic integration of technology in the classroom.

The contemporary early educator navigates social, pedagogical, and developmental concerns that produce specific and transferable knowledge in learning environments. As technical integration continues in schools, teachers will inevitably encounter continued modernization of technology. Scholarship that addresses these challenges will provide valuable practical knowledge and theoretical perspectives to early educators in similar social situations and improve their classroom practice (Livingstone, 2016). The subject of technology integration is relevant in the context of the digitization of curriculum and instructional technologies entering the classroom, but is perhaps more relevant to the enduring contingency of early education. The common denominator of competent instructional communication is the building of the relationship between the student and the teacher. Therefore, research that produces knowledge and theory about the successful building of student-teacher relationship in the context of the integration of technology will extend applicable insights and useful practice in learning environments Finally, the examination of emergent and relevant social phenomena will produce scholarship that is socially and theoretically significant for researchers and scholars alike.

Early Educators at the Fulcrum of New/Mobile Media and Technology

Technological achievements have come to define the progress of culture in the contemporary age, providing a demarcation point from which these advancements can be investigated. Innovations in medicine, communication, transportation and environmental science

stand as partial evidence of a tech-laden culture that promotes, even glorifies, technical development. Nonetheless, individuals, families and organizations have begun to face the challenges of equilibrium between the ubiquity of technology and interpersonal relationship.

Early educators face the dilemma of identifying and delivering the appropriate technical capabilities in students and finding the balance between the social and the technical in developmental environments. The provision of insufficient technology and media skills can limit opportunities and produce stigma. However, the oversaturation of technology risks the diminution of a fully actualized self. This paradox is a challenge that playing itself out in the contemporary classroom. Within educational institutions, the proponents of technological integration are persuaded by the criterion of, "provision of life skills" and "relevant teaching" (McFarlane, 2015). However, traditionalists identify a technological incommensurability that arises where the use of technology is detrimental to the benefits of traditional learning **(**McFarlane, 2011). Presently, early educators are compelled to act as normative guides for their students, pointing to the appropriate use of media and providing introductory media literacy skills to students with diverse backgrounds. Achieving this balance complicated by the differences in parental expectations regarding instructional technology (Heintz & Wartella, 2012). As teachers continue to seek the equilibrium of technology in the classroom, educational institutions have converged on the deployment of technology to emphasize their relevance and efficiency.

Teachers face a prioritization of efficiency and commodification in educational institutions as they integrate technology and foster authentic student relationship. Class size, student testing, teacher assessment and other efforts have centered on the efficient delivery of students to, and through, the educational institution. Under the conditions of commodification

and efficiency, educational institutions are necessarily more inclined toward technological integration (Lyotard, 1979). An "inevitability" argument concerning software and media is common. Scholars such as Leu (2013) and Steckel, Shinas, and Verenewyck (2015) indicate that the incorporation of technology in schools is a predictable outcome and that technological integration and curriculum should be expected given such conditions, "because technology is now ubiquitous in the developed world, children read, write, and learn in ways not imagined just two decades ago" (p. 42). Fundamental revisions in educational goals have had a profound effect on learning and relationships because, "it changes the way we learn and also carries the potential to change the way we teach" (McFarlane, 2014, p. 7). Technology is viewed as a means to employ greater efficiency in the system and teachers are called upon to achieve these objectives.

The integration of technology in public schools hinges on two related factors: (a) the achievement of learning objectives and (b) the successful development of the student/teacher relationship. The proposed study seeks to understand these factors, and how they are related, by examining the point from which they emanate, the teacher. The early educator makes instructional communication decisions about the technology that will be used in their lesson plans and what media will be incorporated into classroom learning. These efforts are contingent on interpersonal communication strategies as teachers go about building trust and empathy with the nascent student, who is looking for the comfort of a surrogate. This study will inquire how, and in what ways, the vertiginous changes in our technical development influence instructional communication and the interpersonal communication between teachers and students.

The Transformation of Educational Stakeholders

This dissertation examines the process of early educators and their evaluations of technology. In order to consider the contemporary teacher, their ability to inculcate learning and

develop relationships with students, it becomes both advantageous and responsible to gain an understanding of the students that teachers seek to serve. A brief inventory of the contemporary student that populates the classroom of K-2 educators will illuminate the problematic.

It is difficult to "zoom out" of one's own culture in order to observe the changes that occur in real time. However, there is credible evidence to suggest that a significant stage in the transition from the visual age, to and through the digital age, is well underway. Scholars predicted that the "digital native" cohort would provoke significant repercussions on culture and scholarship (Prensky, 2001). Though disputed by academics, popular theories of generational cohorts provide heuristic value to the comprehension of cultural change. It would be safe to say that the "conceptualization" of the digital native has reoriented social structures and their impact has rippled through the culture, changing suppositions about how generational cohorts communicative with one another. The digital native premised a fundamental shift in the technology through which this cohort could experience the world. This supposition is evident in the moniker- the "digital" native. The second word, "native" indicates that was inherent in the manner that the cohort experienced the world. With the advent of 4G, smartphones and tablets, and the geometric progression of corresponding applications, as well as Wi-Fi speeds and penetration, the conditions for a significant new cohort are possible. If this cohort will be lionized as a cultural icon is not relevant to this study. However, their shared experience and the assumptions they carry into the classroom *are* of significance to the early educators who are responsible to prepare them for society.

Socio-techs have experienced an exponential escalation in access to media content at increasingly younger ages, and they spend more time with ICT's than any generational cohort that has come before them. Within the context of the ascendency of the media and information

culture, the access of technology to children has been unprecedented (Reinecke & Eden, 2017). Some of the earliest socialization experiences for children are now mediated, and learning often becomes a technology-based iteration at ages as early as 18 months or less. Repetitive exposure to entertainment applications, learning applications and visual media through the use of tablets and smartphones is simply unprecedented. The technology/devices that carry the media/apps are a new phenomenon for parents and their device ownership permits this exposure to occur (Killdare & Middlemiss, 2017).

In 2013, a research report examined extant literature in the early adoption of technology and determined "it may be concluded that young children quickly become competent users of tablets being able to successfully navigate through the interface by touching and interpreting printed words, letters, icons and symbols" (Neumann & Neumann, 2013, p. 237). Socio-techs are experiencing a life with nearly universal connectivity, access to mediated communication and the availability of applications at any point in their lives. According to Pew Research, smartphones could be found in 60% of preschooler homes by 2014 and today, smartphones are in 90% of homes of children who have parents that are younger that 50 (Pew, 2018). Preschooler media access is compounded by the advent of tablets, which topped 50% saturation for American individuals by 2016, and now exceed 68% (Pew, 2018). Perhaps the most revealing statistic that provides insight into the inquiry into the world of the socio-tech is the fact that the *median* American home has five (5) smart devices with a third of households having at least three smartphones. In a country with negative population growth and "dramatic decline in large families", it is no surprise that preschoolers have broad access to smart devices at high levels of use (Olmstead, 2017).

The second of educational stakeholders in this study are the teachers themselves. Early educators encounter several challenges including; (a) the anomic turnover of technology (b) discordant expectations for benchmarks in development of their students and (c) the responsibility of setting precedence for media literacy. Despite having all the technical tools that many teachers have at their command, and the eye-candy of media use, the heart of the teacher in the contemporary classroom has remained constant as the relationship that teachers develop with students. The study at hand is interested in understanding the manner in which teachers balance their job descriptions of attaining their learning objectives, and the assumed and perhaps more important achievement of gaining the trust and love of their students. In the context of this study, Zevenbergen and Logan (2008) provide a framing that highlights the importance of reaching socio-techs in that, "there is a need for early childhood providers to be acutely aware of the differences in the access of families and children to these technologies, which may be creating the potential for considerable differences in skill development and very different learning opportunities for children" (p. 43). As technology is integrated and diversity is widened, relationship becomes more critical as a foundation for learning.

The final stakeholder in the study can be considered ancillary, but parents are of critical importance to the success of students and the phenomena this dissertation proposes to study. The parents of socio-techs entrust their children to teachers who are responsible for the socio-tech they send off to school each day. Technology and media have always been an issue between parents and children (I remember hiding that transistor radio under my sheets before I went to bed at night). Nonetheless, the development of digital technology, ICT's, and mobile media has transformed home life. The convergence and development of technology and media has ramifications to the hierarchy of parents and children, who often have equal access and

knowledge about media devices and children often have superior knowledge in the management of preferences and usage patterns (Nuemann & Nuemann, 2013). This particular "democratization" of technology and media have made anachronistic care-takers of parents and confused the roles that some family members navigate in the home.

Contexts of the Study

There are three relevant technological contexts of the dissertation that help to frame this study: (a) nascent media ecologies, (b) families and media, and (c) the integration of technology in learning environments.

Media ecology is a perspective in technology and media studies that in its simplest form is, "the study of media as environments" (Postman, 1970). Neil Postman was a pedagogist who posited media ecology to unify perspectives of media theory put forth by eminent scholars such as; McLuhan (1964), Ong (1982), Innis (1954), Ellul, (1964), Mumford (1934) and others. Postman & Wiengarter (1969) would go on to explain that media had an effect on "human perception, understanding, feeling, and value" (p.161). The summative and iterative effects of media, Postman concluded, constituted an ecology because, "it implies the study of environments: their structure, content, and impact on people" (p. 161). The proposed dissertation examines the context of the ecology of media in schools through teacher practice. This framing should not be mistaken as the theoretical grounding of the study. Instead, media ecology constitutes the ontological assumption of the researcher and therefore, of the research that will be produced. Media ecology describes the conditions under which technology and the media of communication contribute to both conditions of opportunity and difficulty in the ecosystem of culture. Postman (1983) describes the motivation of the perspective; "We put the word 'media' in the front of the word 'ecology' to suggest that we were not simply interested in media, but in

the ways in which the interaction between media and human beings gives a culture its character and, one might say, helps a culture to maintain symbolic balance" (qtd. In Strate, 2004).

The second context that informs and frames this dissertation is the perspective of *technology, families and media*. Families face a myriad of issues that were unimagined just two generations ago, which have been brought about and exacerbated by the precipitous ascendency of technology and mediated communication. These challenges are visited on the teacher and classroom as students make the transition to school. Families use technology to stay connected and monitor each other's movements when are apart from one another (Olmstead, 2013). Students can bring these expectations of connectivity to the classroom and cause discordant views about technology. The social environment of homes and families extend to the youngest of family members and relevant information about the benefits and appropriate use of technology is often scarce. Hienz & Wartella (2012) identify "from print media through screen media (television, computers) to mobile technologies (iPods, tablets, cell phones), American children increasingly live in homes that enable them to have media as part of their lives during nearly all of their waking hours" (p. 22). In stark relief of the domestic environment for preschoolers, the schoolroom is a place where a distinct agenda is managed by teachers that are accountable to justify the use of media and technology against learning objectives, standardized assessments and organizational hierarchies.

The final context of this study is the integration of technology in learning environments. ICT's have enabled forms of classroom practice through "a re-appropriation of space, interaction and engagement." (McFarlane, 2014, p. 17). The question of the applicability of this study is answered by the penetration that technology has already achieved in public schools. A 2017 survey conducted by TES global revealed that 84% of teachers regularly incorporate technology

into their lesson plans, and 90% utilize computers to achieve learning objectives (TES, 2017). In addition, the trajectory of implementation of technology in schools is exponential. In 2010, 3,000,000 laptops, tablets and notebooks were shipped to K-12 public schools in the United States. By 2017, that number had reached 14,000,000 with 16,000,000 forecast in 2018. For the years 2015-2018, 57,000,000,000 laptops and tablets will have been shipped to public schools in America (Education Week, 2017). Finally, the demand from teachers and students for additional technology in classrooms continues to rise. 67% of public school teachers are asking for more technology today and only 1 in 5 teachers are satisfied with the level of technology in their classes. Technology is now firmly entrenched in educational institutions and in the attitudes of educators.

The Importance of This Exploratory Study

The geometric progression of technology and media throughout society has penetrated the practice of the contemporary early educator. The integration of technology in schools is intended to offer utility and practice to the early educated, however, "when young people turn to their parents . . . many [parents] lack the skills and knowledge to help their children with these types of issues" (Wauters, Lievens, & Valcke, 2015, p. 363). As a result, early education environments act as the normative social structure in contemporary culture that instill in children the capabilities, limitations and appropriate use of media and technology. Correspondingly, educational institutions are completing a transition of incorporating technology, media, applications, and software that will aid educators with teaching and learning objectives. Finally, teachers lie at the axis of the innovation of technology integration and the consistent need to build relationships with students.

Given the confluence of the social dynamics explored, a distinct and consequential phenomenon is now occurring in the early education classroom that demands academic inquiry. The proposed research will provide an exploratory account that produces a grounded theory of the social situation. The following research questions and method will center on two aspects of the phenomenon: (a) the instructional communication/pedagogical implications, and (b) the interpersonal ramifications on student-teacher-parent relationships. The following research questions will guide the proposed research and method:

Research Questions

RQ1: How does the teacher evaluate the influence of increased availability and use of new/mobile technology and media in their ability to achieve desired leaning objectives?

RQ2: In what ways does the integration of new/mobile technology and media influence the teacher and the process of the teaching?

RQ 3 -A In what ways does the integration of new/mobile technology and media influence the development of the student/teacher/parent relationship?

Choosing the method for addressing these research questions entails two criterion; (a) the ability to qualify the teacher's perceptions and knowledge regarding this issue and (b) an applicability of examining processes and questions of "how" in social situations. The implications of the first criteria indicate a qualitative research approach. The second criterion indicates Grounded Theory Methodology as an appropriate means to generate theory from data

and analysis. The proposed research will follow qualitative research assumptions that include the ontological groundings of constructivist traditions.

Employing a qualitative social constructivist approach is particularly beneficial to the problematic of the proposed study. Early educators constitute a distinct social world and are keenly attune to understanding and describing experiences. Qualitative research often relies on language and writing to access the data that qualitative methods utilize and these skills are almost certain to appear on early educators job descriptions. Constructivist research is most successful where there is a sense of the exteriority of the other and where, "a social unit jointly constructs meaning" (Leeds- Hurwitz, 2006, p. 231). Hurwitz offers an apt description of the student-teacher relationship that the study seeks to elucidate.

The data collection method will primarily consist of interviews and be supplemented by elicited texts. These methods of data collection are suitable for teachers that compromise a group accustom to creating written reports of their experiences and who often set aside time each day to reflect, grade, and manage communications. Methodologists have discussed the limitations of self-report strategies for data collection in qualitative study. However, given the sensitivity of the relationship between students and teachers, and the legal issues surrounding research with school children, interviews and self-report strategies offer a meaningful way to collect relevant data that might otherwise be difficult to access.

Grounded Theory Method is an ideal qualitative method for the examinations of processes and relationships (Hood, 2007). This proposed study sets out to explain how the processes that early educators employ achieve learning objectives through relationships with nascent students. The "theory" that GTM produces can be described as a "sensitizing subject" that operates as a connective abstract between data and theory. Thus, this study will use

theoretical sampling within the group of teachers and employ a constant comparative method to produce theory that makes "sense" of the data emerging from early educators process of teaching and relating to students.

The research questions represent the two aspects the study seeks to answer. However, rather than examine these as separate characteristics in data collection, semi-structured interviews will use techniques that allow the researcher to pursue these connections where they organically reside rather than attempting to linearly prompt teacher experiences. The approach to data collection has implications for interview techniques that will seek to identify actions and perceptions of actions, rather than evaluative questions.

The proposed research is expected to produce practical and academic usefulness on several accounts. The research will add to extant literature by providing a descriptive and exploratory account of a new social condition that is relevant to the culture where it operates. Exploratory accounts are considered vital where new social conditions are established (Kothari, 2006). In addition to scholarly value, the proposed study inherently addresses issues of social significance. In addition to the education of the next generation of citizens, the relationship that teachers have with students and the technology that young people currently utilize, presage further applications in families, vocational training and higher education research. As Livingston and Brake (2010) called for, "research must keep up to date with children and young people's social practices . . . as their future uses of this technology may, as so often before, still surprise us" (p. 80). Given the age of technological ubiquity, the proposed research can advance the understanding of instructional communication. Finally, the production of a grounded theory that addresses the problematic will inform and contextualize research that examines; standards of practice, criteria for policy formation, and media literacy among other areas of interest.

The proposed research has the capability to contribute to the structure of teaching and technology that underpins successful teacher-student relationship. The knowledge and theory produced by the study can also assist those who set future policy and use patterns for media and technology in schools. Finally, as technology and media continue to be deployed in schools, additional knowledge of the connection between technology, learning and student-teacher relationship can assist teachers and administrators in selecting appropriate resources. Fullan and Donnely (2013) explain the difficulty in choosing between resources as, "the digital landscape confronting teachers, teacher educators, policy makers, designers and those who would sell products and services to education is something of a minefield" (McFarlane, 2014, p. 10). Early educators quietly and consistently do an amazing job adjusting to vertiginous change in an anomic culture. Teachers are expected to manage a myriad of pedagogical, logistical and relational responsibilities, while they are acting as the caretakers of our most precious national asset. The time has come to listen to them. Garnering greater understanding of the processes that teachers undertake to execute their work, the manner in which they experience it, and the inner-workings of their critical relationship with students, is both academically useful and socially relevant. The utilization of grounded theory methodology will provide a theoretical basis for understanding the processes that buttress teacher's relationships with students and technology, and produce valuable and applicable grounds for further research. Subsequent chapters will provide additional background, a review of extant literature, methodology, findings and a discussion of research implications.

Chapter 2 Sociocultural Background of the Study

Understanding the American Early Educator.

Teachers in Kindergarten, 1rst and 2nd grade comprise a distinct group of educators. In early student experiences, socialization and personal relationship are prerequisites to learning success. The individuals that become early educators require specialized training and must be able to combine social and technical skills in a dynamic and complex work environment. The relationship that teachers have with technology can be challenging. Teachers are required to manage pedagogic, social, interpersonal and political implications of technological integration and coordinate satisfy a diverse set of stakeholders.

In some learning environments, early educators control their own technology and media choices. More often, educational institutions will set priorities and policies for technology and media, or select hardware, software or ICT's (Hollands, & Saxberg, 2017). The teacher must then account for their students' diversity of capabilities, readiness, and valence toward technology as they apply ICT's or applications in the classroom. These pressures place the early educator squarely between: (a) the priorities, commitments, and expectations of administrators who envision the successful homogeneous application of technology and (b) the diversity of exposure, technical skills, value positions and intentionality that entering students hold toward technology. Thus, early educators are required to perform their jobs in order to attain a duality of success. Teachers must meet the benchmarks and expectations of their hierarchies, while meeting the demands of student relationship and community.

Educational approaches to pedagogy have a history of change and transition. The curriculum, physical classroom, learning resources and objectives have all undergone revision and review (Muir-Herzig, 2004). However, there is one constant that has not changed, and it

remains the preeminent fundamental for early educators. The importance of the relationship between students and teachers cannot be understated (Taylor, 2017; Paley, 1992). Educational exemplars share the position that a vital prerequisite to teaching is play and friendship. In turn, play and friendship builds trust and relationship. The relationship between teachers and students is fundamental to the successful socialization of the student, and the shared experience of building community portents the ability of students to form friendships with their cohorts.

Early educators model socialization for students through the experience of group interaction. Guided exposure to the Other provides students a safe environment to transition from home to school. The relationships that teachers have with one another illustrate community-building behavior, and regular communication between teachers gives consistency of purpose to the curriculum. Finally, this socialization and relationship building is achieved through play. Though engagement with ideas and otherness, students learn to comfortably step outside the protection of their families and step into a diverse world. As Meier (1995) stresses, "The capacity to see the world as others might is central to unsentimental compassion and at the root of both intellectual skepticism and empathy" (Meier, 1995, p. 64). The schoolhouse acts not only as a place for the transition of knowledge transition, but where young people learn to embrace their own sense of personhood, and those of others. As advancements in technology flood schools with ICT's, applications, and technology dependent curriculum, the question arises to whether the perquisite of relationship remains unchanged?

Technology requires early educators to be adaptable and attentive implementers and the introduction of (ICT's) have enabled new forms of pedagogy. McFarlane (2014) explains that:

> This is apparent in three particular respects: (1) the reconfiguration of space such that new patterns of mobility, flexible working and activity management can occur; (2) new

> ways in which class activities can be triggered, orchestrated and monitored; (3) new experiences associated with the virtualisation of established and routine practices - such as us. (McFarlane, 2014, p. 17)

Technology and media have changed the way early educators conceptualize and execute their professions. Teachers are able to respond to the dynamic social demands of students through a well-developed sensitivity to the psychosocial factors nascent students confront. How will technology and media influence these interventions? Technology has proven to improve efficiency and resource management in many sectors. How will educational institutions and teachers translate that success to their classrooms? Like all individuals in groups, teacher's attitudes are diverse. Nonetheless, educators set aside their personal positions to instruct students with a unified curriculum and technology policy. Professional constraints can be discordant with early educators teaching philosophies and personal attitudes. The incorporation of technical apparatus and tech-dependent programs may conflict or concur with instructor views on the epistemological and ontological legitimacy of technology in education.

Teachers act as normative agents for the inculcation of policy and legitimation of technology and media use for their students. Teachers have always acted as our cultural mentors, because "we must be told when we are young, what rules to live by early in life so that myth and morality proclaim the same message while the children are still listening"(Paley, 1992, 941-942). As discussed, the teacher is often the first authority figure to: (a) impose consistent technology and media usage and time constraints for the cohort of students and (b) communicate formal policy pertaining to technology and media. At a minimum, the iterative exposure to technological use structure instills norms and social expectations in students and act as the basis of value judgments. Students learn from their teachers the forms of technology and media that

are acceptable to use in which cultural settings. Over time, students form cognitive and social patterns that set precedence and practice for the future use of technology and media inside and outside of the classroom. Students temperament toward adults, work-life, and the public sphere are formed "on the basis of schools " where they model "social rules, order and etiquette" (Meier, 1995, p. 292). Nonetheless, the responsibility of normative agency may not be as "front of mind" as the social issues and inequities that teachers navigate in the classroom.

Early educators are the benefactors and caretakers of diversity in their classrooms. These concerns can influence educators teaching practice. Socio-economic diversity and family diversity are of upmost importance to educators. However, as teachers integrate technology in the classroom, several challenges emerge. Foremost among these is the digital gap – or the difference in access to ICT's and/or Wi-Fi access or speed that enables ICT use. Teachers must assume that some students will have little prior experience with technology or the ability to use applications and account for these differences in the sequence of teaching and accommodations. Variance in student experience with educational applications and student preferences for media type contribute to differences in attitudes and values toward technology and complicate teacher efforts to manage the digital divide. This proposal and extant literature suggests the emergence of a "mobile gap". The mobile gap highlights; (a) the difference in expectation toward the integration of technology as assumed and integral to the social environment and (b) the form and speed in which communication occurs. Technological diversity complicates the myriad of social issues that early educators confront with every new group they instruct.

In, *No Sense of Place: The Impact of Electronic Media on Social Behavior*, Joseph Meyrowitz (1986) describes how media and technology transform the social order through a reorienting of the basis of the social actors experience; "Media has changed the logic of the

social order by restructuring the relationship between physical place and social space by altering the ways in which we transmit and receive social information" (Meyrowitz, 1986, Kindle Location No. 6936). As technology continues to be integrated in schools and is normalized as a teaching and learning resource, how will the relationship between the teacher and student change? In what ways does technology and media open up new ways of comprehending the world? In what ways does technology conceal critical human values, and how might it reorient our ethics? Questions about technology and media can be drowned out by the cacophony of adoration over incredible innovations in efficiency that technology presents. The proposed dissertation and study addresses these dynamics by taking the time to listen to practitioners who are on the front line of the normative social-technical domain.

Understanding Approaches to Technology Integration and Control in Educational Settings

The use of technology and media in schools is not a new phenomenon. Debate over what kind of books can be used in schools has been going on since the trivium. Each new technology, and the content it catalyzed, fostered internal debate over its educational value, and external squabbling over its moral or cultural appropriateness. Though the debates themselves do not have direct bearing on teachers, the outcomes of policy become another external decision that teachers must implement in their classroom. This is not a new experience for teachers. The radio, the film-strip (remember those), 16mm films and eventually televisions-on-wheels all took their turn in the American classroom and facilitated learning (and bathroom breaks). However, two innovations provide the footing for contemporary debates about educational technology and the unprecedented integration of technology into the curriculum: (a) the affordable computer and (b) the widespread availability of (ICT's). "The ubiquity of technology is a prima facie fact of modern life that has transformed our institutions, including our schools" (Zeoli, 2017a, p. 6).

Technology has now become the manner in which we experience reality and it provides the basis for an instrumental efficiency that has accompanied its penetration. The ascendency of technology and media has "changed . . the fabric of society itself, through the impact on how we communicate with and thus relate to each other" (McFarlane, 2014, p. 7).

The integration of technology in educational institutions is complicated by a diversity of implementation levels. Some schools have minimal integration and even *prohibit* students from possessing technical devices and other schools *require* devices that have integrated software and built-in curriculum. Schools that prohibit any use of technology are quickly becoming the unicorn of the school technology dialogue. Proponents and technological "compatibilists" believe the benefit of technology in education is evidenced by the capability of students to express themselves, and in the improvement of efficiencies in production of labor, information management, and networks (McFarlane, 2014). Software and applications offer students new methods to create, learn and widen their view of the world through exposure to cultures other than their own. Advocates of technology and media in schools claim that new forms of community and connectivity have been brought about through the comfort and flexibility of convenience and increased the ability of students to engage with curriculum.

Proponents of technological integration cite the improvement of the lives of people though advances in technology and assume that learning is an inevitable outcome of the dissemination of technology. Rodgers Diffusions of Innovations theory (1995), posits that, as technology continues to advance it will benefit everyone. Students, teachers and educational institutions are no exception. Rodgers (1995) theory is only one scholarly basis for the legitimation of technology in schools. Other extant theories have been employed to support the benefits of technological integration media in education including: (a) Social Presence Theory

(Short, Williams, & Christle, 1976), Adaptive Structuration (Poole & DeSanctis, 1994) and Media Richness Theory (Daft & Lengel, 1984).

The integration of technology in schools is already at an advanced stage (see literature review). In some preschools, students are given a computer tablet that mediates learning and communication. Other teaching environments have less integration, and still others have made the move to a fully online school. There are also schools that have rejected the integration of technology due to resource and logistical limitations and still others that reject the technological mandate altogether. Though reductionist, this debate can be reduced to a division between a software based, learner-centric model and a traditional model of learning. Despite the diversity of application, there is a sense of inevitability that schools are fully on the path to a technological future. The course of that future has begun to take shape.

The implementation of technology in schools can be said to have three broad categories of integration; "(a) The traditional classroom that uses little or no technology (b) the online/virtual classroom that exists only as a result of "meeting" online in a virtual space and (c) the digital classroom- a physical classroom that incorporates technology as a principal means for learning" (Zeoli, 2017a, p 23). Despite the success of online schools in deeply rural areas and in some urban pockets, the clear winner in this competition has been the digital classroom. The characteristics of the digital classroom include; (a) a physical learning space that incorporates technology and media for the transmission of knowledge (b) the inclusion of technical devices in learning strategies and (c) the integration of media and technology to catalyze communication between faculty, students and administrators.

These definitions reflect the variance of integration and commitment in the conversion from the analog to digital environments. It should be noted that digital classroom exhibit a wide

variety in the degree to which each criterion are present in the learning environment. However, for the purposes of the proposed study and the selection of sites and participants for data collection, the digital classroom will be defined as: (a) a school room that is a physical space where (b) teachers and learners intentionally use technical means and mediation to convey learning objectives, and participate in educational goals and curriculum and where (c) technology and media are utilized for classroom management and community building.

Evaluations of the benefits of technology in the classroom are a diverse as the pedagogical positions on their integration. Teachers cite improved attention, relevance and motivation and two-thirds of public school teachers regularly incorporate the use of technology or media into their lesson plans (Murray, 2012). Almost 70% of teachers are asking for more technology and this trend continues upward year after year (Bolkan, 2017). Though satisfaction, attention, ease of use, and interest are peaked, there is no data to suggest that technology increase test outcomes. McFarlane (2011) notes:

> There has been no well-established correlation to achievement. Most importantly, those who are less than supportive of technology in school point to the fact that there has been no link established to the Holy Grail of public school evaluation, test scores.
>
> (McFarlane, 2011)

Nonetheless, several advantages were identified including the efficient management of information, an increased ability of students to communicate and an increased connectivity between teachers, parents and students. These advantages and challenges "became ossified as more and more school systems adopted technology for their schools and classrooms" (Zeoli, 2017a, p.16)

Mixed results in the data have continued to push researchers for additional answers. Advocates claim that steps can be taken in digital environments so that, "all instructional decision making [is] grounded in the experiences children need in order to become effective readers, writers, listeners, and speakers" (Steckel, Shinas, & Verenewyck, 2015, p. 42). Given the commitment to integration of technology in the classroom, the question that must be accounted for, in the context of the proposed study and other research is how teachers achieve learning objectives through media and technology.

Teachers and administrators know there is demand for technology in the classroom, but have less understanding of what will deliver on the demand of learning objectives and standardized tests. In this context, there is a race to identify and compete for the "best" model/software/program that can fit the needs of educators. An example of a successful model is "artistic technology integration" (Steckel, Shinas, & Verenewyck, 2015). This integration model takes a pragmatic approach to technology in a tech neutral environment where media implementation is only utilized under certain criteria. (Steckel, Shinas, & Verenewyck, 2015) found that artistic technology integration assesses the developmental and cognitive appropriateness of any potential technology and legitimates their use through an evaluation of potential achievement goals prior and detriments prior to their implementation.

Early educators face technical, relational and pedagogical deliberations as they integrate technology in their classrooms. They act as normative agents, technicians, educational curriculum experts, child psychologists and oh yeah….teachers. There is a consistent trajectory toward more technology and more media in schools. As integration continues, early educators strive to identify the best way to serve their students. To this end, the proposed research seeks to identify a theory of technology integration that may have transferable value in similar

pedagogical environments. In order to evaluate the specificity of extant technology, background on the technological landscape can assist in illuminating this subject.

The Technical Landscape: Meaning and Identity

Technology has transformed the lives of those living in the third millennium. Today we live longer, get there faster, connect better, and create more. The use of technology has become the fabric of our social lives, connecting our messages through mediums. Yet every message needs a medium and each medium is defined by the messages they carry. In order to understand the socio-cultural environment in which teachers practice their trade, and the implications of the process they must utilize when integrating technology to achieve learning objectives in their students, an analysis of the medium-message dynamic will be beneficial. In *Teaching as a Subversive Activity*, Postman and Wiengarter (1969) address the implications of message and mediums:

> Simply said: there is no learning without a learner. And there is no meaning without a meaning-maker. In order to survive in a world of rapid change there is nothing more worth knowing, for any of us, than the continuing process of how to make viable meanings. (p. 70)

The equation of *messages*, being transmitted through *mediums*, to create *meaning* is missing something fundamental here– us! *We* are the *knowers* that Postman and Wiengarter identify, and the *process* that they reference is *communication*.

Communication is a method to share meaning, and technology catalyzes and enables that meaning in our lives. Technology lies at the center of communication in our culture, enabling capacious meaning-making and facilitating the formation of identities through connectivity. Technology and media hold great power as a conduit to the self and to others. New/mobile media

commands a new conception of this reality and presents us with a series of questions about meaning, identity and socialization; what does technology do to the meaning-making processes? In what ways does the social enablement of technology change our culture and personhood? Is our identity formation and meaning-making conditional to technology and media? If so, what are the implications and consequences of our use of media? Finally, how does the introduction of new media and mobile technology presage the contemporary learning environment and what influence do they have on the development of student/teacher relationships? These queries are too broad to function as research questions, but addressing them can inform an inquiry into the processes that contemporary teachers perform. Technology and communication have proven to be concomitant in the 21rst century. As a result, technology and media have changed the manner in which people come to understand the world. The material effects of technology have been overwhelmingly significant to the development of human existence. However, the social ramifications of technology are intrinsic to the human experience and provide perspective to the value of our human condition. This study will consider the precipitous infusion of technology into the social and cultural framework and the socio-material implications to teacher-student relationships and the process of early education.

Meyrowitz (1984) proposes a perspective on the confluence of the technical/material and the social as a foundation for understanding the human experience. The social situation, and performances that constitute the social, "may be changed by the introduction of new media of communication" (p. 7). Concomitantly, interactions that provide the basis of relationship and learning are altered as, "patterns of information flow" provide parameters for the "nature of the interaction' (p.163). When we learn, we encounter information that is not vacuous. Instead, the information and knowledge in the classroom is grounded in a "social experience", in other

words, what children learn is inseparable from "all that people are capable of knowing about the behavior and actions of themselves and others" (p. 37). Technology and media provide a base of knowledge that is perceived by the stakeholders of the learning environment. The time of bounded reality and circumscribed knowledge has passed.

The consequences of an ever-increasing implementation of technology in our culture are a two-tailed proposition. A positive valence toward technology is the dominant perspective in our current society, as efficiency, comfort and leisure have become radically enhanced. Thanks to Bacon's *New Atlantis*, written in 1627, a positive valence toward technology would carry well into the industrial revolution (Bacon, 2010). Medicine, transportation, mediated communication, entertainment, and mating have been transmogrified and even just imagining giving up these advancements seems unthinkable. These "outputs" of the technological society have delivered on the promise of an ontological and historical trajectory that have roots as far back as the Enlightenment. We can understand these attitudes not only as a result of the respite from labor that technology has wrought, but also as the unification of the scientific temperament and technological attitude. Lyotard (1979) regarded the "blossoming of techniques and technology" as symptomatic of a pandemic scientific disposition, and an illustration of a cultural repositioning from outcomes to processes or "from the ends of action to its means" (p. 37). Neil Postman (1993) adds that this transition can be traced to the historical period of industrialization where, ". . .there developed a profound belief in all the principles through which invention succeeds: objectivity, efficiency, expertise, standardization, measurement and progress" (p. 42). The background of technological expansion includes perspectives on the conditional or detrimental aspects of integration of media and technology. The remainder of this socio-cultural context section will explore these accounts.

Inquiry meant to examine the potentially detrimental aspects of advancements in technology can be seen in every age of human history. Aristotle's four causes delineates between; (a) the distinction between natural elements and their intrinsic final cause, and (b) the material and formal cause that are necessary for technology to realize its promise of progress (Anton, 2011). Contemporary critique of technology can be said to originate in the social sciences and corresponds to the popularity and saturation of the telegraph, which had entered service in the 1830's and was commonly available by the 1860's. McLuhan's (1964) four ages of media theory provide a demarcation point of media and technology critique correlating to transition from his "print" or visual age into the "electronic" age, with the birth of the telegraph (p. 88). Analysis and critique of technology accumulated as changes to social life transpired. Durkheim's (2006) anomie, the disintegration of social bonds between the individual and the culture, was published in 1897, and acts as a significant marker in the analysis of rapid economic and technical advancements and their human consequence. Academic scholarship on technology would continue over the next several decades as technology and media proliferated throughout culture, and communication channels increased their penetration and influence across the world. Countless scholars offer perspectives and critiques on the influence that technology and media have on our interaction and social environment. These emanate from several fields and disciplines including: sociology (Mumford, 1934), philosophy, Heidegger, 1932, (as cited in Blitz, 2010), history, (Innis, 1964), communication (Kramer, 1997), and literature (Huxley,1932). Two perspectives are explored further in this background to inform the process of learning in early education, and the relationship between teachers and students, respectively: performativity (Lyotard, 1979) and multi-phrenia (Gergen, 1991).

Scholars have offered unique monikers for the era we are currently traversing. This time period has been described as: "technological age", "post-modernity", "modernity" or "millennial". There are many conceptions of the current era are based on critique of technology and media and their power to transform the legitimation of knowledge and experience. Jean-Francois Lyotard's (1979) critique on technology and knowledge posits that as technology becomes the avenue through which we experience knowledge and culture, that institutions will necessarily become more powerful and an ethos legitimated upon efficiency will replace a normative ethos predicated on the grand-narratives of faith and family. Lyotard's (1979) conception of the "performative" can be defined as a cultural ideal characterized by maximization and efficiency that is "redefining the norms of life" (p. 64) and "excludes in principle, any metaphysical discourse" (p. 62).

Technology is the apparatus through which Lyotard (1979) proposes the performative transition. Because of its material nature, technology in and of itself does not have the power to promote social change because, "technology pertains . . . not to the true, the just or the aesthetic", but is only measured by efficiency (p. 44). This hyper-pragmatism is seen in the claims of online school success, because of user satisfaction and convenience, rather than achievement scores (McFarlane, 2014). An educational paradox can be brought about because of the failure of what Lyotard (1979) deemed the "rule of adequation" (p. 24). Throughout the course of modernity, knowledge has been premised upon the idea that "What I say is true because I prove that it is" - the challenge in the technological era becomes, "what proof is there that my proof is true?" (p. 24). Thus, truth and reality are no longer tied to knowledge, but instead to the *proof* of knowledge. "Not: I can prove something because reality is the way I say it is; But: as long as I can produce proof, it is permissible to think that reality is the way I say it is. (p. 24). As learning

environments become increasingly centered on achievement tests and the process of "doing", the myopic focus on performance may wither the basis upon which the performance is measure.

Some theorists see direct detrimental effects in the deployment of digital technology to education. Anton (2011) indicates the integration of technology can bring about a reading atrophy in students and a temporal bias toward truncated text. The introduction of spoken word technology, e-books and e-readers have increased dependency on technology and media for learning and students come to lack the motivation and readiness they need to succeed (Anton, 2011). Carr (2011) offers the "shallow effect" as a side –effect of Internet usage. The shallow effect suppresses student's cognitive abilities and long-tern cognitive processes and is associated with over use of mediated learning. Lyotard (1979) posits that in the technical milieu, the role of education becomes the "optimal contribution to the performativity of the social system. Whether or not the dystopian positions of Lyotard, Anton and Carr are accurate descriptions of schools, the saturation of information in the early third millennium is certain. Research that can identify best practices, balanced approaches to media integration at an early point in intervention can be particularly useful.

"There is a paradoxical relationship that occurs in the info-tech culture. As the individual becomes more detached from face-to-face community and withdraws into a world grounded in the illusion of autonomy, they are simultaneously compelled to multiply their standoff connections with society through an ever-expanding web of mediated communication and information yielding systems and devices" (Zeoli, 2016a, p. 4). Kenneth Gergen (1991) offers "multi-phrenia", or, a multiplicity of identities that can occur when modern individuals are overwhelmed through the demands that technology and media have on their social selves.

The title of Gergen's book *The Saturated Self* suggests a "multiplicity of frameworks" that can shield the authentic identity from emerging. The result of managing myriad social identities is that, "with everything we know to be true about ourselves, other voices within respond with doubt and even derision …. an authentic self recedes from view" (Gergen, 1991. P. 6-7). Students are not immune from social media and are high –adopters new/mobile technology. The advent of social media and the multiple profiles that one must manage present a cacophony of worldviews that create in us the competing needs of participation and solitude, or as Gergen (1991) notes, "islands of self-righteousness in a sea of antagonism" (p. xv). The presence of the early educator attenuates these effects and media literacy practices can act as a buffer to the allure of social applications. Gergen (1991) warned that with limitless social interaction, individuals may experience, "the onset of a 'multi-phrenic condition' that is magnified by a 'vertigo of unlimited multiplicity' and the inevitable dilution of meaning to mere insinuation" (p. 49). The proposed research will identify the means through which teachers guide students to avoid Gergen's concern.

Anthony Giddens, writing in *The Consequences of Modernity* coincides with Gergen's (1991) multi-phrenic postulate. Giddens perceived that the contemporary culture was experiencing shifts that had distinct implications for human interaction. He notes that contingency, fear of commitment and above all uncertainty cloud truth and knowledge systems. Gergen (1991) and Giddens (1991) may have identified prescient tools for understanding the influence of technology on knowledge, or they may have overestimated these effects. However, the characteristics of modernity can still cause doubt and uncertainty in the early educator, who is asked to provide expertise and stability to the contemporary student. Without the teachers guidance we may be as Giddens (1991) warns; "abroad in a world which is

thoroughly constituted through reflexively applied knowledge, but where . . .we can never be sure any given element of that knowledge will not be revised" (p. 39).

The worlds that the early educated inhabit is seeing dramatic changes at the beckoning of mobile technology and new media. The influence of these technologies is most significant on children. Vanderloo (2014) notes that the most common activity for preschoolers is screen time and, "the omnipresence of screens in children's lives is not surprising, given the drastic shift in device availability, program development, and marketing efforts over the past two decades" (p. 1). Communication researcher Sherry Turkle (2011) makes the proposition that the relationship between people have been inexorably altered and new forms of relationship are on the horizon as, "technology redraws the boundaries between intimacy and solitude" (p.11). Preschoolers start using ICT's and other technology at increasingly younger ages and these interactions can take the place of authentic friendships. The social value of close relationships can be diminished because techno-surrogate pseudo-relationships do not have the characteristics of their human counterparts as a result of a lack of conflict and resolution, an absence of sharing, or any other authentic human emotion. The use of some technical devices in schools can reduces the interactions students might otherwise have with their cohorts, and Turkle (2011) warns, "I believe that sociable technology will always disappoint because it promises what it cannot deliver. It promises friendship but can only deliver performances" (p. 101). The iterative effect of reduced social interaction for children foretells developmental delays and hinders maturity. Once again, research that examines the process that teachers undertake to integrate technology in the context of the student-teacher relationship can shed light on the potential issues with mediated socialization.

Introduction of Literature Review

The examination of the socio-cultural background of teachers, technology and external stakeholders of education have revealed that technology is reorienting how individuals and institutions manage time, space and knowledge. Giddens (1991) characterizes this process as a "disembedding" of localized culture and norms through increased communication and interaction (p. 21). Technological approaches to education have opened dynamic avenues of learning and knowledge that were not imagined in the past. The connectivity of students, teachers and stakeholders offers opportunities for understanding and community that the pre-digital classroom could not. Yet, this transition comes with challenges to the meaning-making that student /teacher relationships and learning process rely upon. It is clear that inflection of the identity and personage of students and teachers are concomitant with technological integration. Technology is here. The culture is adapting. Schools are moving forward. Technological integration is advancing. The purpose of this study and dissertation is to examine two vital facets of the early education process in the context of an expeditious implementation of technology and simply ask teachers; How's it going? ….How are you pulling this off? …. *Are* you pulling this off? . . . . .Can we help?.... How? . . .Can you help us? . . . How? Before a formal method for this study is proposed, and these questions are made less colloquial, this proposal turns to extant research in order to inform the inquiry and provide a basis for understanding from what place to embark.

Chapter 3 Literature Review

The following literature review corresponds to three research questions that establish the inquiry of this study and dissertation. These research questions center on: (a) technology (b) as integrated in schools and (c) the relationship between the teacher, student and parent. This literature review corresponds to those subject areas in order to provide a grounding of extant knowledge from which to conceptualize and design the study that will examine teachers and technology. The proposed research is qualitative in nature. As such this literature review will examine the social relationship in question first, teachers and students, followed by the context of the study, technology and its integration in educational institutions.

The first area of the literature review examines the teachers themselves. This literature will examine: (a) barriers, benefits and bias of technology (b) teachers as precursor for integration and learning and (c) the fostering of relationships to empower learning. A second area of focus corresponding to the research questions are nascent primary students, and include; (a) access to technology: omnipresence and expectation (b) social and developmental impact: evaluation and response and (c) play, care and trust as student development.

The third area of this literature review examines the role of technology in education and the implications of its integration and include (a) a get em' while there young mentality (b) the impetus and inertia of technology integration and (c) preparing teachers and students for integration. The final area of focus in this literature review will examine the variants of technology integration in educational institutions including: (a) competing views on the integration and pedagogy of technology, (b) its development and trajectory and finally (c) its exemplars and alternatives.

The first day of school has always been a meaningful moment for families and teachers (Johnson, V., 2017). Parents place their trust in the schools that they have sought out to educate their children and to keep them safe. When that day comes, parents turn away from the school bus, or drop their children at the school door - leaving them in the knowledge that the teachers, and their unfamiliar children, will construct a relationship that provides trust and care. An examination of the early process of teaching includes: socialization (Kirk, G., & MacCallum, 2017), enculturation into society (Denham, S., Baskett, H., & Miller, S., 2017), pre-cursors of work-life (Shen, Y., 2014), and building core competencies and skills (Johnson, V., 2017).

On that first day of school, teachers build the scaffold of each new student relationship with the intention to deliver on specific, and prolific, goals. The leaning outcomes that teachers hope to achieve are contingent on the early educator's ability to provide each student with the cognitive and social tools required in order to render knowledge from mere information. Even before a cognitive toolbox can be assembled, teachers must identify how to communication with students. Communication is the prerequisite that enables children to learn: language, literacy, perception, and the channels through which these tools can be utilized. Communication is the meta-tool that acts as the gateway to learning for every student and is the conduit of the relationship that lies on the other side. This literature review will examine the ramifications of technology and media in early education and scrutinize the relationships that teachers' cultivate with students.

Early Educators

Barriers, Benefits and Bias of Technology

This dissertation and study postulate the integration of technology in schools as a process, and rests on the claim that the process of technology integration can be examined from the

standpoint of the early educator in order to produce relevant and useful theory. Ruggiero and Mong, (2015) support this view:

> The integration of technology into daily classroom protocols is described as a way of creating and learning, a process, rather than a specific technology tool. Participants shared their overall view of technology integration as a process to create learning. (p. 168)

The researchers conducted a thematic analysis of 1048 teachers from 100 schools to discover their perceptions of technology integration. The results of the study further support the premise of this dissertation proposal as, "four themes regarding in-service teacher views on pedagogical principles and technology integration practices emerged from the data analysis . . . #1 defining technology integration as a process" (Ruggiero & Mong, 2015, p. 168).

The process of technology integration presents distinct barriers from the perspective of the early educator. Plumb and Kautz (2015), explain how teachers, "experience a wide range of barriers as they attempt to integrate information technology into their work practices" (p.1). Understanding these barriers can present challenges because, "literature which attempts to identify and understand these barriers are scant" (Plumb & Kautz, 2015, p. 1). This understanding of integration has been a durable feature of technology in the classroom. "Ertmer [reports] educators continue to grapple with both 'practical and philosophical problems' posed by the process of attempting to successfully integrate IT into their classrooms" (as cited in in Plumb & Kautz, 2015, p. 2). The process of technology integration is neither incidental nor uncomplicated for teachers as they struggle to find balance where others have failed. In spite of this, perhaps because of it, teachers stand to gain strategic advantages from technology.

McFarlane (2014) provides three specific benefits of technology integration for classroom practice; "(1) [the] reconfiguration of space such that new patterns of mobility, flexible working and activity management can occur; (2) new ways in which class activities can be triggered, orchestrated and monitored; (3) new experiences associated with the virtualization of established and routine practices" (McFarlane, 2014, p. 17). Technology provides teachers with additional tools for pedagogic practice and technology gives teachers added capacity and dynamism in their ability to instruct students (Archambault, & Kennedey, 2017; Aleniza, 2014). However, just as the very presence of technology transforms pedagogical practices, it can also alter social and relational practices.

Teachers face barriers when implementing technology in the classroom and they reap the benefits when they break through those barriers. However, the use of digital technology comes with a catch. The integration of digital technologies are often accompanied by a hidden accomplice. Teachers must act as virtual safety monitors for the early education environment for each of their students. Mathiesen's 2013 article, *Who cares?: Practical Ethics and the Problem of Underage Users of Social Networking Sites*, highlights the dangers surrounding student exposure to the Internet and social media, and proposes parental limits and usage monitors. Conversely, O'Neill (2013) claims that Internet use and privacy are a civil right that extends to children. As usual, the teacher is placed in the middle, having to act as normative broker and constitutional scholar alike. Early educators can be called upon to recondition a problem that originated in the home. Livingstone & Brake (2010), address this dilemma and point out the critical role of the educator, "addressing risk cannot be left solely to parents and children", because, "neither fully understands how to manage this [issue] online" and lack "sufficient resources to do so" (p. 79). The teacher-student-parent-relationship can benefit from early

interaction, which should occur prior to the start of schooling. Vanderloo (2014) advocates for teacher training and a balance between positions with, "the imperative for greater attention to 'at risk' children in particular, and the importance of a children's rights framework in developing evidence-based policy" (p. 2). As teachers face numerous issues of digital responsibility, reproduction and exposure, they do so as human beings with opinions and bias that they must also account for and modulate.

Teachers are not empty vessels in their valence and ability with and toward media and technology. As new media and mobile technology are introduced, the teacher strives to remain neutral, but often does not. Hunt & Jones (2015) found when teachers are asked to defend the use digital game play (DGP) implementation, they "need to experience their own form of subjective 'success' in order to find DGP valuable" in the classroom (Hunt & Jones, 2015, p. 1). The researchers found that tech-neutrals or tech-detractors held perceptions of tech-proponent teachers as implementing "everything techie", especially if they had a personal propensity for technology use. In fact Hunt & Jones (2015) found support that technology "believers" viewed their ability as teachers to be more "innovative" if they incorporated the use of technology. The problem of bias as a barrier to technology integration for the delivery of learning objectives offers a basis of inquiry for this study, particularly if, "self-identifying as an educational technology innovator/ enthusiast was a necessary condition for developing strong beliefs in the value of DGP's", or other media and technology "in the classroom" (Hunt & Jones, 2015, p. 12).

Teachers as the Precursor for Technology Integration and Learning

Ruggiero and Mong (2015) provide a perspective for technology integration as a legitimate and ongoing area of inquiry for researchers, "Technology integration has been an ongoing process among educators and education researchers for the past three decades"

(Ruggiero & Mong, 2015, p. 162). Understanding the role and efficacy of technology use in the classroom has been presaged on a wide body of theoretical and applied research. A simplified summation of this research would be reductionist, but it would be fair to say that the successful use of technology in the classroom can be said to be conditional. Neumann & Nuemann (2017), explain that the landscape of the contemporary classroom achieves learning objectives through dynamic convergence of resources; "Knowledge, skills, and understandings of literacy emerge through sociocultural interactions with non-digital tools (e.g., paper-printed books) and digital tools (e.g., touch screen tablets). However, debate is ongoing over the role that digital experiences play in emergent literacy development" (p. 471). In the environment of digital and non-digital resources, there remains one constant:

> Research over the last ten years suggests that in order for technology integration to be fully accepted in the classroom, the teacher needs to be a key stakeholder in the adoption process and to help create the active learning process that will allow technology to take root and grow as an indispensable tool of education. (Ruggiero & Mong, 2015, p. 168)

The tech tools and resources that teachers utilize in their classrooms to achieve learning objectives is, in most cases, determined as policy outside their classrooms (Hollands, Griffin & Saxberg, 2017). The role of administrators is often to set the objectives for system-wide policy on specific technology adoption. However, the manner in which available technology is incorporated into daily activities in the classroom is often left up to the individual teacher. There are many sources of information for teachers to turn to for sound pedagogic practice including in-service training, teacher conventions and peer-support. A majority of early educators accept technology integration, two out of three want additional technology, and 80% say they require more training on its use in the classroom (Pew, 2018). It must also be noted that the use of

media and technology are widely praised by students, and teachers have found technology to improve their delivery of content (Education Week. (2017). Still, teachers must decide between several information sources to determine best practice for their technology use in their classroom.

Deciding what software/apps/media to use in classrooms can be a daunting process for early educators. Teachers can turn directly to research for answers that are of particular use to young students and preschoolers. An example of this is found in Wauters, Lievens, & Valcke (2015), who advise educators on social media implementation by, "providing clear, age-appropriate information" and "reducing risks and maximizing opportunities related to social network site use" (p. 362). Livingstone & Brake (2010) suggest that teachers undertake a kind of SWOT analysis of technology prior to its implementation as, "[media] opportunities and risks are linked . . . so that the more opportunities they take up, the more risks they encounter" (p. 79). Taking this stance may help teachers with potential bias and inform them of the risks and benefits associated with technology integration.

The final aspect of interest for early educators and learning objectives are the cultural differences that students present to the challenge of instruction. As discussed, students will arrive in schools with a diversity of expectations on the use of technology. Determining appropriate time exposures to media and technology will include an assessment of the previous use patterns of students and a variety of expert opinions (Vanderloo, 2014). In addition to exposure, maintaining relevance is a consistent demand for young learners (Sepelyak, 2016). In the end, it will be the judgment of teachers that will create best practices for the use of ICT's. Teachers can respond by enacting modifying and equalizing strategies. Heintz & Wartella, (2012) found that

successful media literacy efforts are conditional to the appropriate use of language that students can relate to and a subject matter that is culturally relevant to the experience of learners.

Fostering Relationships to Empower Learning

The relationship that teachers nourish with students is a fundamental building block of the social integration of the student. The manner in which technology integration influences this relationship is examined on two fronts: personal development and citizenship. Teachers act as authorities on the external world in the imagination and learning ability of children. As such, early educators are in a unique position to assist young people as they are bombarded with consumer messages and provide them with some support to navigate rhetorical messaging (Gordon, Jones, Kervin, & Lee, 2016). Though some media and messages are beneficial to young students, many claims of educational benefit remain unsubstantiated (CDCF, n.d., para. 9). A benefit to the exposure that digital technology attends is the introduction of diverse people and places that can help students understand their own place in the world. However, as students start to use the Internet, they establish *online* identities, even as the student's own core identity is not yet formed (Gergen, 1991). Teachers can help students understand the difference between the make-believe avatar(s) and the true self.

The traditional role of teachers is often viewed as follows: one who develops the students' cognitive abilities and facilitates their learning. Technology can have an effect on the cognitive load that young students face because, "as communicative environments develop, so do the media or digital literacy demands on their users" (Livingstone & Brake, 2010, p.79). Teachers act as cognitive monitors that place young learners on a "pitch count" of sensory input, a job that is magnified as technical integration increases. The cognitive load of technology brings reading readiness and the diversity of technological capabilities squarely into view. Zevenbergen

and Logan (2008) report, “there is a need for early childhood providers to be acutely aware of the differences in the access of families and children to these technologies, which may be creating the potential for considerable differences in skill development and very different learning opportunities for children (p. 43). As a result of technology integration, teachers carry additional weight, as they manage the cognitive development of their students.

As students come to the elementary classroom, they do so with limited knowledge of their role as citizens, but they leave with an understanding of their social and civic responsibilities and privileges. Through this process a sense of the Other is developed. Meier (1995) emphasizes “the capacity to see the world as others might” and envisions the role of the teacher to arouse “unsentimental compassion” in the students that will provide them with the basis of “both intellectual skepticism and empathy” (Meier, 1995, p. 64). Teachers create the basis for the cultural narrative that each student will carry with them into the world. The classroom provides the social incubator for this knowledge to arise.

The relationship between teachers and students is paramount to student success. The influence that instructors bear is amplified in early education settings, where teachers act as sentinels of safety and comfort to young students socializing into a new world. A prolific body of research supports the prerequisite importance of the student-teacher relationships to student development and achievement (Haslip & Gullo, 2018; Timmons, 2018; Denham, Baskett, & Miller, 2017; Wells; 2015; McFarlane, 2015; Ruggiero & Mong, 2015; Mooji, Dijkstra, Walraven & Kirschner, 2014; Livingstone, 2010; Clinton, (2006); Paley, 1995; Meier, 1992; Postman & Weingarner, 1969; Postman, 1992; 2000). The importance of teachers to the student’s development, socialization and academic success cannot be understated. In this limited review, only a small sample of these issues will be addressed and will focus on the relational

aspects that apply specifically to the integration of technology. Two areas are examined; the role of teacher-parent relationship and the role of technology in communicating vital features of the student-teacher relationship.

Parents and preschoolers form distinct media practices that migrate to the classroom environment. Terras & Ransay (2016) note that, "Given parental concerns about the possible negative impact of technologies, parental awareness should be raised about the influence of their behavior in the context of Internet safety along with the adoption of good digital literacy practice" (p.1). Unfortunately, mobilization of parents can trigger the "not my kid" syndrome. Eckstein (2012) conducted a study in which her hypothesis - that parents would presume more detrimental effects of media in other parents children, while discounting them in their own children - was confirmed. This attribution error can cause complications and delays for teachers who are trying to build relationships with parents during technology integration in order to triangulate the teacher-student relationship and build community.

Early educators experience both opportunities and adversity when fostering parent relationships. Conduits for communication between the teacher and parent are available once the student enters the school, but there is a need for *before- school* intervention concerning the technical socialization process (Johnson, V., 2017). The American Academy of Pediatrics (2016) website states, " . . . parents can help guide their children's media experience. Putting questionable content into context" (para. 5). Community activities provide the means to communicate, "parental rules for viewing time" (Hoyos-Cilero & Jago, 2010, p. 7). Parents can be directed to resources and support organizations that provide a variety of relevant information (Strasburger, et al., 2013). On the path to media literacy for students, teachers are required to participate, but parents must choose to do so.

Emerging and Early Primary Students

The proposed research will examine the integration of technology in schools in relation to the educator's ability to promote learning and build relationships with students. The teacher-student relationship provides teachers with the ability to be believed. For nascent students the teacher relationship is that of a surrogate parent. They are the first non-family members (whether by genetics, law or preference) that the student will be told to "go to" when trouble occurs. To put it plainly, teachers are surrogate parents from the perspective of the student. Teachers seek to build the trust that can lead to friendship, and eventually to an authentic loving relationship. Thus, in order to understand the opportunities and difficulties that the contemporary student presents to the teacher who seeks relationship, this section of the literature review will provide an inquiry in the contemporary student, their use of technology, and the challenges they present to the teacher-student relationship.

Access to Technology: **Omnipresence and Expectation**

The context of this study is technology integration in schools. An examination of the manner in which teachers "base-line" technology is related to the their "audience" expectations. In this case, that means the nascent student. The first aspect of relevance to the influence of technology on nascent students is the ubiquity of technology in the lives of students. The most researched phenomena in the relationship between children, media and technology is screen time. This perspective is most commonly approached from a functionalist viewpoint and the most researched areas of inquiry include: ubiquity (Gros, 2016), sedentariness and obesity (Taverno-Ross, Dowda, Saunders, & Pate, 2013), and media effects (Zhou & Yadav, 2017). Qualitative approaches have examined parental/family relationships (Black, 2014), child

development (Kirk, G., & MacCallum, 2017) and risk and abuse (Manning, M. S. (2017). Both ontological perspectives have examined educational settings.

The ubiquity of technology is a characterization about media, technology and technological devices as omnipresent in culture. Preschoolers and children in early education may not experience "ubiquity" in the same manner as older individuals, because they do not regard the presence of technology as magnified. Instead, they experience media and technology as archetypal to social interaction. Hienz & Wartella, (2012) reveal that, "from print media through screen media (television, computers) to mobile technologies (iPods, tablets, cell phones), American children increasingly live in homes that enable them to have media as part of their lives during nearly all of their waking hours" (p. 22). The Canadian Government revealed "Canadian kids spend an average of 7.5 hours in front of screens each day" (ParticiPACTION, 2016, para. 1). Though some of these estimates have been questioned, Dr. Leigh Vanderloo (2014) notes that the most common form of activity for young children is the use of media, and states "the omnipresence of screens in children's lives is not surprising, given the drastic shift in device availability, program development, and marketing efforts over the past two decades" (Vanderloo, 2014, p. 1). Other studies bear out this apogee of screen time including the American Academy of Pediatrics (2016) claiming, "6 and 7 hours per day using screen media" (CDCF, para. 2). A recent study at Statista showed that 65% of parents allow their kids screen time to be between 2-8 hours daily (Statista). Screen –time combines the use of television, computers, games and other flat screen media devices. Having established a considerable saturation of screen time for preschoolers, the logical question arises, how do individuals who are "other-dependent" for media, get this much exposure to media?

A body of research suggests that parents in contemporary culture sanction copious amounts of media in the home. Children of all ages have seen increases in media use in recent years and most significantly, "time with screens increases rapidly in the early years" (CDCF, n.d., para 2). This exposure begins at ages not understood in previous generations. The *Center for a Commercial Free Childhood* conducted research to examine this phenomena and found that "between their first and second birthday, on any given day, 64% of babies and toddlers are watching TV and videos, averaging slightly over 2 hours" and among children under 12 that, "thirty-six percent have a television in their bedroom" (CDCF, para. 2). Carson & Janssen (2012) found that the relationship between parents/care-givers and children is critical to understanding how preschoolers come to use media. The parental role in media policy can be characterized by expectation and contradiction. Parents increased use of media is influential to children's use patterns. Research on screen time and media use has been going on for more than 30 years, with the same contingency over parental control (Ruggiero & Mong, 2015). However, the current cultural condition places great pressure on parents, who must navigate a society that demands the integrated use of technology for its children, while simultaneously warning of the potentially isolating and detrimental interpersonal effects of media overuse. "In the digital era, parents often feel adrift and unable to know what is best for their kids" (Zeoli, 2016b, p. 27).

Parents do not feel qualified to make intentional decisions about tech devices and struggle differentiating educational from unsavory apps. As a result, few enact temporal boundaries (Zosh, Lytle, Golinkoff, Hirsh-Pasek, 2017). Caregivers often suffer from a lack of information, and where sources do exist, they are not sure whom they can trust. There is also the nagging problem of technical knowledge. Without knowledge or information, parents can make poor assumptions such as, "the most common reason parents give for infant and toddler screen

time is that it is beneficial to children's brain development" (CDCF, n.d., 9). Carson & Janssen (2012) conducted a meta-analysis of media use in the home and found that, "in fact, the only consistently reported factor across reviews was parental television viewing rules" (p. 2). As can be seen, the usage pattern of parents, have significant weight with their children. Efforts to limit screen time should consider that strategies, "may be most effective if they target parents for behavioral change" (Carson & Janssen, 2012, p. 1; Black, 2014). The proposed research will uncover best practices for teachers and provide parents new paths for balancing the use of media in the home.

Social and Developmental Impact: Evaluation and Response

The public response to technology can frame the position of the teachers that integrate technology. Public school teachers are government employees and a part if the public sector. The evaluation and response of the public sector can provide insight into the mentality of teachers. Prolific research has been undertaken on the negative health effects of screen-time. These approaches share the premise that a sedentary lifestyle is related to media use resulting in health issues. This research focuses on childhood development issues in relation to media use in a variety of settings and foci including; financial limitations (Mcclain, K., 2015), availability in child-care settings (Taverno, Dowda, Ross, & Pate, 2013), and developing media use policy (Christakis & Garrison, 2009**).**

In response to health data, government agencies have taken action to provide timely and relevant information to the public. These efforts promote best practices, provide information for citizens and embrace a special responsibility to children. Information included on government sites act as public policy initiatives for issues such as; the balance of digital and analog "play" (Canadian, 2016) alternatives for children's media (Public Health England, 2013), and web

resources for parents and protection of children from Internet predators (Kids.gov, 2015). The United States Government website Kids.gov provides advice to parents that includes; “Check on whether the app connects to social media”, “determine whether you can block or limit connections”, and `“talk to your kids about the restrictions you set for downloading, purchasing and using apps; tell them what information you’re comfortable sharing through mobile devices, and why” (Kids.gov, 2015). These institutional concerns with health are also seen in another prevalent body of research on screens and kids, the problem of childhood obesity.

In 2010, Michelle Obama declared childhood obesity to be an epidemic in America, where young people are the most obese in the industrialized world (Let’s Move, 2017). The sedentary-health link is most profound where the lack of physical fitness and obesity are strongly correlated with technology and media use. This trend has been considerable. Dowda, Pate, Trost, Almeida, & Sirard, designed a study as far back as 2004 that showed students in daycare would increase their physical activity, “by training childcare providers to deliver a physical activity curriculum” (p. 183). Their findings suggest improved health follow a policy of intentional interventions where screen-time was reduced and physical activity increased (Dowda, Pate, Trost, Almeida, & Sirard, 2004). This trend has continued to be born out in recurring research (Heelan & Eisenmann, 2006; Taverno-Ross, Dowda, Saunders., & Pate, 2013).

A second form of evaluation and response in the public view is the media effects perspective to children, and technology. Gentile, Saleem & Anderson (2007) offered a connection between the increase in governmental and agency response to technology matters, and the perceived negative effects of media and technology. The question of media effects has become even more significant because of a general view that technology and media connects people and a rapid increase of media and messages in daily life. Despite the myriad positive

effects of media, other media effect studies reveal detrimental outcomes including; resistance to intervention (Rigler, 2015); violent behavior (Coyne, et al., 2017); and sexual health issues (Collins, et al., 2017). The effects of media include the exposure to content, the use of devices and the aforementioned and oft ignored ecological effects. Media effects literature has found that iterative exposure can be significant. Jago, Sebire, Edwards & Thompson (2013) found that, "each additional piece of media equipment in the home was associated with a 28 % increase in the likelihood that parents watched ≥2 h of TV per day" (p. 1545). It should be noted that media effects research approaches have been criticized on methodological grounds. Wartella, Huston, Rideout, & Robb (2009), investigated these claims and offered new strategies for appropriate measurement and Gillis et al. (2013) examined the lack of clear evidence, and the confirmation of repetitive initial research studies, calling for a more rigorous approach to preschooler media use research. Some research has trended toward positive results, while others maintain a focus on screen-time as detrimental to development. Teachers that have been educated to teach at the K-2 levels may have knowledge of this research and it has bearing in the proposed study.

Play, Care, and Trust as Student Development

This proposal highlights the influence and outcomes that the introduction of technology into social interaction can propagate. Analysis at the interpersonal level reveals distinct influences from the introduction of technology. In the context of the teachers' profession, their motive has not changed, but the message and the method have been transformed. The relationship between teacher and student, particularly in early education settings, is paramount to the development of children and is critical to their education. The proposed inquiry triggers relevant questions; What is the essence of a student teacher relationship? In what ways do technology influence the relationship between the student and teacher?

Wells (2014) explains how the vital nature of the student-teacher relationship becomes "an important component of a student's success in school. Student-teacher relationships have the potential to serve as an asset for students' well-being and achievement throughout their school career" (p.ix). The cultivation of student comfort and safety is correlated to performance, "and research has indicated that student-teacher relationships characterized by closeness are linked to benecial academic and behavior outcomes for students (Wells, 2014, p. ix).

Research has uncovered that these early experiences set the frame for an individual in later life, providing context to relationship in that, "the entire organism must be nourished, and consequences become severe when any area of development is neglected, and when loving relationships are not present to ensure developmental balance is maintained across all aspects of a child's life" (Haslip & Gullo, 2017, p. 7). Blackwell (2015) suggests that educators need to reconsider the developmentally appropriate tools and technology that they utilize in their classroom and align them with the student's developmental needs, rather than their academic goals. Put more colloquially- healthy heart, healthy mind. Finally, Zevenbergen & Logan, 2008, offer us a challenge as the digital realm takes hold, "if early childhood educators are to cater for these digital natives, digital experiences need to become part of the everyday practice of [daycare] centers. Just as the home corner and block corners are an important aspect of the early childhood setting, so too the digital corner may need to be built into the practices" (p. 43).

Identifying and utilizing proven best practices can ease the transition of technology integration in schools. As we enter a new world of digital technology there are lessons from the analog realm we can steal away for the journey. To begin, Deborah Meier (1995) calls us to consider a personal relationship a prerequisite to education because, "Kindergarten is the one place— maybe the last place— where teachers are expected to know children well, even if they

don't hand in their homework, finish their Friday tests, or pay attention" (p. 48). Meier addresses Giddens' (1991) problem of "disembedding", by delivering on the requirement of *trust* to the social situation. In order to develop such a relationship, Vivian Paley (1992) calls on teachers to engender a sense of play with students that will foster authentic relationships, and form a community of learners. Paley (1992) identifies the ideal path for the student who first becomes comfortable communicating, then comes to trust, and finally attains social bonds with their most essential mentor in early life, their teacher.

Technology and Media

The development and use of technology and media have carried our culture across the Rubicon, and into a territory from which we can never return. The manner in which we now engage with technology is no longer something that we *can* experience, it *is* experience. For children, it has become integral to their ability to interface with the social. Fowler (2015) notes that children are no longer "passive consumers of content", and instead are "positioned as active creators" of their worlds (p. 84). Lyotard's (1979) forecast on the coming influence of technology on learning seems more understatement than prophecy when he states that, "technical transformations can be said to have a considerable impact on knowledge" (p.4). Leslie Haddon (2011) has the sense that the train has already left the station when she notes that, "there is scope for saying more about the centrality and integration of ICT's in daily life, [it] is a way to address those wider discourses . . . about how much impact new technologies might have, about how much change they will bring about in our lives" (p. 317). Technological transformations put us on a trajectory of perpetual transition as we encounter each new medium, device and set of

practices. Children and young people understand these anomic conditions as archetypal and are able to make adjustments in real time. Livingston & Brake, (2010) explain this process:

> Governments, the public and even technology providers are taken aback by the unexpected uptake among young people of yet another innovation — email, chat-rooms, texting, instant messaging, blogging and, recently, social networking sites. Public policy aspirations quickly capitalize on these youthful enthusiasms, seeking to revitalize agendas of informal education, health and lifestyle advice, and civic participation. Simultaneously, technological innovations afford the commercial world new possibilities for targeted and embedded marketing, while public policy is also required to address new online risks to children's well-being. (p. 75)

Educational Institutions, administrators and teachers have all participated in this process, striving to maintain cultural relevance through the delivery of learning in new contexts.

Get em' While They're Young

The metamorphosis of media and technology in the third millennium has reoriented the life-worlds of children. At the turn of the century, the word Internet was something new to the lexicon of communication and the impact of media had just begun its upward trend –dail-up reigned. By 2013, preschoolers spent half of their waking hours with a media device and "nearly six out of 10 children (58%) watched TV at least once a day, compared to 17% who used mobile devices on an everyday basis, 14% who are daily computer users, and 6% who play video games every day" (Common Sense Media, 2013, para. 6). This was a status quo that would soon change. Researchers predicted a trend toward smartphones and, "the use of touch screen tablets by young children is increasing in the home and in early childhood settings" (Neumann & Neumann, 2013, p. 231). They were right. Two years later, Blackwell (2015) cites a two-fold

increase in the use of tablet computers in early education classroom with no socioeconomic disparity. The era of the socio-tech was underway. ‘

This proposal has identified a cohort of students that are currently entering early education environments. These children are referred to as “socio-techs” because of the integration of technology into their social experience. It is important to note that this classification is established only as a means to understand the subject of this study, American K-2 teachers. Nonetheless, three distinct developments compromise the shared condition of the “socio-tech” and they triangulate where preschooler/primary school students reside; (1) the development, diffusion and saturation of smartphones and tablet computers and “app” media and applications into a fully mobile experience (2) the saturation and interconnectivity of smart devices as fully penetrated into the social lives of the cohort and (3) the availability and diffusion of Wi-Fi Internet infrastructure in the home, accompanied by the rapid increase in available Wi-Fi speeds. Technical apparatus are integrated throughout the domicile of the many socio-techs, enabling fully mediated communication and unlimited access to devices that provide information, entertainment and companionship through content developed and marketed specifically to their unique cognitive and social abilities.

The smartphone has been available for more than 10 years. An elite few originally possessed a Blackberry, but limitations to its operating system and the Wi-Fi that fueled them was scant. In 2007, the iPhone arrived on the market and the introduction of the rudimentary iOS system was a leading indicator to a revolution in communication (SMS Global, 2015). However, it was the introduction of 4G technology in 2010 that enabled the Android and iOS systems to flourish and foretold today’s marketplace. Pew reported in January of 2018 that 77% of American adults own a smartphone, up from just 35% in 2012 (Pew- Mobile Fact, 2018).

However, for those under 50, the percentage reaches a staggering 93%, and explains the deep penetration into homes with children (Pew-Mobile, 2018). Concurrently, availability of tablets in the home has quadrupled in 6 years and now rests at 53% of American adults own a smart-enabled computer tablet (Pew-Mobile, 2018). We can hot-spot our phones to make our computers and tablets work anywhere, and many cars are now wired - all of these developments before the internet of things and artificial intelligence has even taken hold. Still, more than any other statistic that bears out the socio-tech cohort is the penetration of smart devices in the average American home. Pew Research Center "Fact-tank" reports the following:

> Taken together, 90% of U.S. households contain at least one of these devices (smartphone, desktop/laptop computer, tablet or streaming media device), with the typical (median) American household containing five of them. And nearly one-in-five American households (18%) are "hyper-connected" – meaning they contain 10 or more of these devices. (Pew- Fact tank, 2017)

This revelation from Pew is even more impactful when the fact is borne out that gaming systems and dedicated electronic toys are not even accounted for in the survey. Based on these statistics, and the years that the penetration of these devices and Wi-Fi speeds escalated, a new cohort of fully mobile, heavily saturated media users started arriving in primary school Kindergartens in 2016.

The full implications of this development cannot be addressed here. However, this proposal and dissertation will focus on the ramifications to the teacher in the contemporary classroom. The escalation in media exposure over the past decade indicates that messages not originally intended for preschoolers can reach them. A common marketing strategy recognizes the cognitive abilities of the preschooler because, "2 to 6 year olds can recognize familiar brand

names, packaging, logos, and characters and associate them with products, especially if the brands use salient features such as bright colors, pictures and cartoon characters" (Jolls, 2010, para. 4). Mascheroni & Olafsson, reporting on a 2015 study funded by the European Union finds that "smartphones are the most used devices on a daily basis in all contexts. Being personal and portable, smartphones are seemingly carried around in various places and integrated into different social contexts and activities" (p. 15). The knowledge gained by advertisers and marketers have ramifications for branding strategies that use iterative exposure to their intended effect, a strategy under which children are highly susceptible.

The integration of media and technology in schools is vulnerable to the same commodification as commercial endeavors. Haslip & Gullo (2016) explain, "As long as children are treated as a commodity and education as an industry, this turmoil is likely to continue with researchers and companies benefiting or profiting at a comfortable distance from the child's daily reality" (p. 7). This admonishment is reminiscent of Ellul's (1964) concern that efficiency, rather than value, could become the criterion of legitimacy in a technological society. Integration of technology in schools *can* be undertaken with awareness and discernment. "To change social philosophy away from the commodification of education will require a new moral foundation of principled decision-making " (Haslip & Gullo, 2017, p. 7).

The Impetus and Inertia of Technology Integration

The implications of media and technology orbiting the zenith of student's consciousness will have ramifications for teachers that include; who will show up, what they will expect, and the content and method of communication. Electronic media have circumvented the known limitations of communication by altering the perception of space and time (Postman, 1992). As patterns of use for technology ossify in our culture, they first take the shape of accepted novelty,

then behavioral norm, and eventually, as a form of ideology. The student raised on technology believes it to be as materially relevant as the school bus they ride on, or the desk they sit on, and as socially necessary as language to their survival as individuals and students.

Adjustments to curriculum can ease the increase in media exposure and reduce student expectations. The adoption of a media literacy curriculum can aid young students with awareness and comprehension about the media they consume and can be initiated as early as media consumption begins. The Center for Media Literacy mission statement that reads:

> Based on the core concepts of media literacy . . . children develop a quick methodology for critically analyzing any media message they come across, and by practicing this methodology over time, they acquire a common vocabulary and internalized process for discernment. (Jolls, 2010, para. 3)

Media Literacy content and awareness strategies can assist early educators goals. However, many students have already learned to teach themselves through "educational" applications, or "apps". By 2014, there were already over 700,00 educational applications available (Adjust, 2014). Though extrapolated from several available databases, today's estimates run from 1-1.5 million apps categorized or marketed as "educational". Marketing toward children is a massive business and parents who need a justification for the use of tablets and smartphones often see educational apps as a reason for preschooler to use them (Gordon, Jones, Kervin, & Lee, 2016). Iterative exposure to educational apps result in students who come to school with pattered learning behaviors and technical interface expectations, further complicating the role of teachers tasked to integrate technology in the classroom.

Preparing Teachers and Students for Integration

Teachers face many concerns as they meet new students and integrate technology and

media in their classrooms. Early educators are in a perennial state of evaluating the social situation as, "new technologies change relations, identities, and complex power structures" (Hasse, 2017, p. 365). In addition to the preconceived ideas about schools and learning garnered from media exposure, nascent students also have an understanding of the difficulties that their teachers face in their adult-world (Meyrowitz, 1986). Issues of reading readiness are complicated by extant conceptions of literacy, where some students are considered digital literates. yet struggle outside of digital formats (Nuemann, Finger, & Nuemann, 2017). Some children struggle adjusting to the structure experienced in schools, and their acclimatization is magnified by the freedom they experience with media devices in the home. Hasse (2017) concludes, "the new skills and analytic capabilities that teachers need in order to engage effectively with technological development . . . should be included in the education of technological literacy to pre-service teachers" (p. 365). As the nascent student changes and the culture is altered, teachers remain, providing guidance and answers for each new cohort of learners.

Haslip and Gullo (2017) summarize the conditions that early educators encounter; "changing demographics, changes in early childhood curriculum and instruction, increased focus on accountability, advances in research that inform and alter early childhood education, influences affecting teacher preparation and professional development, and global trends affecting early education and care" (p. 1). Technology presents additional dynamics to these concerns. Ruggiero & Mong (2015) provide the a classification of barriers to technological integration, in extant education research:

> *External* barriers do exist that impact technology integration, such as a lack of in-service training, a lack of available technology, and restricted curriculum, but that overcoming *internal* barriers, including personal investment in technology, attitude towards

technology, and peer support, were a bigger indicator of success. (p. 161)

This research proposal and dissertation investigates two other conceptions of barriers to technological integration in the classroom: structural and relational. The socio-tech student is a product of structural changes in the culture that have significant ramifications on successful integration of media and technology in the classroom. These students demand reform to pedagogy by their very presence. Additionally, emerging social and interpersonal patterns provide new opportunities and challenges to relationships that, if not addressed, can cause distance and confusion in the vital relationship between the teacher and student (Kirk, G., & MacCallum, 2017). Both teachers and students will need to prepare for the changes brought about by transformations to the technical apparatus. In order to further investigate these characteristics, the literature review will examine the educational institutions where these adjustments will take place.

Educational Institutions

Qualitative research seeks to uncover and understand the significance of social phenomena as it occurs in situ, that is, from within the social situation that the phenomena originates. This emic approach places a priority on attaining qualitative data that can shed light on the principals of particular phenomenon as they occur (Guba & Lincoln, 1985). This research proposal seeks qualitative data that can produce a theory of the process of teacher integration of technology and the ramification to their relationships with students. This study will center on teacher experiences and actions. The site of the research is the teacher, but early educators ply their trade in schools/institutions. In order to understand the phenomena under study, the final

focus of this literature review will be the schools/educational institutions and the attitudes and actions that institutions have taken toward technology integration.

Educational institutions face many opportunities as technology and media are integrated. There are numerous benefits to the administration in data management, student records and other efficiencies (Seeman, 2006). The advantages of technology to pedagogic practice arise from its ability to control and monitor what is taught in each school and each class, and to monitor student progress and teacher performance (Menon, 2017). Finally, technological systems assist schools in the standardization of curriculum and enforcement of test standards (Beane, 2016). The critique of technological systems and integration in educational systems, and the consequences of their implementation are present in several scholarly perspectives including; commodification (Lyotard, 1979), power inequity (Giroux, 2011), politicization (Selwyn & Facer, 2013) and gender inequity in education, (Hacker, 2015). This section of the literature review will provide a basis for understanding the development of: (a) Competing views on the Integration and Pedagogy of technology (b) development and trajectory of integration and (c) exemplars and alternatives of technology integration.

Competing Views on the Integration and Pedagogy of Technology

There are unique pedagogic and social differences that inform the delivery of education through technology and media. The following review will necessarily reduce the variety of opinions and approaches to technology integration and media in educational institutions to three main categories; (a) the fully integrated online approach to education, (b) a traditionalist approach and finally, (c) the digital classroom. The common thread between these broad approaches to integration is their shared goals. Traditionalists, proponents of online schools and digital classroom advocates all claim, “the heart of all this is the requirement for interaction

between learners as part of the learning task" (McFarlane, 2014, p. 14). For those that suggest change, a common criterion is expansion of established pedagogy, rather than its revision because, "digital systems that combine the elements of feedback and connectivity can support such models in a variety of ways" (McFarlane, 2014, p. 15). Of course, there are outliers in every broad analysis, but at the center of the differences lies a shared sincerity for student success (Archambault & Kennedey, 2017; Kirk, & MacCallum, 2017**;** Aleniza, 2014; Johnson, 2017).

The position of academics and experts on the integration of technology in schools is varied. Perhaps the most controversial of these is the fully online school and, "online learning still struggles with lingering perceptions that it is somehow inferior, unproven, and limited in application relative to traditional classroom instruction. For this reason, online learning programs and courses receive closer scrutiny than their traditional counterparts" (Sener, 2005, p. 1). Proponents point to personalized service, safety and efficiency that provide students with a fully integrative experience and "prepare them for an economically and socially rewarding adult life " (McFarlane, 2014, p. 9).

The traditionalist approach to technology in the classroom can be seen in legacy scholars such as Paley (1992) and Meier (1995). Traditionalists are not luddites and they do not reject technology in their personal lives. Their resistance toward technology is based on their focus on relationship building in the classroom. Traditionalists assume that media of any kind is essentially a distraction from direct teacher attention (Evans, 2017). Theses assumptions are in opposition to the online school proponents.

Proponents of digital classrooms take the position that learning devices are extensions of resources and connect students in dynamic and efficient ways, allowing for an iterative effect that improves learner retention (McFarlane, 2015, p.15). In support of digital classes, proponents

appeal lies in, “adapting effective practice to new contexts is at the heart of understanding how digital technologies can best support effective teaching and meaningful, authentic learning” (McFarlane, 2014, p. 9; Chung & Khe, 2017). A final analysis of these differences in approach is difficult because the approaches suffer from incommensurability in “uniformity of practice” that indicates that a single “answer” to the debate “does not exist” in a satisfactory sense (Sener, 2005, p. 1). Whether the traditionalist approach can survive the contemporary culture, and whether fully online schools will become incidental remains to be seen as the trajectory of the dominant form of classroom practice takes hold.

Development and Trajectory

To understand the diversity of positions for technology in schools a brief understanding of their history and development is useful. As might be expected, the approaches to learning and their typologies fall on the same lines: fully online, traditionalist and the digital classroom. Nearly a decade ago, the categorization of online schools could be understood through “Clarke’s” seven categories of virtual schools: State –sanctioned, College and University, Consortium and regionally based, Local education agency-based, Virtual Charter Schools, Private Virtual Schools, For-profit providers” (Cavanaugh, Barbour & Clark, 2009, p. 3). Alternatively, one could instead choose the comparatively simpler “Watson’s Five Categories”, and this is just for online schools. Clark & Watson’s categories are still relevant today and other conceptions have formed.

The trajectory of technology integration in the culture writ large has great influence to technology integration in schools. As debates over the level of inclusion of technology and media in the curriculum continue, the student body have exponentially become more “wired” as this debate rages on (Stauff, 2016). Schools are struggling with policies toward personal devices

and the use of ICT's on school property. Some schools have described these increases as infestations (Russell, 2018). There is no doubt that the increase of tablets and smartphones in the backpacks and pockets of ever-younger students has been a difficult problem for teachers and administrators. These devices can cause distractions and trigger departures from school in older students (Stauff, 2016). Some parents now insist that their younger students have access to call them or wear their track-able watch so they know where their child is at all times (Courier Mail, 2018). Technology was promoted as a tool for connectivity, and now some teachers and administrators have become hostile over their use (McFarlane, 2014).

The integration of technology and media into new classroom practices has been a considerable process (McFarlane, 2014). The digital classroom evident in Pew research reports was originally deployed in magnet schools and elite prep-schools (McFarlane, 2014). The ascendency of technology in mainstream culture heralded the call for modernization and technology integration in all sectors of society. Education was a lagging due to resistance to change among an intransigent status quo (Hennigan, 2012). Eventually, the stakeholder demands and momentum won the day.

A final area of interest is the actual performance outcomes of the use of technology in the classroom. Students have a predictable positive valence toward media, as any educator at any level will tell you. More than two-thirds of teachers now include technology in the daily preparation of their lesson plans and the same percentage have a positive view of their effectiveness (PEW, 2018). However, the holy grail of educational statistics- test scores- reveals mixed results at best. McFarlane (2014) cites that despite, "billions in investment, endless evaluation and reams of policy documents, it seems that the precise role of technology in schools remains unclear" (p. 10). These results do not doom the use of technology- not at all- this is

because, “there remains a substantial gap between what effective technology-supported learning and pedagogy could be, and what happens in the majority of schools” (McFarlane, 2014, p. 10). In other words, schools rarely deploy technology according to its program, making many test results less consequential.

Exemplars and Alternatives

Extant research on traditionalist approaches is seemingly non-existent in recent academic publications. Traditional classroom settings without technology are used almost exclusively for comparative research that ultimately promotes technology integration (Heissel, 2016). Legacy pedagogists act as the keepers of knowledge on value-laden technology-free approaches to learning. In addition, the scholars that promote relationship as the fulcrum of teaching outcomes can be more focused on the traditional learning environment (Kirk, G., & MacCallum, 2017). Despite the seemingly inevitable trajectory of the traditional classroom as an anachronism, many of the best practices of traditionalists are adopted in both the online and digital classroom.

Crowdsourcing of online faculty is an exemplar of the online classroom (Dunlap & Lowenthal, 2018). This strategy overcomes one key difficulty of online teaching, collaboration. Teachers meet virtually at a preset URL and share recommendations and best practices. Recommendations for overcoming the challenge of the full online classroom include; increased communication of stakeholders, reciprocity and cooperation among students, prompt feedback by the Instructor, student time on task, and the communication of high expectations (Dunlap & Lowenthal, 2018). Just as the online teacher modeled the traditionalist teachers, the teacher in the digital classroom utilizes the knowledge garnered in online classes to improve their chosen learning environment.

There are many possible exemplars for the success of the digital classroom, these include; artistic technology integration (Steckel, Shinas, & Verenewyck, 2015), integrated visual media (Walsh, Romo & Jeon, 2018), and serious games (Kasurinen, & Knutas, 2018). The exemplar chosen for this review had the criterion of being student-friendly, commonly used, and undecided for teacher acceptance. Digital game play (DGP) is an appropriate exemplar for the digital classroom. Pedagogy that legitimates digital game play reveals that, "serious games may enable the student to learn by virtual, direct, concrete experience characteristic of visual and experiential learning (Guillen-Nieto & Aleson-Carbonell, 2012; Proctor & Woodman, 2007; Weinberg, 2011). Slater adds that (DGP) are learner-centric approaches that are best implemented in an active-learning environment. These tools fit in a "flipped" approach because, "the student and the parent – not the teacher – are responsible for student knowledge gain" (cited in Proctor & Marks, 2013p. 171). Even so, Kirriemuir and McFarlane (2004) characterize DGP literature as "mixed. Nonetheless, a body of research supports the approach (Gee, 2008; Attard & Northecote, 2012; Hunt & Jones, 2015).

Some teachers and researchers have criticized DGP's based on relative success across the diversity of learners. Wiley reported that more successful students are "less receptive to gaming than less educated students until the games were shown to be more serious and tended toward interactive simulations" (cited in Proctor & Marks, 2013p. 178). Despite the mixed results of DGP's, they continue to be deployed in classrooms and teachers are learning to put them to use in their lesson plans. The exemplar of the digital classroom is summarized by Hunt and Jones (2015) who cite, "the educational advantage afforded by thoughtfully selected and effectively used DGP warrant consideration for all classrooms" (p. 2).

Chapter 4 Methods

"*Physical facts simply are or are not; and neither when present or absent can they be supposed to make demands. If they do, they can only do so by having desires; and then they have ceased to be purely physical facts, and have become facts of conscious sensibility*"

William James *1902* (as cited in McDermott, 1991, p. 614).

The process of early educators integration of technology in the classroom, and its implications to the development of teacher –student-parent relationships can be understood through the inquiry of qualitative research. Teachers are responsible for learning objectives and maintaining essential student relationships under increasing professional demands, while integrating technology into the ecology of their classrooms. The confluence of these conditions describes a social context for research seeking consensus, and the convergence of understandings (Guba & Lincoln, 1994). According to Cresswell, (1994), "a qualitative study is defined as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting" (p. 15).

This study aggregated relevant data on K-2 teachers that arose from the "meaning individuals assign to their "experience . . . emotions, motivations, [and] symbols" (Berg & Lune, 2012, p. 15). Finally, this study produced a theory of teachers' process of technology integration in K-2 classrooms that elucidates the teacher-student-parent relationship. The following method chapter will report; (a) the basis for utilizing qualitative, grounded theory methodology and phenomenological approaches to address the problematic and answer the research questions (b) the research procedures undertaken (c) the sampling, recruiting, research

sites and participant information (d) the theoretical sampling procedures that aimed (e) the data collection and analysis strategies and finally (f) the validity and reliability measures of this dissertation.

This dissertation investigates phenomena relevant to Instructional Communication and technology. Transformations in the technical and media apparatus comprise one aspect of this transition. These complex cultural contexts confront early educators with barriers to the delivery of their pedagogic and social commitments. Research intended to investigate teachers' life-worlds requires a rigorous design and demands a defense of the paradigms, research methods and data collection and analysis strategies. These choices are significant because "differences in paradigm assumptions . . . have important consequences for the practical conduct of inquiry" (Guba & Lincoln, 1994, p. 112). In order to clarify the assumptions of this study, this chapter begin with the rationale for the chosen methodology and provides ontological grounding, research traditions, and justification for the primary and complementary research methods, procedures, and credibility measures.

Appropriateness of Method

Qualitative communication research is appropriate for examining social situations in flux; "qualitative studies start from the assumption that any adequate theory of communication will be historical in a dual sense: it will be grounded in the knowledge of what communication has been and how it has become what it is, and its theoretical propositions will be designed to account for this historical and comparative variation" (Christians & Carey, 1989, p. 357-358). This study will employ grounded theory methodology to examine a manifest social process. Glaser and Strauss describe grounded theory as an "an explicit method for analyzing processes" (as cited in Charmaz, 2006, p. 17). Emergent social processes often require exploratory

approaches to uncover relevancies and phenomena for subsequent study. Extant research specifically supports the examination of technological integration through exploratory and descriptive studies (Urquhart, 2007; Lehmann, 2010). Thus this research followed the tradition of scholars that, "view knowing and learning as embedded in social life" and who examine "social contexts, interaction, sharing of viewpoints, and interpretive understandings" (Charmaz, 2006, p.14; Vygotsky, 1962; Blumer, 1969; Lincoln, 2013).

The selection of a research paradigm acts as a set of parameters from which the outcome of the research is bounded. Each choice that is made in the research process can enable or constrict the path of inquiry. Berg & Lune (2012) note that "each method, thus, reveals slightly different facets of the same symbolic reality", and yet, qualitative research distinguishes itself from quantitative research on ontological, methodological and disciplinary grounds (p. 6). The ontological basis of quantitative research arises from the conception of research with "unbiased and passive observer(s) who collected facts but did not participate in creating them" and "the separation of facts from values" (Charmaz, 2006, p. 6). The etic approach of quantitative research is countered in this studies emic conceptualization of social phenomena that views reality as found in the perspective and language choices of those being studied, and places its gaze on the context that produces difference in perspectives (Baxter & Braithwaite, 2006).

Research Assumptions

The ontological assumptions of this dissertation arise from the traditions of interactionist, constructed and interpretive approaches to academic research. Quantitative methods assume "that good research aims for validity, reliability, generalizability, and objectivity (Winter as cited in Tracy, 2010). Feyerabend (1975) was among the first academicians to confront this position on epistemic grounds. Fayerabend (1978) argued that a functionalist approach imposed a

consensus of rationalization on the social world where no consensus existed and exposed value – neutral positions as absurd. This study is grounded in Symbolic Interactionism and its assumption, "that language and symbols play a crucial role in forming and sharing our meanings and actions", and where these actions account for the, "constructing [of] self, situation, and society" (Charmaz, 2006, p. 262). This approach combines a systematic view of a contingent social world, or as Abbott notes, the ferreting out of social reality, "wants a subtler wooing, it demands rigor and imagination" (Abbott, 2004, p. 4). Constructivism provides the final orientation of this research. This approach assumes that phenomena do not emerge in vacuo, but only as people share and experience them and interpret them as the basis of reality.

Qualitative Research and the Filmic Sentiment

Qualitative researchers are documentarians of culture. The documentaries they produce provide representations of the reality of social environments and offer us a glimpse into the life-worlds of the people who live there. Through their research, they produce archives of ***us*** that include elements of drama, narrative story, biography and justice, and these characteristics correspond to the filmic sentimentality. Qualitative research has been imagined as "montage" (Denzin & Lincoln 2003), "the artist" that creates montage (Tae-Sik, 2012) and even "cheese-making" (Tracy, 2010). This researcher finds the process of filmmaking as allegorical to the rigor of qualitative research and grounded theory method. In pre-production, the director relentlessly acquaints themselves with the subject matter, evaluates and summons the appropriate apparatus to tell the story, and recruits the talent that will tell the tale. If the project does not emulate resonance and relevance in the culture it represents, or for its audience, then it will never leave pre-production. Once preparations are complete (and they never quite are), then production is green-lighted, and the story begins to take shape even as filming continues. The process of

theoretical sampling and memo-ing can be equated to the viewing of daily rushes and reports from the editor. These reports provide information to the director on what course the story is taking and what is working. If the director fails to account for the implications of the rushes, the film will fail. Rewriting dialogue, adjusting for location changes – even the weather can alter the scope of the film, just as participant attrition and new research questions can in qualitative research. Finally, the director knows that the story is complete when their vision can stand up to the authentic reality it represents. In post-production, the story is crafted for an audience and a constructed reality is shared among those who create it, and those who experience it.

Grounded Theory Method

Grounded theory arose from the ambition to correct false assumptions about qualitative research and as an indemnification of its rigor and method (Glaser & Strauss, 1967). Glaser & Strauss (1967) turned away from the reproduction of theory that was the domain of quantitative research, and created a method of inquiry that revolutionized the origin of theory. Their method, grounded theory methodology, posited that theory could be found in the data of socially situated phenomena. "Glaser and Strauss's contrasted with armchair and logico- deductive theorizing because they began with data and systematically raised the conceptual level of their analyses while maintaining the strong foundation in data" (Charmaz, 2006, p. 8). Grounded theory provides a systematic and empirical method of producing a theory of naturalistic environments.

The original conception of grounded theory held rigid views on the pre-conception of theory or use of literature that have been modified in the past five decades. Strauss & Corbin (1990) revived the pragmatic and symbolic interactionist approach in grounded theory, reestablished the role of the researcher and "steadily moved from *doubt* on the independent nature of theory and knowledge and theory building" to "verifying inductively what we proposed

deductively" (Strauss & Corbin, 1990, p. 111). In 2000, Charmaz presented grounded theory from a constructivist standpoint:

> We are not scientific observers who can dismiss scrutiny of our values by claiming scientific neutrality and authority. Researchers and research participants make assumptions about what is real . . . and pursue purposes that influence their respective views and actions in the presence of each other. Nevertheless, researchers, not participants, are obligated to be reflexive about what we bring to the scene, what we see, and how we see it. (p. 27)

Despite their differences, the variations in method to produce theory from data share considerable criterion. The approach to data collection and analysis is concomitant in these adaptations as, "the analysis begins as soon as the first bit of data is collected" (Corbin & Strauss, 1990, p. 6). This process of constant comparison analysis has a specific manifestation in grounded theory analyses because of the critical conception of sampling that grounded theory is predicated upon (Hood, 2007). Theoretical sampling is the process of determining sampling strategies as they arrive from data. Charmaz (2006) explains that that the goal of theory is both an ends and a means in grounded theory because, "Grounded theorists aim to establish patterns that not only are insightful, but also demonstrate analytic precision and establish abstract theoretical relationships" (p. 213). As achieved in this study, theory can only be attained through a theoretical sampling process that continually analyzes data and then builds theory that becomes the grounds for subsequent data collection and further analysis and abstraction. The coding procedure used in this study followed from this mandate, as hermeneutic abstraction of meaning and significance was derived through stages of data analysis, until the eventual production of a grounded theory/core category/theoretical finding is identified (Holton, 2007).

Phenomenology as a Complementary Method

Phenomenology can be conceived as the experiential content of consciousness that provides a conception of reality and being (van Maanen, 2014). Phenomenological research seeks to identify the lived-experience of individuals in social situations in order to identify the essence of their experience. The addition of phenomenology as a complementary method in this study greatly improved the perception and analytical rigor for the building of theory from data. "GTM developed by Glaser and Strauss failed to distinguish between data and phenomena. Despite evolutions over time, GTM still bears its methodological weaknesses: insufficient descriptions of individual participants and phenomena" (Tae-Sik, 2012, p. 71). Grounded theory has a focus on data and theory that can mask the personhood of participants from the view of the researcher. In order to increase the richness of the data from which a theory of student-teacher-parent relationships and technology can arise, this study include a phenomenological stance in data collection and analysis. Though utilized as a complementary method, K-2 teachers are a strong cohort of built on trust and shared experience that carries significant relational weight. The incorporation of phenomenological research sensitivities informed the understanding of the experience of the participants in this study and allowed for a greater unfolding of their engagements as data to be grounded in theory (Moustakas, 1992). Interpretive Phenomenological Analysis (IPA) provided the basis for this approach as a result of the procedural similarities to GTM (Smith, Flowers & Larkin, 2009). Complementary methods added breadth to this study and rigor to the collection and analysis of data (Tracy, 2010).

Research Procedures

This study proposed three interactions with participants to collect and examine data that is representative of the phenomena studied. The study sought data from the participants through

an initial face-to-face interview, an elicited self-report journal, and finally through a member checking interview procedure. The participants targeted for the study were K-2 schoolteachers recruited from public or private schools that integrated multiple types of technology in the classroom.

An initial face-to-face interview was conducted with each of the 28 participants. The initial interview was followed by the immediate dissemination of the elicited text Journal that had self-contained prompts, and were instructed to record activities that were relevant to the phenomena of study for a period of two weeks, or when eight -ten entries were satisfied. 25 journals were collected from the participants, with three journals left uncollected due to attrition. All of the data collected for this study were achieved during the 2018-2019 academic school year. 16 member-check interviews took place after the grounded theory and the two theoretical codes emerged and when the research question could be satisfactorily answered. All member check interviews took place over the phone, though Skype was offered as an option.

The use of multiple methods of data collection was intentional and designed to deliver unique perspectival data. Initial interviews were open, conversational and responsive, and include open-ended questions, looping and other interviewing best practices (Kvale, 1996; Rubin & Rubin, 2006) The reflective nature of interviews were supplemented by journals that could offer an immediate reaction from participants as they encountered technology in situ. Finally, member-check interviews provided a contextual examination of the data in the reflection of the participants, adding awareness and insight (Vagle, 2014).

Participants, recruitment & sampling

Overview

The selection criteria for participants in this study include; (a) teaching in a public school or accredited private school (b) teaching Kindergarten, 1rst and 2nd grade (c) teaching for at least six months and most critically (d) teaching in a school that has integrated multiple technology. This final criterion was defined as including, but not limited to; whiteboards, computers, digital game play, software –based learning, television/DVD, ICT-based flipped learning, virtual field trips, 3-D printing (Modern, 2017), and/or, parent-teacher apps such as Parent, Schoology, Teacher Kit, Seesaw; Learning Management Systems; and traditional social media platforms). Teachers must all be over 21 and hold an up-to-date teaching certificate in the State they are teaching in.

Recruiting and research sites

The participants recruited in this study all met the criteria as noted in Table 1. This study did not seek out gender or race equity as a criterion for inclusion or exclusion. However, the teachers were racially diverse but their gender was homogeneous, with only one male participant. However, this outcome is not unexpected based on the average penetration of males as K-2 teachers.

Recruiting strategies were undertaken to identify key informants that might connect to teachers, through the researchers gatekeepers, and through snowball sampling. However, many teachers were reluctant to take part in university research without approval of their superiors. Consequently, the researcher sought out and received the approval of district superintendents that provided official letters, which approved teacher participation at the district level. No commitments were made other to the district, other than providing the district with a completed

copy of the dissertation upon its completion. Once these permissions were attained, the recruitment of teachers proceeded expeditiously. In total, 28 teachers were recruited from a pool of 36 email respondents. Teachers that were chosen were based on selection criteria and theoretical sampling. Once recruited, each participant was sent an informed consent document prior to the initial interview. At the initial interview, the teachers signed the informed consent document, were provided a stipend in the form of a $50 Amazon card and the interview then commenced.

The proposal for this research included both suburban communities in the mid-Southwest and in the Midwest. However, due to the reticence of teachers without superintendent permission, all but one participant was recruited from the mid-Southwest. The participants determined the physical research sites of the initial interviews. 22 initial interviews were done at the teacher's school, three interviews were at public library reading rooms and the final three were collected in coffee shops.

Theoretical sampling

Sampling in grounded theories start with a phenomenon of interest but theoretical sampling further qualifies criteria for inclusion in the study, contingent upon data collection and analysis results. In this study, there were several small adjustments made to the approach to the research and one significant change as a result of theoretical sampling. First, it became evident early on that teachers did not have a fundamental scarcity of technology, as was postulated in the choice of suburban schools. Instead, they faced challenged with the implementation of relevant technology and encountered several dilemma to cause an abeyance in the implementation of technology. This knowledge redirected the order of questions in the protocol. The second adjustment came as a result of learning that participants have widely differing relevancies for the

three areas of interests/RQ's in the study. Therefore, the interviews began to follow rather then lead on the subject matter, though all areas were addressed eventually, and this strategy paid dividends of trust and engagement. Third, several small adjustments were made through notation and memo-ing to the looping strategies as patterns emerged from the data. It should be noted that there was never a teacher that did not fit the general expectation of the study, but each offered insights into the myriad adjustments to understanding the phenomena and the path to theory.

The major theoretical sampling result of this study came from the addition of a single word to one research question, but this change resulted in one of two theoretical codes from this study. After several interviews, it became totally evident that the participants did not see the significance of technology on the relationship between the teacher and student, without including the effects of this dynamic on the parent's relationship with both the teacher and the student. At that time, the theoretical code had not emerged, but the hyphen and the word "parent" was added to the third research question. In addition, the third research question, which had been separated into two parts as "influence" and "adaptation", was combined. This change was critical to the eventual finding of the Interdependent Stakeholder Model, as will be explicated in the Findings of this study.

Participants

A purposive/snowball approach that incorporated key superintendent gatekeepers identified 28 teachers chosen for their fit to criteria These participants provided the basis for relevant data, and the aforementioned theoretical sampling (Eisenhardt & Graebner, 2007). As noted in Table 1 participants provided a diversity of experience of teaching, grade level and as hoped for in the design, all participants had experienced an influx of technology into their teaching experience over a period of time that signaled their relevance as informants of the

phenomena of study (Table 1). Teachers in this study had a broad range of experiences that brought them to their jobs as teachers, but they shared the motivation of wanting to help children how to learn. The suburban sites of these schools can be said to be middle class to upper middle class and teachers had much the same characteristic to the schools they were teaching in. Many of the teacher participants had attained a Masters degree or intended to seek one. Finally, the researcher had the distinct impression that the participants welcomed the opportunity to speak to the issue of integration of technology, and were eager to talk with someone who was interested in their perspective about the ramifications of technology.

Table 1

Demographic and Relevant Study Information

Name*	F/M	Grade Level	Influx	Experience	Data Collection
Bonnie	F	1	2012	14 years	I – ET - MC
Sophia	F	K	2014	8 years	I - ET - MC
Pat	F	2	2014	8 years	I - ET ***- N/A***
Tonya	F	K	2016	5 years	I - ET - MC
Ross	M	1	2014	6 years	I - ET - MC
Wanda	F	1	On Entry	3 years	I - ***N/A- N/A***
Yara	F	2	2015	17 years	I - ET - ***N/A***
Umi	F	K	On Entry	3 years	I - ET - MC
Quinn	F	K	2012	17 years	I - ET - MC
Val	F	K	2014	5 years	I - ET - ***N/A***

Amara	F	K	2013	25 years	I – ET - MC
Mia	F	K	On Entry	6 years	I - ET - ***N/A***
Xiu	F	2	On Entry	4 years	I - ET - MC
Cate	F	1	2015	25 years	I - ET - MC
Heidi	F	1	On Entry	2 years	I - ET - **N/A**
Denya	F	2	2014	12 years	I - ET - ***N/A***
Elsa	F	K	2014	24 Years	I - ***N/A***- MC
Farrah	F	2	***N/A***	11 Years	I - ET - ***N/A***
Gina	F	2	2015	25 years	I - ET - MC
Inez	F	1	2013/2015	7 years	I - ET - MC
Juana	F	2	***N/A***	12 years	I - ***N/A –N/A***
Kim	F	K	2012	8 years	I - ET -MC
Lucia	F	2	2013	11 years	I - ET - MC
Mischa	F	1	2013	22 years	I - ET - ***N/A***
Nadia	F	2	2013/2015	6 Years	I - ET - MC
Opal	F	2	2013/2016	16 Years	I - ET - ***N/A***
Zoey	F	1	2013	9 years	I - ET - ***N/A***
Toni	F	2	2014	12 years	I - ET - MC

Data Collection Key: I= Initial Interviews (28), ET= Elicited Text Journal (25),

MC= Member Check (16).

Influx: Approximate Dates of New/Mobile Media integration

* All name are pseudonyms in order to maintain anonymity

Data Collection and Analysis

Data Collection and Analysis Procedures

Interviews for this study were recorded on the TASCAM DR-05 field recorder. A secondary recording as collected on an iPhone 7 using the Hindenberg Field Recorder application. Data was encrypted on a 2 TB dedicated drive kept in the home of the principal investigator and mirrored to a drive kept in a fire safe. Data was coded using the NVivo10 software on a Macbook Pro computer. Both the computer and the NVivo documents were password protected.

Initial Interview Data Collection

The first phase of data was collected from early November of 2018 – January of 2019. These interviews had a steady flow, though there was several days that more than one interview was taken. As noted, the interviews followed the agenda of the participant, but were managed by the interview guide included in the appendices. The questions in the research guide mirrored the three areas of the research questions from the study. Thus, each initial interview might start on a different area of participant interest, and would move to the other two areas of inquiry. Participants were asked questions about their evaluations of technology integration, regarding the ways in which technology had changed the process of teaching, and in what ways the integration of technology was influencing the teacher-student-parent relationship (Appendix 1). The length of the interviews lasted between 66-76 minutes with the exception of two interviews that lasted 46 and 51 minutes due to participant scheduling issues. As noted, the interviews took place in the teacher's school, the public library, or in 3 cases at a coffee shop.

According to the GTM methodology, data transcription and coding began immediately. In addition, the researcher kept a brief memo after each interview, or interview day, to keep a

record of his impressions. The researcher transcribed all the data from these interviews. As noted in the theoretical sampling section above, each interview resulted in the sharpening of questions and in particular the looping of responses, as the knowledge of the researcher was strengthened. This layering of questions was a beneficial strategy for the uncovering of teacher concerns, because the participants introduce an area of focus rather than the researcher. Teachers are naturally prone to explaining concepts and as a result, looping became a critical means of uncovering data. In some ways, the researcher was "taught" the data and the substantive information, rather than being the instigator of questions.

Elicited Text Data Collection

At the conclusion of each initial interview, the researcher provided participants with a spiral notebook. Inside each spiral notebook was a prompt card that explained the expectation for the elicited text in writing (Appendix 2). The researcher also went over these instructions verbally. The researcher asked the participant to use the email from the recruitment, or his phone number, to contact when complete. The retrieval of these journals was not a simple matter and it took some time to get some of the journals completed. Nonetheless, the data collected produced the expected results as teacher participants discussed the effects of technology in the classroom with immediacy and with a heightened sense of urgency. In total, 25 journals were completed. Most journals were written as expected and journals averaged about 8 pages each. However, some teachers took the opportunity to do more extensive journaling. In the end, 181 pages of additional data were collected.

Data Analysis

Data analysis included a traditional 3-phased approach of grounded theory methodology and produced the eight themes and two theoretical codes in the Findings section of this

dissertation. Data collection started with notes taken in the initial interview. These were mainly procedural and also noted emotive or other content that could not be picked up on the tape recording. A brief memo was also written for each day that the researcher collected data during initial interviews. Finally, the arduous task of transcribing the data from the interviews could take place. This was by far the most time-consuming aspect of the data analysis tasks, and the researcher is deficient in typing skills. However, it is believed that this "slow" transcribing became an asset to the outcomes as the researcher had to take considerable time with the data during transcription. Finally, to gain additional knowledge of the data, the researcher listened to interviews during his 1-hour commute to and from work each day.

This study produced an exceedingly rich data set with virtually no "fluff" in participant answers. Teachers are both verbose and trained to be relevant. As a result, the data collected was dense and rich with relevant material. The results of the 28 initial interviews were both compressed and prolific. The transcripts of each interview ranged from 22-34 pages. NVivo software was utilized for the coding of this study, though none of the search queries were utilized and only the codes identified by the researcher were included in the findings. A "chunk" approach to coding was taken where the size of a code was determined by its relative meaning and density. Thus, there are codes that are 1 sentence and there are codes that are almost a paragraph. As data analysis proceeded through the 28 interviews and journals started becoming available, the initial data analysis produced more than 4000 codes. Because of the volume of codes, a strategy to use topical codes as placeholders was undertaken. These topical codes, such as "self-perceptions" or "training" were generalized topics that where then re-coded as analytic open codes. Initial results yielded 82 topical and analytical codes. Eventually, these were iteratively coded to 40 open codes that produced eight focused themes. Each theme also had a

memo that supported its premise and development. The final few journals were collected and several iterations of themes and codes were constructed, condensed and abstracted to eventually arrive at the thematic findings reported in this report. Two theoretical codes were produced that accounted for the extant data and satisfied un-coded material as it was analyzed. The grounded theory, theoretical codes and themes offer explanatory accounts of the phenomena and the data.

Member-check

Once the theoretical categories were identified, member checking of participants was initiated. 16 participants provided member-check interviews that averaged 18 minutes in length. Theoretical codes and their supporting themes were explained to the participants who were encouraged to provide genuine and constructive commentary. For the first theoretical code (RI/AA), thirteen participants were asked about the proposed finding and all thirteen participants supported this finding, as well as several themes and features of the theory. 1 participant conditionally agreed with a theory, and incidentally the condition was a limitation listed in the discussion section. The second theoretical finding of ISM, found similar results with fifteen of fifteen agreeing with the theoretical code findings and the themes that supported it.

Validity and Reliability

The reliability of this research is supported in Table 1, which confirms that the phenomena of study - integration of technology in the K-2 classroom - has been examined in the experience of the study participants. The validity of these findings is premised upon the eight Creswell (2007) measures for increasing credibility and validity in qualitative research. This research incorporates several means of building credibility into its design. During data collection, triangulation of data collection methods and sound data management were undertaken (Creswell, 2007). The inclusion of member checking provides a clear means of asking participants the

validity of the findings, as they are have direct experience in the setting of the phenomena studied (Guba & Lincoln, 1985). Thick description is the process where significant data are included in research reports so readers can make their own evaluations regarding the connections made by the researchers (Geertz, 1973). This dissertation rigorously employs thick description in the findings section of this study in order to increase the validity of results, and to give voice to the participants of this research and dissertation.

Conclusion

This method chapter includes the ontological suppositions for the research enclosed and the procedures were followed to address the problematic, answer the research questions and generate a grounded theory from data. This research and this the researcher aimed for the high bar of Tracy's (2010) criteria for qualitative research as its roadmap for the production of this inquiry and findings; "In this article, I have made a case for and presented an eight-point conceptualization of qualitative quality that includes; (a) worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence. These markers provide a common language of excellence for qualitative research and a useful pedagogical compass. They can help us engage in dialogue with power holders who might otherwise regard qualitative research as just a good story (p. 849). The following findings are offered as an example of this ideal and an exemplar of these methods.

Chapter 5 Findings

Overview

The research that supports this dissertation examines the integration of new/mobile technology in K-2 elementary schools and is centered on early educator experiences and understandings. The methods section of this document provided details regarding the participants, research sites, and the qualitative methods chosen to elucidate the research questions. A grounded theory approach that incorporated constant comparison and theoretical sampling was used to collect and interpret data, and a three-phase coding process produced the following findings.

The goals of this study were to comprehend teacher appraisals of new/mobile technology integration on: (a) the achievement of learning objectives- RQ#1 (b) the process of the teacher and teaching - RQ#2 and (c) the influence of the integration of new/mobile media on the student-teacher- parent relationships- RQ#3. New/mobile technology and media have a history of being incorporated into educational and learning environments as these technical innovations become available. However, new/mobile technology made a significant penetration into K-12 schools in the period from 2012-2015. This wave of technology integration has been more prevalent in suburban schools where comparatively more financial resources are available to make transitions to instructional technology. Consequently, this study targeted suburban school districts for participation and participant recruiting. Table 1 in Chapter 4- Methods includes the calendar year that each participant self-reported the influx of new/mobile media such as the use of I-Pads, the incorporation of "apps", as well as the use of screener programs for assessment and differentiation. Participant reports of new/mobile media penetration (Table 1) provide reliability that the intended phenomenon of study has been examined.

Summary of Findings

This study has identified two theoretical findings and eight themes that support them. These findings address three research questions, and explain the phenomena of study (Figure 1). *Recursive Identity/Agency Adaptation (RI/AA)* represents the primary theoretical finding of this research and encompasses both RQ#1 - teacher evaluation of the integration of technology on the ability to achieve desired learning objectives, and RQ#2 - the effect of technology integration on the process of teaching and teachers. This first theoretical code includes six of the eight themes in this study (Themes 1-6) and posits that K-2 teachers recursively adapt to the integration of new/mobile technology though the management of resources and maintenance of identity. Additionally, the findings showed that a discordance of educational outcomes provides a feedback loop to this recursive adaptation (Figure 2).

The secondary theoretical finding from this research is the *Interdependent Stakeholder Communication Model*. *The Independent Stakeholder Model* (ISM) addresses RQ#3 – the influence of technology integration on the teacher-student-parent relationship. The second theoretical code entails two of the eight themes (Themes 7-8) from the findings (Figure 1 & Figure 4). The ISM proposes a participation dependent model of communication between classroom stakeholders primed through the alteration of relationship in the classroom and through cultivating an ecology of media in schools and school districts (Theme 7 and 8). The ISM describes a communication model that compresses time, virtualizes distance, and clarifies the content and context of messages when compared to the traditional/tri-linear model it supersedes. Stakeholders that participate in the ISM through integrative applications are communicating iteratively and collaboratively for the purpose of synchronizing interaction, enriching communication practices, and advancing student achievement and affirming student

success. (Figure 4). Member-check results for this study were reported in Chapter 4- Methods, but a summary of member check results for each research question will be included at the end of each research question result.

Theoretical Finding #1

The Grounded Theory of Recursive Identity/Agency Adaptation (RQ#2)

This study examined teacher experiences with new/mobile technology and assessed the manner in which the integration of technology impacts the work of educators and their professional relationships. Data collection and analysis of 28 teachers interviews, 25 elicited text journals and 16 member-check interviews produced 2 theoretical findings. The first of these findings establishes a relationship between six focused codes, or themes, and produced the grounded theory of *Recursive Identity/Agency Adaptation* (RI/AA). RI/AA serves to address: (a) RQ#2, the effect of technology integration on the process of teaching and teachers (b) and includes RQ#1, teacher evaluation of technology integration on educational outcomes as a feedback loop to the mechanism in RQ#2. *Note:* RQ#1 is also addressed independently from the RI/AA theory in order for the study to adequately answer each research questions with clarity.

Recursive Identity/Agency Adaptation (RI/AA) (Figure 2)

Recursive Identity/Agency Adaptation (Figure 2) theorizes a relationship between six independently identified themes. These themes were produced through open and focused coding and resulted in the grounded theory of RI/AA from selective coding (Charmaz, 2000). The six themes that comprise RI/AA represent two areas of recurring behavior that K-2 teachers strategically employ in order to adapt to the integration of technology in the educational environment. The theory also includes a feedback loop precipitated by teacher's implementation

of technology in the classroom (Figure 2). RI/AA theorizes that early educators are simultaneously experiencing a fundamental change in the practices through which they: (a) manage resources that construct their professional practices, (b) maintain their identity as educators and (c) deliver the desired learning objectives for their students. The data collection and analysis from this study supports the theory of RI/AA and its postulate, that teachers have been cast into a state of adapting and re-adapting to the integration of new/mobile technology as a means of providing consistency and structure to their professional performances and relationships.

RI/AA postulates that early educators are experiencing a re-prioritization of their value and achievement inside the classroom, as well as a redefinition of the expectations placed on them to communicate with educational stakeholders. Tonya, who experienced new/mobile technology integration in 2016 explains:

> I learned that technology is just a great way for collaboration that teachers use to communicate and share ideas - and to collaborate with parents - collaborate with admin, - collaborate with people outside of the school building and across the world. Although I used to be so against it . . .Sometimes you have to step down and think about the big picture. (Tonya, mq 20-8)

Quinn explains the vertiginous rise in expectations:

> I wish there was a 'black book' of what they really want us to teach them or expose them to. And when I say 'them', I don't even know who the 'them' is. I don't know if it's within our district or within our building… at the capital, I don't know. But I just wish as a teacher and as a mom, I wish we really knew the expectations. (Quinn, mq-3)

Figure 1.

All Research Findings

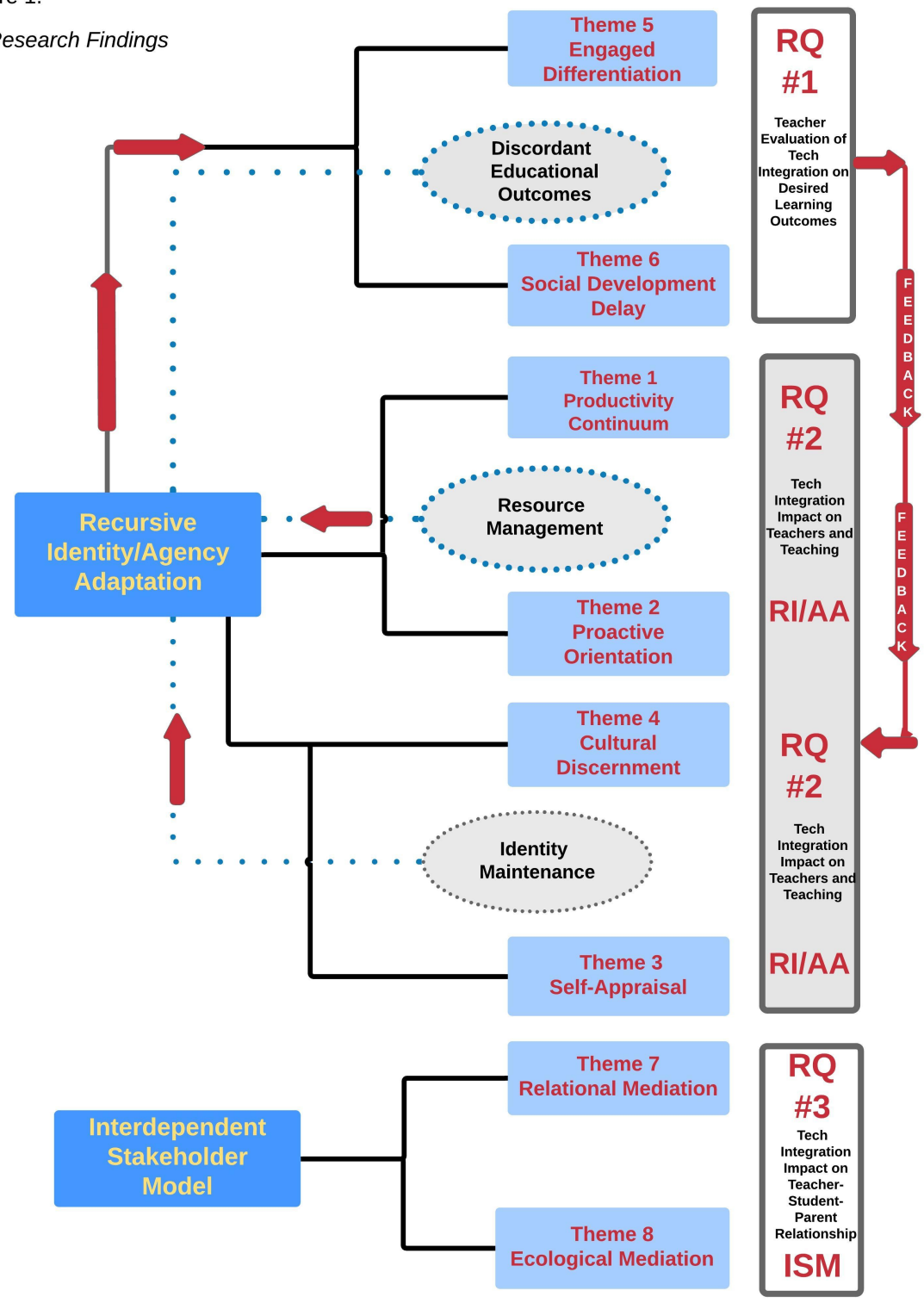
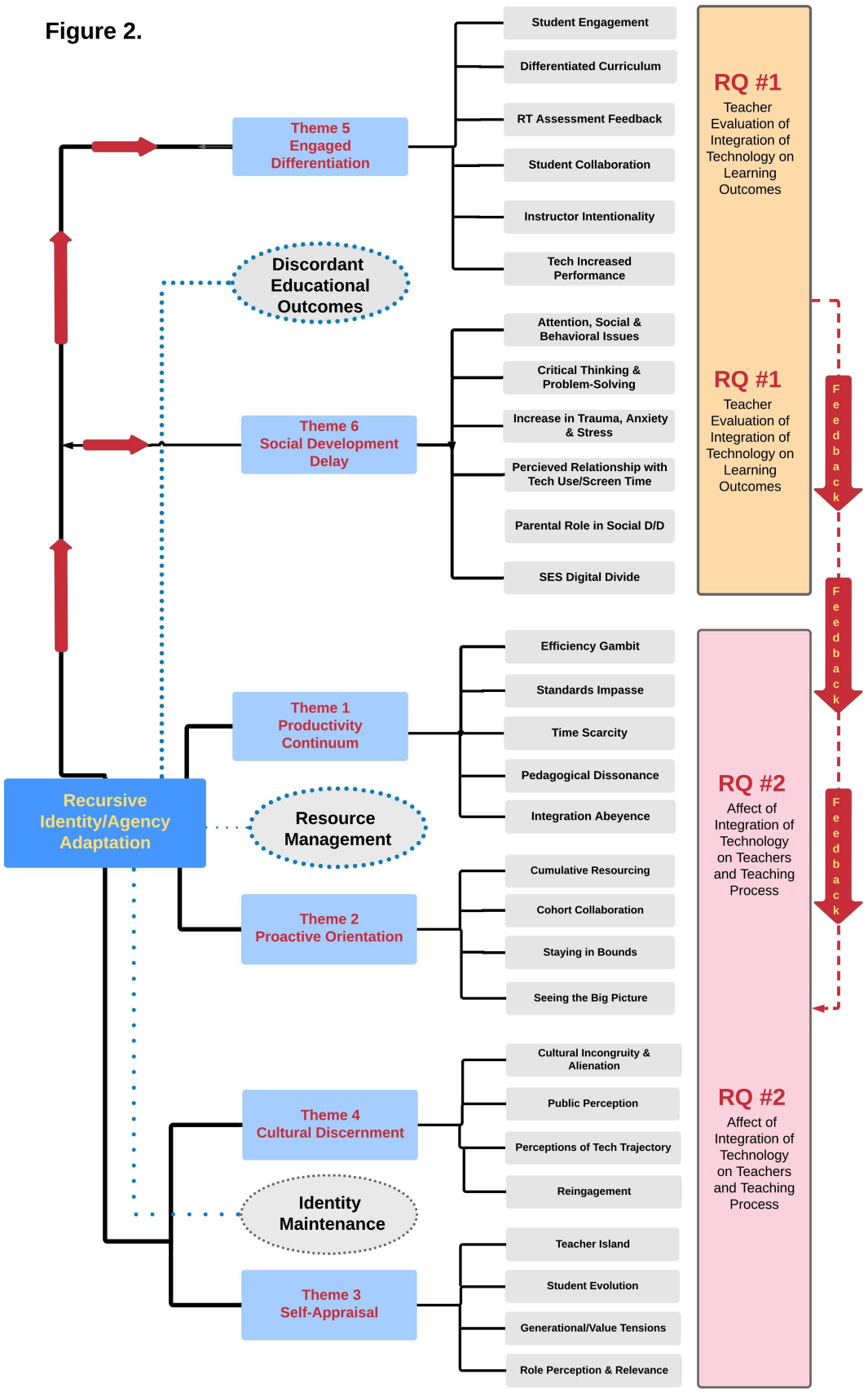


Figure 2.


Recursive Identity/Agency Adaptation
Theme 5 Engaged Differentiation
Student Engagement
Differentiated Curriculum
RT Assessment Feedback
Student Collaboration
Instructor Intentionality
Tech Increased Performance
Discordant Educational Outcomes
Theme 6 Social Development Delay
Attention, Social & Behavioral Issues
Critical Thinking & Problem-Solving
Increase in Trauma, Anxiety & Stress
Percieved Relationship with Tech Use/Screen Time
Parental Role in Social D/D
SES Digital Divide
RQ #1
Teacher Evaluation of Integration of Technology on Learning Outcomes
RQ #1
Teacher Evaluation of Integration of Technology on Learning Outcomes
Feedback
Feedback
Theme 1 Productivity Continuum
Efficiency Gambit
Standards Impasse
Time Scarcity
Pedagogical Dissonance
Integration Abeyence
Resource Management
Theme 2 Proactive Orientation
Cumulative Resourcing
Cohort Collaboration
Staying in Bounds
Seeing the Big Picture
RQ #2
Affect of Integration of Technology on Teachers and Teaching Process
Feedback
Theme 4 Cultural Discernment
Cultural Incongruity & Alienation
Public Perception
Perceptions of Tech Trajectory
Reingagement
Identity Maintenance
Theme 3 Self-Appraisal
Teacher Island
Student Evolution
Generational/Value Tensions
Role Perception & Relevance
RQ #2
Affect of Integration of Technology on Teachers and Teaching Process

Expectations placed on K-2 teachers are broadening in scope and increasing in intensity as technology integration occurs. K-2 teachers are experiencing increased expectations for "in-grade" partnering, between grade "verticals" that ensure grade level transitions, a revitalization of the teacher-student relationship, and they now manage an explosion of expectations in parent-student communication and feedback. Elsa provides context, "I wear every hat- parent, counselor, shoulder to cry on, encourager, and that's just to the parents. I give advice. You need me to wear a hat? Then that's what the teacher wears! [I'm] educating the children and giving them the best education they can have, and making sure they're prepared . . ." (Elsa, mq 5-1). Correspondingly, the expectations for academic performance in K-2 students is substantially escalating through triangulated academic standards and mandated curriculums. Teachers come to identify the integration of technology in K-2 classrooms as the primary source of their intensifying performative and communicative obligations. Juana notes that, "Our principals pushing for us to use technology because we have it, and they don't want it to just sit in our rooms. She's trying to make sure that we're constantly thinking technology" (Juana, mq-2). Gina, a 10-year veteran of the K-2 classroom notes:

> The reality is, if you want technology, you've got to figure out where it's coming from . . .and what you want. It's pretty much up to the teacher . . .I go to technology conferences. I follow a lot of blogs and Instagram things that advertise different technologies. I am a go-getter when it comes to technology. So when I want something, I will figure out a way to get it. (Gina, mq6-1).

Academic standards, increasing curriculum demands and standardized testing through the integration of technology, are threatening resources and placing additional skill demands on early educators. The integration of technology, standards and curriculum has been

accompanied, in part, through a shift in emphasis from the holistic preparation of the student, and has now been displaced by a priority of ever-increasing standards and testing regimes. Toni explains how these practices impact teachers, "You not only have to teach last years standards and make sure that they [students] know them, but make sure that you get them to the same level as the rest of your team . . .and if you have a rocket scientist kid- you have to up your game. It's an awesome responsibility" (Toni f3b-4). Additional standards and integration of technology effectuates technical demands that apply pressure to early educators core professional responsibilities. As a result, the process that teachers use to assess and record student performance and differentiate individual academic intervention continues to evolve, while technical integration and transitions persevere. Necessarily, teachers also must adjust their pedagogical practice by incorporating instructional technology strategies that respond to the curriculum demands of the contemporary K-2 classroom. Denya notes that, "it's just challenging for the students, the teachers, to balance all of that, to incorporate the expectations from district, along with the school expectations, and then to be able to put that aside and say, what does the student need?" (Denya, tr4).

RI/AA posits that teachers are recursively adapting to technology integration through two practices, the first of which is resource management. Integrating new/mobile technology in the K-2 learning environment reorients the resources that teachers require in order to perform their professional practices. As technology and standards become the priority of curriculum for developers and school districts, the conception of the exemplar teacher comes under scrutiny. In order to keep pace with this transition, teachers must achieve mastery of new technologies and diversify their own efforts to acquire current resources and knowledge. Elsa describes how things are changing, "OK - so I mean, they got to have technology . . . I mean, I just wrote a grant for

coding equipment! - So I mean, it's just a big deal. So with technology - you can't go backwards. We're just lurching forward with it" (Elsa, tr5).

Teachers respond to unfamiliar technical demands by incorporating new resources into their own professional practice as they simultaneously maintain existing goals. Teachers seek out collaboration in order to increase their knowledge base and broaden their support. This proactive seeking of support is described by Juana:

> A lot of teachers don't even know how they can use it in their classroom. It's only when we sit down to collaborate as teachers that I can show somebody else what I'm doing, and they can say, 'ooh, I like that' Then they say, 'But you know what? I can also use it this way,' - and then I say, 'I hadn't thought about that'. And we both say, 'Hey- we could also use it for this, too!' So, constantly bouncing ideas off each other. (Juana, tr10)

As teachers confront technical and pedagogical processes that require additional skills, they pursue supplemental training in order to remain effective in the classroom and maintain relevance in their professional cultures. Umi attended one such training and offers insight into the process of teachers obtaining technical knowledge:

> During this third and final day of guided inquiry training, I have to say I am surprised and excited about the plans we have developed to incorporate technology into this long -term project. Our librarian has been here to collaborate . . .using research skills and instructional technology that can be implemented at the K and pre-K levels. (Umi, tr21)

Finally, teachers diversify their resources by seeking out technique and knowledge wherever they can find it. Numerous external sources support a diversification of information and knowledge such as, websites, databases, professional development opportunities, and social media. Xiu explains how she tackles this ongoing challenge:

> If I come up with an issue? I have a have a problem or I want to know something -I immediately go searching. I try to find out the answer. I know that there's tons and tons of great free trainings that people have on the Internet. There's *Miller's Ditch*- that textbook, and he's got, like, a whole website full of technology, trainings and tools. And there's the *Southern Cross*, Alice Keiller . . .she's got a bunch of Google trainings and tools, and even [City name] has all kinds of different self-paced trainings that you can go through. (Xiu, tr24)

The second area of recursive adaptation that RI/AA theorizes occurs through identity maintenance. Teachers are coming to terms with a changing professional culture, evolving student expectations, and the redefinition of their own professional practices**.** Early educators are adapting to these shifting realities and what it means to be an educator by making adjustments to maintain their identities. Each teacher adapts to these new expectations at different rates of change and through a unique lens of experience. Resulting generational and value tensions produce a diversity of opinions over the emerging role of the K-2 teacher. These antagonisms can be acute, "from what I've seen there are two types of teachers - the ones that want to ignore what's happening with technology, and the ones that really want to make sure that our kids are ready for what they're going to be expected to do" (Kim, f5c-1).

Teachers make self-appraisals about how they might fit into the changing landscape of the technically integrated classroom. These assessments are coupled with an inquiry into the culture that they must situate themselves in as the most iconic and visible of public servants. Yara speaks to these challenges, "I think one big thing is to go back to trusting teachers, to be able to teach what they *know* that they should be teaching - and that *they* can fit it into their schedules". Yara captures the sentiment that teachers are no longer autonomous as they once

were, and continues, “instead . . . right now, I think there's a big part where there's no trust”. Yara finishes her thoughts by discussing her frustration over how teachers are treated in the public sphere, “It’s why politicians pass legislation, because they don't trust that the teachers know, *really*, what they should be working on, and that *they* need to tell us what to do” (Yara, tr25). Mixed external attitudes, the evolving student and the aforementioned resource demands all call to question the teacher’s sense of self that is addressed through identity maintenance.

The final aspect of RI/AA is theorized as a feedback loop that develops from teacher performances that is manifest as the outcomes of integration of technology and “feeds- back” to the recursive adaptation posited by RI/AA. Research question #1 asks how teachers evaluate the integration of technology to attain the desired learning objectives. The data and analysis from this study support discordance in teacher evaluations of technology integration. Participant teachers lauded the academic benefits of technology integration, and yet, they were troubled about the lack of impact of technology on the social development of their students. The resulting discordance provides a feedback loop where these views can be managed by recursive adaptation. As is discussed in the result of RQ#1, teachers utilize resources and perform their identities as they integrate technology in the classroom. The discordant results of this integration of technology generate additional opportunities and needs to manage resources and maintain identity trough recursive adaptation (Figure 2). The need to undertake these adaptations is magnified by the deep desire of teachers to teach, “the whole person” (Opal, tr15), and as Ross explains the “three focus areas that I really place my efforts on . . the academic, the social, and then the emotional” (Ross, tr18).

When teachers experience the lack of development, or decay of social skills in their students, they react by making accommodations to their resources and identity, as theorized by

the feedback loop. Wanda describes the condition of one of her students who is experiencing development issues and she asks, "Why are you grumping at me? Oh, are you hungry? Did something happen in your home last night?" – she goes on to clarify that, "I have to go through all of *that* before we can even get to teaching" (Wanda, f2c-4). Wanda then describes how she makes an adjustment to her identity to deal with these issues: "We do have a lot more put on us. We're no longer just teaching, which is enough. We also have to be the social worker in the class and the nurse". Finally, Wanda describes the external cultural discernment that teachers face when managing their identities and she describes how, "People say, 'Well, that's not your job' - Well, I can't *get* to my job until we've cleared through this muddy water. Right? So it <u>*is*</u> my job" (Wanda, f2c-4).

Nadia adds to Wanda's revision in her self-perception as a teacher when she exclaims, "I want to help all those kids so much, but I just can't do it all the time. I think it just kind of made me realize that the work I am doing is beneficial, even if I can't get them where they need to be academically" (Nadia, f1b). These tragic events create a disconnect between the priorities of schooling and how the teacher manages their expectations and reevaluates their role in a state of recursive identity maintenance. The reorientation of identity is mirrored by the management of resources teachers utilize in the classroom.

Ross experiences the same issues that Nadia and Wanda are facing, but his response includes assessing capabilities and adjusting to the resources that can help his students. He comments that, "it definitely helps provide a perspective when you go through struggles, when you go through certain things - you get to see students . . .where they're at because you just want to be able to provide everything you can for them" (Ross, f1b-1). Val clarifies that as social development issues persist that teachers must respond through their profession practice:

> Teachers are really having to pick up the slack. Because as a child, how are you going to come into a classroom and be engaged and focused on learning, if you just saw the cops arrest your dad last night - or you haven't eaten since lunch at school the day before. (Val, f2b-1)

Member Check Results for- RQ#2/RQ#1: RI/AA and Feedback Loop

This study includes member checking as a third layer of data and to provide a measure of validity to its findings. For RI/AA- RQ#2 and RQ#1 thirteen participants were queried about the findings of RI/AA, Management of Resources, Identity Maintenance and its 6 attendant themes. All thirteen member-checks agreed with the findings of the research for RQ#2/RQ#1. Member check interviews supported the RI/AA and/or elements of the RI/AA that addresses RQ#2 and the feedback loop of RQ#1. 1 comment agreed with the theory of RI/AA, with the condition that is was not exclusive, a caveat also posited by the theory. Participants specifically confirmed the RI/AA features of: recursive adaptation, structural change, the productivity continuum, proactive orientation, identity maintenance, diffusion of resources and the description of teacher-island.

Recursive Identity/Agency Adaptation is an accounting of how K-2 teachers are responding to technology integration and increasing expectations on their performances as educators, the redefining of what makes "a teacher" a teacher, and the reprioritization and escalation of student academic performance standards. The grounded theory of *RI/AA* posits that teachers are making adaptations to their resources and identities, and that discordant educational outcomes provide a feedback loop that exemplifies this process. RI/AA was developed as a

relationship of six themes grounded in data collected from 28 teachers. In order to adapt to technology integration, early educators recursively adapt to technology integration through:

Δ Resource Management

- Theme 1*:The Productivity Continuum*
- Theme 2: *Proactive Orientation*

Δ Identity Maintenance

- Theme 3: *Self-Appraisal*
- Theme 4*: Cultural Discernment*

Δ Discordant Educational Outcomes: (*Feedback Loop)*

- Themes 5: *Engaged Differentiation*
- Theme 6: *Social Development Delay*

The remainder of the *Theoretical Finding #1* section will provide an explanation of each pairing of themes, will explicate and defend each theme through thick description and then, defend how each theme is internally cohesive. Finally, an explanation of how these themes buttress the grounded theory of Recursive Identity/Agency Adaptation, will be undertaken.

Resource Management

The integration of new/mobile technology in schools has generated the addition, substitution and inclusion of additional technical resources in the K-2 classroom. These technical revisions include hardware such as I-Pads and Chromebooks, software and applications, and assessment/screening programs. The use of these technical tools create efficiencies in assessment and differentiation, and provide the means for fostering engagement and participation in the students that teachers are tasked to educate. However, each of these revisions in process also

provides another demand for teachers, who must learn how to effectively utilize and relevantly apply them to maintain their professional standards and educational outcomes.

Participant data in this study explicate how teachers make adjustments based on the availability and saliency of the resources that are made available to them. Teachers must innovate in order to remain relevant in the classroom. Val discusses her strategy for increasing the integration of technology in her class, "We were able to really get more things to differentiate for our students. We were able to acquire a lot more technology because we could go to our PTA and because we new the PTA would give us money to buy different things" (Val, f4a-1). Educators are reflective about evaluating how they might amend practice and adjust to technical resources to maintain their educational goals. These assessments provide additional pressure to the teacher who is already struggling with time management issues; "I think the biggest resource that is lacking is time. There's just not enough time. I mean, I teach eight hours a day and then if I want to be like - a really phenomenal teacher - I have to spend hours upon hours after school, trying to figure out a plan for things" (Xiu, f3c-1).

As each program or application is integrated into learning exercises, teachers must become familiar- not only with the operation of the technology itself – but must also calculate applicability to grade level, and the incorporation of technique into lesson plans and classroom management strategies. Finally, as technical innovations increase, the extant knowledge of teachers is decreased in its applicability, and the teacher must learn to manage evolving resources or risk stagnation, isolation or irrelevance.

The two themes that encompass the area of Resource Management are *The Productivity Continuum* and *Proactive Orientation*. The Productivity Continuum describes the instability and inconsistency of provision for professional resources during integration of technology, and the

corresponding effect on teachers as they work in this environment. K-2 teachers are simultaneously expected to manage the instability of resources while achieving a stable delivery of learning objectives. *Proactive Orientation* describes the diverse adaptations that teachers devise in order to accommodate to the change and uncertainty of the productivity continuum.

Theme 1 The Productivity Continuum

The culture of increasing technical and organizational demands that are prevalent in the integrated classroom are paired with the need for early educators to learn new skills in order to maintain their professional status and functional capabilities. Increasing technical demands pressure early educators core professional responsibilities, even as there is a depletion of the time and energy resources required to make these transitions. In addition, teachers must also adjust their pedagogical practice by incorporating instructional technology into their lesson plans, and must identify strategies to meet the academic standards they are mandated to fulfill.

The productivity continuum describes a phenomenon of continuing expectations to perform tasks, achieve outcomes, and maintain expertise within a sustained framework of change in relation to the technical resources made available to early educators, and the advantages made possible by technical integration. The characteristics that make up the productivity continuum are represented by a relationship between the open codes that comprise their focused/thematic pertinence and include: (a) the recurrence of new technical responsibilities made possible by previous technical efficiencies- termed as “the efficiency gambit” (b) an impasse between academic standards required of K-2 teachers and their capacity and inclination to execute them (c) a scarcity of time for teachers to make adjustments to these technical transitions (d) a pedagogical dissonance between teacher motivations and (e)an abeyance of technical integration.

Efficiency Gambit

Teachers in this study reported that technology proves to be efficient in many facets of the educator's professional experience. As Mia notes, "It is super-efficient and effective. It makes testing so easy" (Mia, f3a-2). This sentiment is echoed by Quinn, who explains the ability of technology to change the way he works, "Efficiency is crazy. They're [students] recording themselves, counting to one hundred. Whereas before, I had to sit and listen to every kid, now I can do it like, you know, in the car, in the pickup line, at dance or whatever. Amazing. Just amazing!" (Quinn f3a, 1-I). The use of technology for testing, engagement and other time – savings are sanctioned by its ability to transcend time and space. Nadia was at home sick one day, but was able to use Google Drive to share her plans with the substitute and lauds how, "I saved my entire day . . . all without leaving my bed" (Nadia, f3a-1). However, these advantages conceal a consequence of the efficiency enabled by the integration of technology.

> For some reason, I feel like because we have technology and it's supposed to make things easier. They're adding more to us. Since they're able to do this, and this, then we can start doing more testing and we can start doing more assessments- like I started noticing in Kindergarten that I had to do post tests, pre-assessments and post-assessments in a week. In Kindergarten! (Gina, f3a- 3-I)

Gina's complaint is seen in other participant data. Many teachers in the study discuss that technology had made parts of their job much more simple, yet these time savings and student-centered improvements can come with issues as varied as being stuck with technology that doesn't work (Elsa f3a-5-I), too many choices (Opal, f3a, 1-I) and as Xiu explains, "you gotta ask the District - then you gotta figure how to get it on your I-Pad. - and then your I-Pad gets too

full and you have to figure out how to get the apps off your I-Pad- and then their stuck in this big huge user group" (f3a-2).

As the integration of technology continues, the benefits that technology delivers can often mean that the efficiency gained through its use can be tempered or even erased by the additional work that is either inherent to its inclusion, or through subsequent tasks assigned by administrators. This *efficiency gambit* causes teachers to continually evaluate their productivity as a continuum, wondering what each step forward will mean to their ability to produce results. Cate explains the dilemma:

> Because our curriculum continues to be tweaked and reassigned, this involves training. But I keep going back to like . . . learning how to read has not changed! I don't understand why, especially in [District Name] we need to keep being retrained on this?! You know, this is what the standards are. Suddenly, *this* is what your standards are now?! Teaching kids to read hasn't really changed. So I think I can still do that without this new technology. (Cate, f3a -2-I)

Standards Impasse

Early educators in this research supported the integration of technology in the K-2 classroom as concomitant to a significant increase in academic standards, and an acceleration of curriculum occurring in educational environments. These vicissitudes signal a modification in priorities. There is a moving away from the holistic preparation of the student, towards the priority of academic achievement. As Farrah scoffs, "what is shoved down our throats are these academic standards- standardized testing" (f3b, 2-I). The perception among teachers is that standards are being raised due to a competition with other countries that have achieved superior test scores to the United States (Tonya f3b-1-I). Other teachers suggest that the phenomenon

comes from legislation, such as *No Child Left Behind"* (Yara, f3a-2-I). Some early educators find that the standards are exactly what contemporary students need (Gina, f3a-1-I). What *is* common among these participants are their strong opinions on the issue. Quinn also has a strong opinion adding, "people who are making all the rules and the standards, I think are out of touch with true reality . . .I have to do my best to teach those standards" (f3b-1-I). Sopia notes, " . . .We're realizing they are putting all these standards on us. Are they also realizing that we can't even meet these standards unless we make a connection with somebody?" (f3b – 1-I).

The issue of rising academic standards is central to the challenge of the productivity continuum because teachers face it every single day in almost every subject they teach. Ironically, at the K-2 level, most educators teach all of the subjects themselves. The pressure to meet standards that teachers already feel are too high for grade level - and where many of them feel that the "goal post" could be moved without any consultation or warning - brings teachers to feel like their work is provisional and highly unpredictable. The following exchange with Wanda highlights the frustration that teachers face:

> *Researcher:* What would you say has changed in the process of teaching?
>
> *Wanda:* (Interrupting) Expectations on students and teachers have greatly increased. The standards that they want children to learn at a much younger age is actually . . . they're inappropriate from the early childhood point of view.
>
> *Researcher:* Can you give me an example of that?
>
> *Wanda:* "We just did a solar system unit in Kindergarten and so they have to know the word constellations. How to spell constellations! That's one of our vocabulary words? (f3b-7-I)

Teachers express a lack of control that is increasing in their workplace and they talk in terms of their ability to be productive, while being disconnected from the very means through which they might attain this satisfaction. Whether or not academic standards should be raised, teachers can add this phenomena to the efficiency gambit- as yet another example that produces anxiety and uncertainty about their ability to manage the resources through which they are required to teach.

Time Scarcity

It may be redundant to state that teachers face a time scarcity as the integration of technology, academic standards, and curriculum mandates, are all increased. Nonetheless, in any discussion of resources- as Wanda laments, "I think the biggest resource that I am lacking is time" (f3c-1-I). Without exception, all participants highlighted this feature of the contemporary classroom. As a means to explicate this critical understanding of teacher resources, the following examples will be helpful in order to understand the breadth of this issue:

• "I also feel like the hats we wear- the juggling - I feel like we all got a bunch of things in the air, and we're all just really good at maintaining that. But it's a very delicate balance" (Toni, f3a)

• "I would like say, 'Oh, I love my job'. I still do, but I don't feel like I have the time to really embrace it the way you used to" (Gina, f3c- 3-I).

• "Just keep swimming. I don't really know. Like I said, I thought I knew everything that was gonna be demanded of me" (Umi, f3c).

• "I feel like time management wise -You feel everything's increasing. More and more. Demands are definitely increasing. I feel like every year - sometimes it feels like every month . . . demands for the classroom teacher are very hard for an outsider to understand" (Mia f3a).

All resource allocations that comprise the phenomena of the productivity continuum are intrinsically liked to the issue of time. The data collected suggests that time is the fulcrum around which teacher productivity is conditioned. Nadia offers a final thought regarding the misconceptions of teacher productivity:

> Like everyone says - if we just have the time, we could really do this and that's so true. I don't think people understand what our day-to-day job really looks like. If you were to come in, you would see that from the second those kids walk into the class, to the second they leave [it is constant work]. My lunch break is my only break that I have. Otherwise, I'm doing something every single second of that day, whether it's teaching them, whether it's working with just one kid individually, whether it's a small group or it's giving little Johnny a Band-Aid, or taking little Susie's fever. There's always something that you're doing, and it's never the same every day. (Nadia, f3c)

Pedagogical Dissonance

The pedagogical value that the integration of technology holds in the view of K-2 teacher is diverse. Participants widely reported beneficial *characteristics* of technology integration for the classroom environment – but as interviews proceeded, a wide-variety of views on the value of technology as a pedagogical strategy emerged. These views could be said to exist along a continuum rather than as a binary. Juana explained her sense that technology is simply a substitute method with no tangible differences, "I don't think it's really any different than what teachers have always been doing. It's just using technology to do the same thing. I'm still boosting their confidence. I'm still reminding them to use capital letters" (f3d). Pat provides a more cynical view where, "kids just think, 'let me Google that' and – well wait a minute- let's actually problem-solve here" (f3d). Toni offers a conditional middle ground, in that, "technology

is a wonderful tool for those people that need extra help, but not as a baby-sitter- it's just a tool" (tr-1).

Several teachers that are promoting the use of technology also harbor concerns over its summative use, "There's got to be a balance . . .I'm seeing these kids with computers all the time and they're stressed out" (Gina, f3d). Teachers want the benefits of technology, but see merits in critique over screen-time. The dilemma presents itself in this manner: Yes, kids have too much screen time, but no one wants to give up "their" screen-time - but the other guy? As the interviews with participants matured, the likelihood of these differences becoming known also increased. This feature of the data is included in the relationship (open code) of *the productivity continuum* theme, because it is yet another indicator that highlights a perceived impermanence of control over the resources and the changing roles confronted by K-2 teachers. Revisiting Gina, initially concerned over screen-time and student anxiety, when asked later in her initial interview about the future of technology integration, her response is exemplary of the dissonance between, and among, individual participants:

> David, I wish we had more. I wish I had some more I-Pads. I would still focus on that balance. But my kids, I think I could do so much more academically and getting some things accomplished. Because the kids want it, they want it, but we also have to set those boundaries. (Gina, f3d)

Integration Abeyance

Teachers are being tasked to integrate technology into the curriculum, as a means for student testing, and in their communication practices. In all of these purposes, teachers note that an abeyance of integration can occur for a variety of reasons that pertain to the management of resources. Reliability is a significant barrier to the integration of technology. Though no

questions in this study prompted participants to discuss reliability issues- more than 100 "reliability and obsolescence" topical codes were recorded. The data collected noted numerous issues with aging equipment, a lack of software updates and connectivity problems. A prime example of a connectivity problem is highlighted by Bonnie who notes, "The Internet wasn't working well today so I had to change my reading lesson around . . .I'm hoping that it will work tomorrow. Technology is wonderful when it works correctly" (Bonnie, f3e). By default, teachers are determining if content is inappropriate, or not suited to grade level. In one case, "teachers kept noticing there's been some pilot games on [the I-Pad]. So we had to do a District-wide survey to see if we still wanted to block it - or if we wanted to just keep it . ." (Inez, f3e).

The integration of technology is a complex process in a learning environment full of 5-year olds, as Amara explains, "Well, this class I had last year, one of the boys was kind of being destructive with [the I-Pads] and kind of messed it up for everyone. And that happens because, I mean, they're right out here in this pod, and he's messing with this and bouncing it off the walls, and then nobody else can use it now" (Amara, f3e). A final time-consuming and momentum-killing situation is provided by Mischa, who explains, "It's harder. Because technology is not always user-friendly, it can be very confusing as well, and it's frustrating. And when it's frustrating, uh, forget it- lets just do this the old way" (Mischa, f3e).

As teachers struggle to integrate technology in schools, the interruption from a variety of resource challenges can exacerbate the frustration of early educators, whose job it is to deliver technology in the classroom in engaging and meaningful ways.

The Productivity Continuum and Management of Resources

The management of resources has an influence on the productivity of each teacher held responsible for the delivery of technology integration in the classroom and the implementation of software across multiple platforms. Due to the transition of technological integration, teacher productivity travels on a continuum that is perceived by teachers to be outside their control. Teachers struggle to manage the transition that is manifest in the instability of standards, unreliable resources and a lack of cohesion among cohort attitudes toward technology. As a result, teachers have now been placed in the position of accounting for the discrepancies in the support they required to manage resources and successfully do their jobs. In order to adapt to the integration of technology, teachers take the posture of proactive orientation to counter the productivity continuum and recursively manage their resources.

Theme 2 Proactive Orientation

As teachers navigate transitions produced by the integration of technology, they seek strategies they can control in order to scaffold their ability to manage the resources required to maintain professional standards. Teachers have a history of being "islands" of autonomy, but are now becoming reliant on cohorts and networks to make sense of technical conversions. This proactive stance towards resources is born out of a necessity to react to the structure, or lack thereof, being made available to them. By taking initiative, early educators are acting as agents in the recursive action of adaptation, and are reflexively identifying the means to navigate their life-worlds through a diversification of their practices.

The additive responsibilities that result from the integration of technology have correspondingly augmented the number of messages and messengers required for teachers to

achieve their desired learning outcomes. Teachers are looking past their singular role of teacher in the classroom, by seeking out the advantages of synergistic networks in order to construct the scaffold of their own success.

Cumulative Resourcing

Teachers are diversifying their resources as a countermeasure to the summation of responsibilities, required new skills, and instability of support that the integration of technology has commanded. Early educators are compensating through the identification and diversification of additional resources. Teachers discover these assets through internal and external sources, and search for cohorts that share teaching interests. Teachers look to themselves as a "new" source of technology and several have become their own grant writers. These grants can pay for needed technology, training, or other support that teachers need to bridge the productivity/resource gap. Grants can originate from Public School foundations (Umi, f4a-1) but are often found in private or public foundations. Lucia explains that, "we got a grant from K-20 and that came with training. So we're trained on a ton of different applications and programs" (Lucia, f4a-1). Teachers also secure resources through online sites such as Oprah Winfrey's *Donors Choose* website, "I write grants to this place called Donors Choose.org. That's where I get a lot of my technology, my I-Pad's. I've done I-Pads, and Android tablets. We do what's called Osmo and it's interactive" (Mischa, f4a-1).

Teachers often need to find supplements and alternatives to their current technologies. Educators start this process by identifying stakeholders that share common interests. The closest of these relationships are the parents of the students themselves. Parents can provide affluence and opportunity to fund the required resources to enrich the teacher's classroom, "A parent in our class bought us a little mouse, a little coding mouse, it's a little robot. You can program it to do

what we've been doing" (Yara, f4a-1). Parent groups such as PTO's and PTA's offer yet another source of the accumulating resources where, "The PTO is so supportive and wants to be on board with all the technology [integration]. The district is telling us, 'another year, another two years' and the PTO is like, 'Oh, no, no, no, no. We will buy it for you'. So we're at an advantage" (Zoey, f4a-1).

When all else fails, teachers turn to each other to serve their students and self-fund their resource needs, "I used [my own] money towards two tablets . . .I got the Black Friday sale because -gotta get the deals! We use them in the classroom and when went to I-Pads, I was able to find a different home for them" (Tonya, f4a-1). In addition to self-funding, teachers will create fundraising events that can provide support for reliable technology (Cate, f4a-1) and "look to teacher organized websites such as teacherspayteacers.com to find ways to get the job done" (Denya f4a-1.)

The response to a lack of reliable and applicable technology in schools is humbling, and it provides an appropriate view of how teachers are taking a proactive orientation to the difficulties of technology integration. By responding to the limited resources that administrators find themselves struggling with in each budget cycle, teachers bridge that gap and find ways to buttress the capability to remain relevant in the classroom. However, funding resources are not the only form of self-scaffolding and proactive orientation that teachers are undertaking.

Cohort Collaboration

Teaching is a traditionally autonomous activity. Left alone in a room full of students, the teacher must engage or get the hook like the comedian, perform or fail like the actor, and prepare and train like the athlete – all in an effort to stand alone and provide a rich learning experience. This image of the teacher is changing due to the integration of technology. A second form of

compensation that teachers make to attenuate the productivity continuum, is building cohort relationships in order to gain support and knowledge during the integration process. These collaborations are of particular importance to the sharing of knowledge and technical expertise and can make the difference between a successful lesson or getting the euphemistic hook.

Teacher collaboration should not be confused with a lack of support from administrators. Schools and districts are doing their best by scrambling to make technical transitions under reduced budgets and dwindling tax bases. The need for teacher collaboration is an ongoing demand but has been catalyzed through the integration of technology. The simplest way that teachers collaborate is through dyadic partnering. Mischa describes a common occurrence:

> There's another teacher here that loves technology and we teach together at summer school and we bounce ideas off each other, you know, and I'm like, 'What about this', and she's like, 'Okay, that's a good idea. We could add this twist to it - you know?' So, a lot of times, the collaboration with coworkers becomes like our database. (Mischa, f4a-1)

Some schools can afford to train their librarian, or they assign a technical liaison that teachers can approach. Other schools informally anoint an individual teacher as their tech guru. "So we have some teachers . . . that are experts at our school on SeeSaw. So they held some classes and things like that to train us if we hadn't used it before. So we *can* do peer-to-peer training" (Amara, f4b-1).

Collaborations take many forms and can serve the whole district:

> I got together with some other second grade teachers and I said, 'Hey, I want you to look at this. Would you all be interested in helping me create a lesson for every single unit?' - which was twelve units for her second grade – 'Would you be interested in helping us

> create lessons that we can then share throughout the District, so that all the teachers can teach without the book in their hands?'. (Juana, f4b-1)

This form of collaboration provided a classroom management strategy for one teacher that was amplified and then shared to serve many other teachers.

Teachers have taken a proactive orientation to collaboration by incorporating working together as a value in their teaching process. Kim explains that, "the kids need to see *us* collaborating, and *we* need to collaborate. Just because I think of it one-way, someone else is not going to have the same idea. Your brain is not going to think the same way as mine. So together, we might be able to make it even better" (Kim, f4a-2). Teachers are changing their culture in response to the integration of technology and using intentional actions- agency - to improve their capacities as educators. The final example of this shift is represented by the abandonment of the "sage" mentality of teaching. Teachers are even willing to have 5-year olds teach them about technology, if it means advancing their learning objectives:

> Especially when they introduced this, a lot of our teachers were like, 'I know nothing about this. Nothing. I know nothing'. And it was intimidating because a lot of the kids could pick things up and figure it out right away. And so it took a lot of [incrementalization]. Pick one thing -say one program. Find two ways to use it for just this semester. Taking it very slow, very small steps – helping- explaining. For Master Connect, I've made tutorial videos for our staff. We did lots of peer-to-peer training and then it took being willing [to try]. The teachers have to be willing to let the kids teach *them*. We learn from kids all the time. But, it's not as evident as when we say, 'Hey', show me how to do it. (Lucia, f4a-2)

Staying in Bounds

Information communications technologies (ICT's) have transformed the connectivity and communicative nature of our culture. Over the past 30 years, our ability to reach out to one another has changed from an intentional act, to being a reflexive response to nearly any stimuli. This is also true in the educational environment, where, "those boundaries are so strange right now. I think technology's played a role in that. You end up only being able to communicate - or maybe your preference to communicate - is just text or Snapchat- or quick things like that" (Cate, f4c-2). Truncated modern communication, such as texting with the Smartphone, can be amplified though sheer volume. Teachers have between 40 and 50 parents at any given time that might want to use these devices to communicate with them. Many teachers have experienced issues with parent communication because, "in order to pacify parents - each of them - they're just all-consuming. They're very good to me, they are, they are wonderful parents, but they are very much all-consuming. I'm just a public servant to the nth degree, if you will" (Zoey, tr26).

The quandary of using ICT's is that teachers can benefit from these tools, "like I tell them- call! I want to know. I have a lot of ways that my parents and I communicate with each other. I love that" (Amara, f4c-2). Nadia seconds this sentiment, "It's such a great tool . . . we can instantly reach people . . . but it's always there and I can't ignore it" (Nadia. F4c-1). Even when teachers provide soft boundaries, the issue persists; "I have kind of given some boundaries, but, there's still an expectation of, 'hey, you're available. I know you can see this' " (Farrah, f4c-2).

As a result of the quandary of communication with educational stakeholders, teachers are starting to take a proactive orientation towards communication patterns by setting boundaries and communicating expectations. Kim has communicated that texting is her preferred form of

communication, “I’m the generation where - don’t call me on the phone. The only people I want to call on the phone are my mother and my husband . . . just text me - just text me” (Kim, f4c-2). Other teachers provide conditionality to their contact with parents and can take a liberal stance toward the issue. “So if I’m getting phone calls at night, it’s not a big deal. Or if I’m getting a text at night, it’s not a big deal. And like I tell them- call - I want to know. I have a lot of ways that my parents and I communicate with each other. I love that” (Amara, f4c-2). There are patterns of action that teachers are taking to formalize boundaries and expectations, such as, “on my parent night I’m pretty blunt and open with my parents. I’ve told them ‘I send home messages. I send home pictures. But please understand that my first priority is to educate your child, not to send you pictures of me doing it’ ” (Zoey, f4c-1).

As teachers set boundaries, they are taking the proactive step to improve and define the communication between educational stakeholders. Zoey continues her commentary by pointing out that a systemic solution is required and ultimately, that teachers and administrators will need to come together and identify a policy that affords rich communication and protects the teacher’s resource management:

> So if [administration] could talk to parents through a handout that we give out on parents- along with all the other stack of papers and policies? We can call it a technology etiquette or something. We need to set up boundaries so the teacher is not constantly the punching bag. (Zoey, f4c-1)

Seeing the Big Picture

Data from this study purports that the integration of technology has been evidenced by a productivity continuum that does not yet offer teachers a stability of resources that maximizes their productivity. A final means of compensation toward proactive orientation is for teachers to

seek out information and contextual understandings of the phenomena of technology integration in schools, districts, homes and the culture writ large. Teachers have become intentional about building their expertise. Early educators like Heidi and Umi are seeking out how other districts are implementing technology, "it helped me discover some apps and resources that really changed the learning experience" (Heidi, Tr8), and "using research skills and instructional technology that can be implemented at the K and pre-K levels" (Umi, f4d-1).

Proactive orientation to the big picture means that teachers are intentional about going to and learning from conferences. These conferences can be independent, self-funded opportunities, or school/District sponsored events where teachers can learn; "SouthWest EDU! - I have *got* to get there. I can write a grant for it and I got to go twice in the past" (Inez, f4a-1). Teachers are also using scholarship to understand how they can improve their work through greater understanding of technology. "So my colleague and I discussed creating a survey for our former students. We specifically wanted to find out what the students remembered about their Guided Inquiry units, in which we used Maker Space and all kinds of technology" (Toni, f4a-1). Finally, early educators are relying on theory to inform their knowledge of the issue of technology integration. Lucia explains how the SAMR model (Substitution-Addition- Modification-Redefinition) is offering her a way to improve her professional practices in order to, "work up the model and get all the way up to the Redefinition, where it completely changes the activity and engages students in the higher-level thinking" (Lucia. F4c-1).

Teachers are taking a proactive stance toward the issue of resource management by engaging with the bigger picture of technology integration in their schools, classrooms and culture. By being proactive, they are able to reduce the uncertainty and anomie that can accompany sustained change.

Resources Management and Recursive Identity/Agency Adaptation

The examination of Theme #1 *The Productivity Continuum* and Theme #2 *Proactive Orientation*, uncovers the manner in which early educators are addressing Resource Management as an integral aspect of their professions. K-2 teachers are acting in an iterative pattern of adaptation. By using their agency, teachers are "re-forming" and creating the structures available to them that in turn can address their professional needs and advance their productivity and professional practices. The recursive nature of their acting and reacting, and the formation of new avenues of support to scaffold their work is theoretically significant to the understanding of how the integration of technology is effecting the teachers process. This leg of the RI/AA grounded theory posits that K-2 teachers recursively exercise their agency to produce structural apparatus that in turn facilitate their adaptation to technological integration through the management of resources.

Identity Maintenance

The examination of resource management explicated the significance of technology integration on teacher's professional capacities. The integration of technology has brought with it an awareness that teachers are encountering an ongoing process of institutional/cultural change. Early educators perceive this extant process of change as an antecedent to a continual progression of processes and review of practices. Ross explains, "I believe that we're not even halfway there - because during this interview, you and I - we're not FaceTiming the whole time, we are actually here in person" (Ross, f6c-2). As Quinn notes, "I don't know that we that we will ever get out of the transitional period" (Quinn, f6c-2). The integration of technology precipitates

the need for teachers to redefine their professional capacities, reevaluate the significance of their knowledge, and assess their relative ability to accord to change. In short, the identity of the early educator is being reoriented in accordance with an ascendant technical regime.

Participant teachers in this study discussed the pressure to align their roles to the integration of technology that arise from and the shift in instructional strategies and implementation expectations. The redefinition of their capacities and skills was evident in their discussion of identity. Contemporary teachers describe themselves as "facilitators" and "guides" when they are prompted to explain their role as a teacher (Kim, tr11; Xiu Tr24; Mia, Tr28). The integration of technology can further dilute the identity of teachers, as software and games take over more of the process of guiding students through learning goals and facilitate student feedback. The educator is left with doing the work of redefining their role and identity, or they risk the threat of diminution. K-2 teachers are faced with embracing the identity of the technology implementer or the more difficult task of forging a hybrid of old and new.

Issues of self and identity are not limited by the change the integration of technology into the process of teaching. Early educators perceive a distinct change in the students that are coming to their classroom. Finally, the power dynamics and hierarchy of teacher cohorts has been turned over by the ascendency of technical skills as the primary gauge of the value of an educator in the K-12 learning environment. In order to confront these vicissitudes, the K-2 teacher performs identity maintenance as a response to the integration of technology.

Identity maintenance makes up the second pair of themes that support *Recursive Identity/Agency Adaptation*. Two themes encompass identity maintenance, these include: *Self Appraisal* & *Cultural Discernment*. Identity maintenance describes a process where teachers: (a) encounter the vertiginous changes that are experienced though the integration of technology (b)

appraise the self and discern their culture then (c) recursively redefine their identities in order to adapt (Figure).

Theme 3 Self-Appraisal

K-2 teachers have come to understand the impact of the integration of technology and each individual must appraise their own capabilities and proclivities that lie in concert with, or discordant to, the priorities of technical implementation. Teachers address their own capacities with technology, and their understanding of how to access it and operate it. In addition, early educators must also evaluate their own knowledge to incorporate technology into classroom practices and determine if these skills are less than adequate. If so, then they must compensate for these shortcomings or face stigma and even irrelevancy. The theme of Self –Appraisal has four distinct supporting characteristics in this study: (a) the socially solitary nature of teaching (b) evaluating the evolving student (c) generational & value tensions and (d) perceptions of the teacher role and relevance.

Teacher Island – The solitary nature of teaching

This study found that teachers see themselves as solitary in the social structure. This characteristic is relevant to their role, in the school they work, and in the culture writ large. The lack of permanence of their relationships, high turnover, and mixed perceptions about teachers has had an effect on how educators perceive themselves. The integration of technology only magnifies what, for some educators, is already a challenging vocation. Farrah shares her feelings about the difficulties that teachers can face:

> It's frustrating, I've taught for fourteen years, and I've seen education change in my teaching career, very much so. I've had to learn and adapt. There's this whole other

> aspect of teaching outside of technology, but something that might play into it, is teachers are having a hard time with self-care right now. There are too many kids in our classrooms - there's too many expectations. There's too many frustrations and not a lot of support. (Farrah, F5a-1)

Farrah's explanation of teacher dynamics can be exacerbated by a lack of knowledge that members of the public, and some parents, harbor regarding the work lives of educators. As Nadia exclaims, teachers often feel misunderstood, "I don't think people understand what our day-to-day job really is" (Nadia, f5a-2).

The issues that teachers face extend beyond a disconnection from what "is" happening and what is "perceived" to be happening. Teachers report that many people actually mistrust them and their professional rigor, "From my perspective, its - there's just a mistrust of what we do here in school" (Cate, f5a-2). Cate explains that these attitudes can drive teachers to lose their motivation, especially considering that they are not paid exceedingly well, and have a high-pressure work profile. The resulting work life can be complex, as Opal comments, "I love teaching, but I seriously would not push someone into it. It is just- it can be exhausting. By the end of the day - I put so much energy in and I don't have time to slow down or think" (Opal, f5a-2). The combination of disconnection, mistrust and exhaustion can lead K-2 to feel like they live on an island and that no one can truly understand them.

Teacher island *can* be a rewarding place for certain people, but others struggle with these emotions and perceptions. When this occurs, it can overlap with the demands of the job. As Tonya reports, "Teachers deal with a lot of things on a daily basis, so whenever things are thrown at us, it can be overwhelming and tiring. Whenever we're required to go into these workshops and we're required to do all these things - they are just continuously being thrown at

us ” (Tonya, f5a-2). The magnitude of the responsibilities can have dramatic results, such as Toni letting the researcher know that, “the rate of leaving the profession? - people are just getting so stressed out - they can’t take it and can’t handle all of that stress” (Toni, f5a-1).

The self-appraisals of teachers are not always externally buttressed. A prime example is that certain legislators politicize teacher issues and teachers become aware of this. A teacher notes, “One of the representatives was saying, ‘You all need to stop complaining about your job, and talk about your job in a positive way.’ I don’t feel like we have a platform to really speak, either way” (Farrah f5a,-1). Farrah provides the a final aspect of teacher island, in that teachers can perceive themselves as voiceless in a society that ironically relies on them for so much. As teachers make self-appraisals, it is important to understand that integration did not cause teachers to feel less than appreciated, but technology can also exacerbate teacher dissatisfaction.

Student Evolution

Early educators widely report that students in the technologically integrated school – and in the culture en masse- are changing at a rate faster than the traditional “kids these days” critique. As a result of this perception of students, teachers can feel further disconnect from the very culture that they are tasked to teach!

A common lament is that K-2 teachers simply do not understand the students in the manner that they have grown accustom to. The following report from Juana is emblematic of the change in priority that students represent, and which teachers have difficulty relating, “Most of them when you ask, ‘what they want to do when they grow up?’- a lot of them will say, ‘Im gonna be a You Tuber’ - I just roll my eyes” (Juana, f5a-2). Kim adds that teachers don’t always click with every kid, “people think that elementary school teachers - that I automatically love every kid the second I meet them and interact with them. That is not the case . . . that’s just a

reality" (Kim, f5a-3). Many teachers reported that students have decreased attention spans, calling them, "super short, and I have to use a lot of video brain breaks", while exclaiming that, "when I was a kid, my teacher would not have been singing silly songs in front of them- but it's just like - trying to maintain their attention - it seems stressful to me" (Umi, f5a). The lack of attention in students when being taught is not matched by a student lack of concentration when something is demanded of the teacher. As Zoey explains:

> They are expecting immediate gratification. When I first started teaching we had a computer lab at our school, and it wasn't uncommon for things to go wrong. The kids were very patient, and they wanted to be on that computer and be able to utilize it. So if something went wrong, they would sit there, and they would wait it out. Now, if the I-Pad doesn't work within thirty seconds, these kids are going nuts yelling, "Ms. Zoey, Ms. Zoey, something's wrong. Look at it. What's wrong?" (Zoey, f5a-1)

Early educators in this study report increased cognitive capabilities that are dependent on engagement. The result of this means that teachers must always be entertaining students in order to achieve their learning goals. This has changed the manner in which teachers look at themselves and what their identities must attain in order to "get over". One teacher described herself saying, "of course, I'm always a clown" (Kim tr11). An additional change in students was described as a lack of problem-solving skills when compared to previous generations. As Amara notes, "they have no way to resolve their conflicts because they don't know how to tell somebody what their problem is. And then if somebody tells them what their problem is, they have no idea how to make it better. They have no idea how to ask for forgiveness and apologize. These are all skills that we have as teachers are having to teach the kids" (Amara, f5b-1).

As the contemporary student evolves and changes, the demands placed on teachers to become that teacher that student's desire increases. Teachers know that when they are liked, then there jobs are easier and they are likely to avoid management issues or parental strife. The evolution of the student is yet another factor in the self-appraisal of teachers, who must assess if they can connect to students and build relationships with kids they may not always comprehend.

Generational/Value Tensions

The integration of technology in the contemporary educational institution has highlighted a division of skills that is often generational in nature. As the millennials have taken more and more teacher positions, a simultaneous integration of technology has placed these teachers in a position of skill superiority over the older teachers, who have comparatively less technical skills. In many cases, the older teachers have tenure or seniority and as such are paid more and have higher degrees of job security. The results from this study highlight that a tension between these two groups of teachers exists. The results also showed that this is not a universal phenomenon, nor it is the only motivation for a division on the valence toward, or rate of incorporation of, technology in the classroom. One of the most elderly teachers interviewed had some of the highest degree of technical assimilation in her class, and in another interview, with a first year teacher, the participant exclaimed that, "when you're young - everyone expects you to be able to know how technology works" (Mia, tr28-1). Despite these outliers, the study found that generational tensions exhibited between the participants were significant.

Data collected revealed a distinction between older and younger teacher attitudes toward technology. The central concern of mature teachers was placed on the pedagogical legitimacy of technology integration and its potential overuse in the educational environment. Younger teachers were squarely focused on the "problem" of older teachers, who they perceived as a

barrier to progress and the trajectory of implementation. Amara, an experienced teacher found that, “people are looking at their technology instead of instead of having dialogue with people sitting right there at the table with them. It’s. It's awful” (Amara, tr1). These observations from older teacher also entered the domain of the classroom where, “I think socially and emotionally we have been left behind . . .we are so quick to disengage. I'm on my phone. You're on your tablet, your doing this, and we forget that we have to still engage them socially and emotionally. And so I see that in the classroom that kids really don't - they have lost the art of interacting with each other” (Quinn, tr17). Another perspective of the experienced teacher is that the push for technology is just another in the series of reactions they have seen come and go over decades of teaching:

> My biggest complaint this year and last year is that we're pushing technology and it's super great, but we have to remember that the other skills are super important as well and education goes in spirals or loops. Sometimes they'll be pushing – ‘Oh, we need to push the physical activity’. So one year it's ABL and get them up and moving - make sure you're counting and crossing the midline and the focus is on that. And then it changes and the focus is on technology. (Opal, tr15)

The attention of the younger students was on the relative lack of cooperation of older teachers, who are viewed as reticent and exclusionary. Kim, a champion of technology in the classroom put it this way:

> Attitude! Attitude! Attitude! I think that teachers who have been teaching for twenty, thirty years have been doing the same thing for twenty years. I get it. It's a habit. It's a routine. It's set. It's being set in their ways. They're set in their ways. It's comfortable to teach the same way you've been teaching for twenty years. (Kim tr11)

Val agrees with this perception, adding, “Any teacher over forty doesn't want to use any technology. They hate it all. Yeah, they hate it. They don't want to do it. But there's a lot of new teaching practices that they don't want to do” (Val, f5c-1). Ross suggests that older teachers have a cognitive problem understanding technology, “I have observed that . . . the older teachers may have a harder time comprehending the overall systematic approach towards different technology pieces” (Ross, f5c-1). These results escalate from this point, with accounts that classify the pro-tech teachers as “go-getters” and the older teachers as “dictators” (Kim, f5c-d). Some older teachers found value in what younger teachers had to offer. Devna explains how, “my student teachers would come in with all these cool new technologies, like all this stuff- I’m thinking, ‘man, you’re better than me, right?’ It’s a little bit humbling” (Denya, f5a-1). Quinn suggested that a model of learning from each other might be more productive in that, “I'm the old gal, but I do have a lot to offer you. And in that same tone, I would say - you have so much to offer me because you are excited and you're new and you have so much that I don't even know about. . . .I just think you have to be able to learn from each other's experience, whether you're the newbie or the old gal” (Quinn, tr17). Reciprocal sentiments from younger teachers were not present in the data.

Generational and value tensions make the stuff of self-appraisal and identity maintenance a high-stakes affair for K-2 teachers. Teachers trained before the advent of new/mobile media have difficulty competing with their millennial coworkers. Due to the integration of technology, questions are raised about the value of technology, the value of teachers, and which of these factors will end up being the fulcrum around which the future of educational will revolve. Until such time as this transition, teachers will remain acutely aware that they must align their identity or find other work. To borrow an aphorism from higher education- progress or perish.

Role Perceptions & Relevance

The final aspect of self-appraisal for teachers to examine is their ability to deliver on classroom practices that have been afforded by the integration of new/mobile technology. Despite the generational tensions, and whether or not the pace of technical transition will abate in the future, teachers are adaptable. As Amara explains, "I don't ever want to be old Lady Amara, you know, because I've been teaching a long time. I can retire in three years, but I don't want the kids to ever think that I don't want to be here because I don't know what's current" (Amara- f5d-2). Teachers hold divergent views on technology integration and face unique challenges, but they share the desire to remain relevant.

Early educators are changing. The isolation that teachers face on teacher island and the tensions that arise from intergenerational relationships require them to find common ground in which to collaborate. Tonya explains that, "Our teachers here just they go above and beyond. And so, you know, we learned from each other, and if we see something then we kind of just do it because we want the best experience for our kids" (Tonya, f5d-1). Teachers are adapting to change by finding ways stay inspired, "We have to be lifelong learners. *I* have to be willing to call myself a lifelong learner, and you and I - especially being in education - *we* are lifelong learners and that's our world. We want to teach our kids to be lifelong learners and we have to model that. It is really beneficial when we do, because we learn more if we're willing to open up" (Denya, f5d-1).

Self-Appraisal and Identity Maintenance

The integration of technology in the classroom and throughout the culture in which teachers reside, has placed teachers at the center of a paradigm shift of value and priority. For

teachers to overcome the demands of integration, they must reassess their own value as educators and find the connection that draws them in and makes them desire to adapt. Early educators are transitioning from the conception of "teacher island" and embracing a spirit of collaboration. This places the teacher's identity management in syncopation with the needs of the classroom and the management of resources. Nonetheless, external influences to maintenance of identity still require attention and adaptation.

Theme 4 Cultural Discernment

Results of this study reveal that early educators evaluate their identity through self-appraisal in order to determine how they can coordinate and adjust their sense of self to the new realities of the integration of technology across the educational institution. In order to make these adjustments, participant data showed that the culture teachers encounter influences: (a) the maintenance of teacher identity, (b) the construction of a tech-complementary identity, and (c) the eventual reengagement to the technically integrated learning environment.

Cultural Discernment is expressed by participants in several ways. Teachers report feelings of being alienated from the culture in which they teach. They describe a cultural incongruity with the values and expectations that they experience in their personal and professional life-worlds. This discordance can magnify the divergence of technical knowledge that the integration of technology has already placed upon teacher cohorts. Public school teachers also face mixed public perceptions regarding their value and performance. Participants discussed these occurrences in relation to the external views of educators and education. As teachers begin to conceive of their identity as a teacher of technology, they consider the future of technological progression, its potential duration, the impacts it might have on them, and the conditions under

which they will perform these identities. Finally, teachers provide the framework for what they foresee as a reengagement with this new conception of self, as an educator who is integrating technology.

Cultural Incongruity & Alienation

As teachers grasp the changes that technology integration has manifest in their professional lives, they also confront a culture that they feel has fallen out of sync with their standards. The data produced from this study supports teacher perceptions of culture as incongruous with their ideals and values. The relevance of this characteristic is magnified for teachers, because it is their job in no small part to act as the docents for future individuals that will compromise the culture. Teachers achieve this lofty task by educating, and helping to construct the social capabilities, of each new generation. Thus, the ability of the teacher to comprehend the culture that they serve, and the children they teach, has a pivotal bearing on their identity as teachers.

Like all generational transitions, contemporary teachers are not immune to their own nostalgia. As Mischa explains, "You know, things are different than they were when we were young. I'm in my forties, and we just live in a different times" (Mischa, f6a-2). Despite the cliché that all of us over 40 have faced, the culture is changing at a quicker pace than in previous eras. Teachers have a keen understanding of cultural alterations as a result of observing their students. Juana describes how students have trouble interacting; "Eight years ago, these were things that I had to talk about with kids, but not every day, all day long. The vast majority of kids in my room had no problems with it, because they were still playing outside, and they were still playing with each other and having each other over for play dates and things" (Juana, f6a). Juana's observation points out that the experience of being a child has fundamentally changed in

just a half of a generation. Thus, as the basis of the experience of children is altered, children's behavior changes, and teacher understandings of culture are revised. When teachers have difficulty aligning with these changes, alienation and cultural incongruity arise.

Early educator reports point to the use of technology as integral to a cultural impact on the lives of young people. There is consensus in the data that a correlation between technology use and social development delay is of concern. As Ross points out, "I do see far more social struggles as technology has grown, and I don't know if that's from the classroom or if it's from home or both, or if it's completely different… it could be a societal change or something else" (Ross, gfa-1). The depth of this impression is so impactful in data analysis, that it compromises its own theme in this study. However, when examining how K-2 teachers conceive of the disparities between the extant culture and their ideal culture, characteristics of their "clientele" emerge, "I would say the culture - this generation of children are a little bit entitled – that might be due to technological advances in the things that they expect to get when they're at school has turned into a large behavior problems" (Mia, f6a). Bonnie shares her frustrations about the use of technology among the very young, "Did you really think that your infant needed an app and a baby I-pad case? Babies have been okay for a long time without an I-pad of their own. Somehow they survived" (Bonnie, f6a-1). Bonnie's cynicism highlights the developmental concerns that teachers have with technology, and the identity conflicts that can arise when they are charged to align to the role of teacher in the cotemporary culture, a task inherently rife with technology.

Despite the strong perceived correlations between social development issues and technology, K-2 teachers do not directly fault the technology itself. Instead, they save their ire for parents. Gina unloads:

> It's everywhere. You know, you walk in a store or a salon and it's right there on television. They are just exposed to a lot. I'll watch parents on their phone viewing a shooting and like their third graders sitting right there. I'm like, 'Oh, my God' - it's scary. I'm maybe going off here. Well, remember when we had movies? R-rated - you can only go to movie theater. Now we can watch it at home, and I have kids in second grade, they've watched the movie *IT*. I won't watch that! I'm not going to watch that. And I'm like, 'you watched that movie?' (Gina, f6a-3)

Parents are often mentioned in the data when negative impressions of technology are coupled with children's media use patterns. There is a linkage between the dismay that teachers talk about concerning culture and the parents themselves. Cate provides one such example, "It used to be if you got trouble in school, you are also in trouble at home. The paradigm has now shifted. It's shifted because now if someone's in trouble in school, As a teacher I may find an upset parent saying. 'are you sure that happened?'. There's a lot more parents just automatically believing only their kid's side of the story, which they're usually two sides. It's challenging" (Cate, f6a-1).

Early educators also feel alienated by the culture they live in. Public perceptions can spur these reactions in teachers (see next section), as well as their intermittently contentious relationships with select parents. However, on a fundamental level, the importance of the educator has been devalued by society. A mentioned, the move from the "sage on the stage" to the "guide on the side" may be pedagogically sound, but it also has implications to teacher's status in the culture writ large. As technology continues to chip away at the perceived usefulness of this "guide", teachers are left wondering if their work has sustained value. These trepidations are only confirmed as teachers relative pay is often less than Uber drivers. Meanwhile millages

keep being voted down, leaving the teachers to wonder if their self-worth can be maintained. As Elsa explains, teachers are under stress just to stay in the classroom:

> And we have got our teachers completely overwhelmed with 'I need to do what?' 'I need to do that?' 'I don't even have my own children. What? I have to do that?' I had actually retired and I was called in to take over this class because the teacher that was here, was here for two weeks and walked out. She'd done her student teaching in this building. [She knew someone that worked here but left anyway {de-identified}] She had a excellent education – a bachelors from a private university. And she walked out! She went to fold T- shirts at old Navy. (Elsa, f6a-1)

As teachers work to maintain and abridge their identities, the cultural discernment they must navigate begins with confronting a culture that is also reevaluating its priorities.

Public Perceptions

Teachers face public perceptions that can be polarized. Educators are called heroes and star in national award shows created for the exclusive purpose of teacher edification. There is some public consensus that teachers have an important job, but over the past two decades, some factions have begun to question teachers. Perhaps the most insidious of commentary is that teachers do not work hard. Teachers report that this causes them emotional pain and anxiety, "No matter what the level is, teachers work so hard at wanting students to grow. I wish the world could see that we're not just, 'Oh, you get summers off' kind of people. We are working in our classrooms over the summer. We're prepping and training!" (Pat, f6-b). Xiu adds that, "I feel like a lot of times people have a misconception about teachers. That you just go to work at 8:30am and your leaving at 3:00pm. And that's all you do!" (Xiu, f6b-1). Teachers report that this conception is actually growing, and they worry that this can interrupt their impact; "It's

critically important - that's the way we're going. I think obviously it's getting worse. I just baby-sit all day. That's the attitude of the world" (Kim, f6b).

As teachers assert themselves through labor relations and advocacy, teachers report a corresponding division among members of the public. Kim even has trouble with people in her own sphere of influence and suggests that, "there's always going to be people that don't get it. You know, some of my very own personal best friends think that teachers shouldn't get paid more and that it's kind of more like a hobby and it's not that important" (Kim, f6b-3). Cate provides an astute analysis of where these attitudes have come from and how they have magnified:

> From my perspective, there's just a mistrust of what we do in school, and that teachers really don't work very hard and they are not being held accountable. I mean, this goes back at least more than a decade. So [others would say] 'we need to hold them accountable' and 'we need to start raising these scores' - That's what it goes back to, as well as the laws that have been passed. (Cate, f6b-1)

In order to alleviate these perceptions, some teachers would like to see more exposure of their work-lives to the public. The belief that accurate information will act as a means to build understanding is seen in how Nadia believes the issue should be addressed. "If [people] would just come in and see what we actually deal with, and the situations that were put in - and the kids that were dealt - and the things that we have two do - I think it would open up a lot of eyes in the community just how valuable teachers are" (Nadia f6b-3). Teachers also reported that public perceptions of teachers now may be moving on a positive trajectory, "for a long time teachers got a bad rap, and it was always the teacher's fault for everything that happened. I think that its starting to shift and parents are seeing . . . – the more that they are able to step into a classroom -

how hard teachers work for their kid and that the teacher has built that relationship with their kids and that they want each child to succeed" (Pat, f6b-1).

The integration of technology has added another dimension to the public perceptions of K-2 teachers. Concern over screen-time is prevalent and teachers must defend their use of technology, such as Xiu, who pleads, "It's not technology just for the sake of technology" (Xiu, f6b-2). This public dynamic places yet another point of pressure on the self-concept of teachers and how they are supposed to define themselves; Are they a defender of instructional technology? Do they avoid this characteristic? Technology is central to how they must redefine their capabilities and how they will compete for employment. Yet, there is mixed public support for this action. As teachers evaluate how they will reinvent themselves, they confront this paradox. Farrah sums up this issue by noting, "So I don't know, You know, it's a good question, and I have yet to figure that out, and only people who love a teacher really know what's going on" (Farrah, f6b-1).

Perceptions of the Trajectory of Technology

The integration of technology in schools has changed the fundamental nature of teaching for the K-2 teacher. As early educators undertake the iterative task of coming to terms with this new role, they are probing the limits of the current technical transition and attempting to identify when, and if, it will end and what changes could occur along the way. This study complied reports from K-2 teachers about there perceptions of the future trajectory of technology in schools and education more widely.

Early educators have a view technology integration in schools that is linked with the ascendency of technology in the culture. There is a sense that technology is a driving force behind the culture and its collective actions. As Kim highlights, "Yeah, especially now - I feel

like with the way technology's going, it's inevitable" (Kim, f6c-1). Quinn suggests that the move toward technoligization is not temporary because, "Technology is not going anywhere. I think we're only going forward" (Quinn, f6c-1). The study results suggest that teachers are preparing for this change to be long-term. Some teachers foresee a leveling off at some point, such as Mia who adds, "I think that in the next seven years, there will be all sorts of different gadgets that kids can use . . . So I think those types of advances will happen - I think they will try to make technology more convenient and user-friendly" (Mia, f6c-1). There is a pervasive sense that technology is not being used for tech sake. Even among those generational outliers that want to temper its incorporation into the classroom, there is a sense that schools are being purposive in the choice to integrate technology in the school system. Pat explains that, "technology is not going away. I think it's absolutely going to be integrated . . .the way [schools] are integrating it is preparing [students] more for the future" (Pat f6a-2). Finally, teacher perceptions of the trajectory of technology integration extend beyond a "transition". Mia concludes that, "I think there will always be technological advances . . .and I do think that we will be in a transitional technological period for years to come" (Mia, f6a-1).

The advancement of technology into mainstream culture has transformed the way we live, just as technology integration in schools has had a significant influence on the K-2 teaching process. Educators in this study look to a future where instructional technology will be a sustained feature of their work lives and identities. This step toward realization provides teachers a launching point for the revision of identity that their vocations, and their constituency of students demand from them. Educators do not claim to understand what kind of technology will be offered. As Juana clarifies, "I don't know what technology will even look like ten years down the road. But honestly, every single year, I'm learning something new" (Juana, f6c-2). However,

the sense of an initial progress blossoming into a sustained impact for a significant period of time, provides a fair assessment of K-2 teachers understanding of the future. As Wanda sums up, "we've made huge leaps and advances, but I still think there's potential for serious growth" (Wanda, f6a).

Reengagement

Adapting to change is a difficult process. Results from this study indicate that teachers who are intentional about reinventing themselves find a way to overcome internal doubt and external sniping. Reports in this study include testimony from K-2 teachers who have come to terms with the perceived permanence of the influence of technology in their professional practices and their narratives hold a redemptive quality. Umi found her north star when using technology, describing how she has reoriented her posture, "it has been making me cognizant of how I am using the other technology at my disposal. I want to make sure technology is purposeful, and not just taking up time in an already crammed schedule" (Umi. F6d-1). Juana explains how her attitude guides her integration practices:

> I think that's why in my classroom I try to have a healthy balance - technology is such a great resource, and I tell the kids all the time, 'Use your resources. If you have something that can help you?' For goodness sake, use it! So there's this healthy balance between the use of technology and no technology at the same time. (Juana, f6d-2)

Providing a media ecological perspective to the pedagogy of technology in her classroom helps Xiu to define her approach to using technology, "my job is to help them know how to use technology tools and which tools they can use appropriately- defining what are safe ways to exercise excellent digital citizenship . . . just helping them to learn about the world" (Xiu, f6d-1).

Finally, Quinn provides an account of teaching her students life lessons as she comes to terms with technology:

> Although there were moments of frustrations today using technology in the classroom, I was able to demonstrate grit, perseverance, flexibility and controlling my emotions in a stressful situation. It's in those moments that I have learned to maximize the opportunity to teach coping skills that will be used daily for a lifetime. Never pass up a teachable moment… even if it's at the expense of my ongoing 'love/hate' relationship with technology. (Quinn, f6d-1)

Identity Maintenance and Recursive Identity/Agency Adaptation

Early educators require identity maintenance as a result of the redefinition of their professional practices and the fundamental shifts in their self-perceptions as educators. The data from this study has shown that technology integration has had profound effects on the work that teachers are now expected to do, the skills they are required to master, and on the work relationships that buttress their potential success. The grounded theory of RI/AA posits that participants in this study are making self-appraisals and discerning culture in order to create, foster and recursively maintain identities that are congruent with the repercussions of the integration of technology.

As early educators come to understand the ramifications of technology integration on their self-appraisal, and as they come to terms with them through cultural discernment, K-2 teachers recursively form and reform the image of the contemporary teacher through identity maintenance. Meanwhile, teacher perceptions of its trajectory indicate that teachers assume they will be revising their practices and self-perceptions long into the foreseeable future. As a result,

teachers provide the basis of the recursive practice of identity maintenance. By seeking out additional information and finding new ways to connect to their vocations, teachers are pairing their resource management and their identity maintenance:

> I was one of those teachers that was totally against technology. I hated the idea of tech being in my classroom. Screens - they're going to ruin my children. Screens are going to make them all have ADD. It's going to be horrible. Then I took a class with Dr. [Name] from the Education Department at [University]. She teaches a lot of classes about 21rst century teaching practices and applications. And when I saw how you could take technology into the classroom and actually make it functional and actually make it meaningful? I got really excited about it. (Lucia, tr-12)

Discordant Educational Outcomes [RQ#1 Finding]

Research question #1 asks, "*How does the teacher evaluate the increased availability and use of new/mobile technology and media tools in the process of achieving desired learning objectives?* In order to address this question the definition of "new/mobile" technology and media tools" and "desired learning objectives" are addressed. As noted, this study set parameters of new/mobile technology and media to entail (a) tablets and smartphone type hardware and (b) apps and programs that advance communication and student data screening and analysis. These delineations were chosen based on the responses of participants and the review of literature herein.

The definition of "desired learning objectives" was also garnered from the data collection. Teachers describe the learning objectives of the K-2 teacher as pertaining to both academic and social advancement. As has been the traditional view of early educators, K-2

teachers identify themselves as preparing the student for the academic environment to come, as well as the social demands of subsequent grades and interactions outside of the academic realm. When asked how they would describe what they do to a stranger, teachers reported the expected academic goals, but also used terminology such as; “life skills” (Tonya, tr20), “we’re not just academic, we’re teaching the whole person” (Opal, tr15), “Working on, communication skills, how to resolve conflict” (Heidi, tr8), “how to be a good person” (Nadia, tr14), and “not only educating academics, but also helping children become a whole person” (Farrah, tr6). Yara suggests, “it's no longer just academically. There's a lot more things going into it” (Yara, tr25). Opal provides a summative view:

> My role is to get my kiddos on the hole to just help them grow. We’re not just academic, but we’re [teaching] the whole person. We work on social skills, we work on adaptive skills we work on relationship relationships - teaching them how to build relationships, how to calm down, and looking at that whole person, how to navigate in a world of technology, how to navigate in a big world. (Opal, mq-1)

Finally, Ross notes, “there are three focus areas that I really place my efforts on. And that would be the academic, the social, and then the emotional” (Ross, tr18). The focus on both academic and social goals would come to have significant bearing on the findings. It should also be noted that in the clarifying questions that occurred in the third leg of data collection, it was confirmed that in each district that data was collected, there are specific academic standards for the social development of the students for each grade, as well as portions of each students report card where these advancements can be communicated with parents.

The evaluation of teachers of the integration of technology in the contemporary K-2 classroom (RQ#1) produced a discordant set of impressions as evidenced by: (a) participant responses (b) the data analysis and (c) the themes produced. The data collected from participants in order to produce the reported results was both prolific and ardently held, magnifying the differences in results. The themes produced by the study include: (a) a set of decidedly positive perceptions regarding the influence of technology integration on the academic production of students, and the efficiencies of teachers and (b) a consistent reproach on the development of student social skills and the relationship of technology use and integration to these detrimental perceptions (Figure 3). This discordance was unexpected and it should be noted that no specific questions regarding social skills were asked, and the data collected regarding the delay of social development was garnered though looping responses to questions. Data collected on the use of technology for academic goals were viewed by teachers as advancing student success, and transformative to the process of managing assessments and differentiation.

Teachers have great pride in the delivery of technology perceived to increase student performance. The successful delivery of technology in the classroom is dependent on the ability of teachers to construct meaningful learning opportunities through the integration of technology. The early educator must identify a pedagogic means to incorporate learning objectives and instructional techniques. The first research question asked how teachers evaluated the increase of new/mobile technology and media. In their accounts of the use of technology and media tools to advance academic learning objectives, teacher perceptions were overwhelmingly and adamantly beneficial in their description.

Figure 3.

Discordant Educational Outcomes

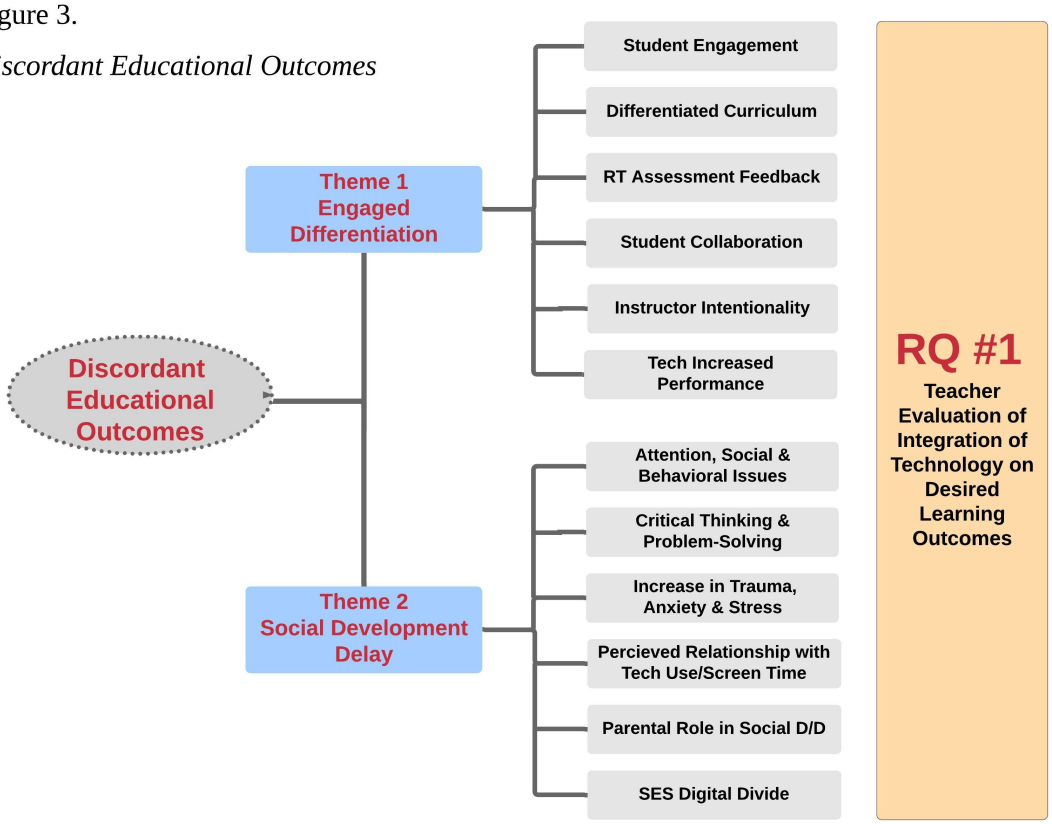
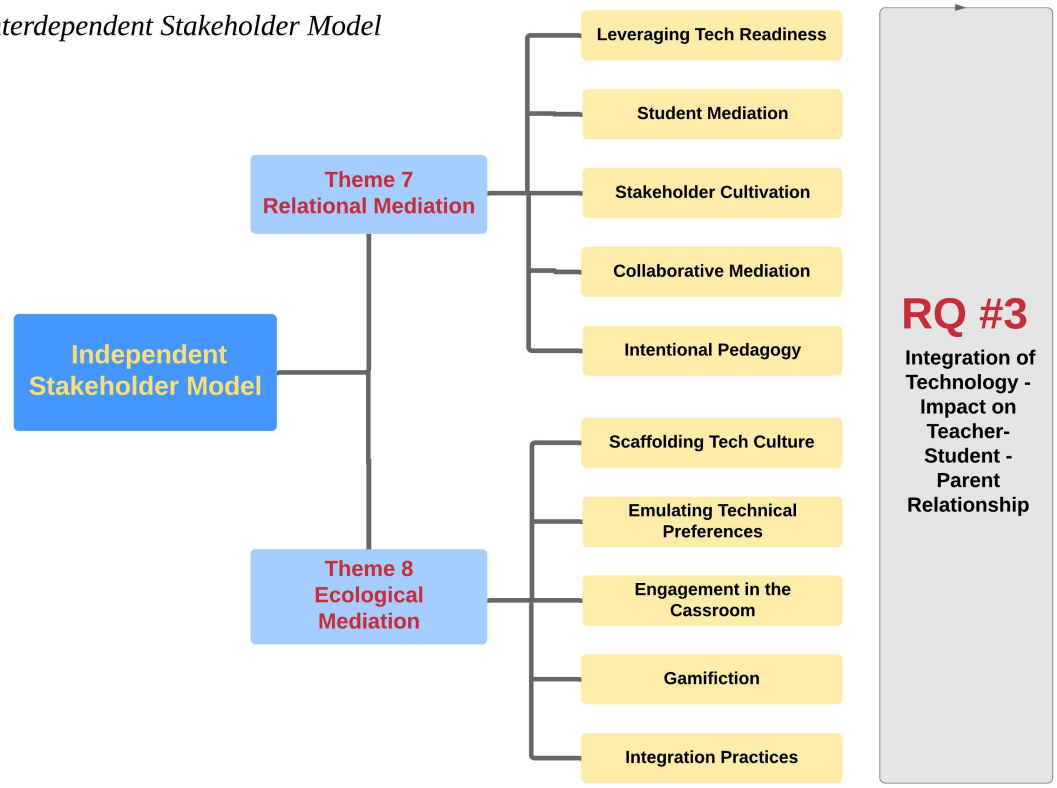


Figure 4.

Interdependent Stakeholder Model



Unexpectedly, participants attributed the perceived delay or decay of social skills in the K-2 student, in part, to the ascendency of technology integration in the culture writ large. An even more surprising result was that early educators did not separate negative effects from the use of technology in the classroom. Additionally, the discordance of these two seemingly opposed positions is not explicitly acknowledged by the participants. Instead, teachers reported the numerous and transformative results of technology integration independent of the accounts of social development delay.

Participants discussed the declining social skills and behaviors of students that enter their classroom. These impressions were shared across all the grades of teachers that were interviewed for this study. Thus, social development issues reported by participants are not correcting early in the educational process. Furthermore, and perhaps most significantly, teachers in this study communicated, implicitly and/or explicitly, the penetration of technology in the culture as a potential source of declining social skills and either, did not exclude classroom exposure to technology when discussing these effects, or explicitly included them. The relationship of technology and social skills that were reported ranged from the tangential to the causative, but the presence of the concern was universal among participants. Thus, teacher evaluation of the integration of technology in the classroom represents a consistent phenomenon of discordance. This outcome is addressed in the grounded theory of Recursive Identity/Agency Adaptation as a feedback loop.

The grounded theory of *Recursive Identity/Agency Adaptation* posits that *Discordant Educational Outcomes* represent a feedback loop between the "being" of *Resource Management* and *Identity Maintenance* and the "doing" of teacher implementation of technology in the classroom. When teachers maintain their identities, they control *who* they are – when they

manage their resources, they control *how* they work. However, when they actually implement curriculum and standards in the classroom, they are not granted control. Instead, they implement curriculum developed by others, and uphold standards that are established remotely. This lack of control is coupled with the strong sense of responsibility on the part of teachers to achieve what has been reported as the development of the skills of the whole person and the social and emotions aspects of development.

RI/AA theorizes that discordant academic outcomes can be understood as a feedback loop in recursive adaptation. When teachers implement technology, the beneficial aspects of their outcomes on learning reinforce their proactive orientation (Theme 4). As has been seen, the benefits of technology reinforce and buttress the management of resources that teachers are responsible to execute. The success stories of technology serve to solidify their self-appraisals (Theme 6). Additionally, the negative perceptions that teachers report on the social development delay, and its connection to technology serve to challenge teachers identity (Theme 5) and can complicate the productivity continuum (Theme 3), because many teachers strive to compensate for these social issues on their own. As can be seen in (Figure 2), the red arrows represent the feedback loop of *Discordant Educational Outcomes* and express the relationship between teacher evaluations of the implementation of technology (RQ#1) and the effect of technology integration on the process of teachers and teaching (RQ#2). It is acknowledged that this proposed feedback loop requires additional research and will be addressed in the discussion of this dissertation; this feature of RI/AA is supported by extant theory in identity. The themes of Discordant Educational Outcomes explicated below, provide a fuller understanding of these findings.

Discordant Educational Outcomes are comprised of two themes. *Differentiated Engagement* (Theme 1) describes the beneficial effects of instructional technology as reported by

teachers. These include: (a) the ability of technology to engage K-2 students (b) the affordance of instructional technology to differentiate educational interventions between teachers that excel and those who struggle (c) real time feedback from assessments that allow faster and more focused interventions (d) the facilitation of student collaboration (e) the fostering of instructor intentionality and (f) increased student performance.

Social Development Delay (Theme 2) describes the delay and decay of social development indicators as reported by teachers, and the additional correlation and causation of this delay to the implementation of technology devices and programs, including instructional technologies in classroom settings as reported by teachers. These reports include: (a) attentional, social and behavioral issues (b) critical thinking & problem-solving issues (c) increased reports of trauma, anxiety and stress in K-2 students (d) the reported relationship of social issues to technology use (e) the role of parents in social development delay and (f) the associated issues of the socio-economic/digital divide. Together, these themes will explicate the phenomena that make up the discordance between the reported evaluations of the integration of technology in the K-2 classroom (Figure 3).

Theme 5 Engaged Differentiation

Research Question #1 asked how teachers evaluated the impact of the integration of new/mobile technology on learning objectives in the K-2 classroom. One of the two themes that emerged from this inquiry identified that teacher experiences support that student engagement and differentiation were significantly improved by the integration of new/mobile technology. In addition, the integration of new/mobile technology was found to transform assessment. Finally, (and as will be discussed in RQ#3) the integration of technology was also found to greatly

improve the model of communication for teacher –student - parent interactions. Engaged Differentiation describes these beneficial results.

Student Engagement

The results of this study support that teachers identify student engagement as a significant benefit of the integration of new/mobile technology in the K-2 classroom. In order to understand the characteristics of "engagement" and how it is understood, Gina provides a baseline:

> I believe that because of technology, lessons increased student engagement, provided hands-on opportunities, allowed students to collaborate (partners and groups activities), helped students who are struggling with reading, by using the read aloud, enriched vocabulary, and helped them to acquire knowledge through videos (visual aids). Technology helped me to tap into a variety of styles of learning, and to effectively teach a lesson. It's a win-win for students and teachers. (Gina, f1a-1)

Gina's description offers insight into technology as a catalyst for engagement across a wide variety of applications and motivations. The penetration of technology for students can fairly be described as practically universal. Heidi explains that, "it allowed every kid to be engaged in what we were doing. It wasn't just like – 'Okay, everyone look at the screen', and only one kid at a time gets to do the activity. Instead, it was there for every single person to do, and it allowed me to automatically see" (Heidi, f1a-1).

Teachers, who now see the engagement of technology as a pre-requisite to learning, have not missed the critical importance of the ability of technology to gain and keep the attention of students. As the exchange below demonstrates, teachers have found an integral means of motivating students:

Researcher: What would you lose if you got rid of all the technology?

Kim: Engagement.

Researcher: So engagement leaves this room when technology leaves this room?

Kim: Yes. (Kim, f1a-1)

It should be understood that the benefits of the engagement of technology are not simply additive. "Technology capacity" has become an educational goal for teachers. In fact, early educators are often issued a standard by which technology should by taught, and what benchmarks should be met by the prescribed grade intervals- the National Education Technology Standards, NETS•S (NETS•S). Therefore, the integration of technology is not only a method for teachers, "I think technology has more than one purpose. (A) We have to teach them how to use it. I mean, now it's become its own purpose. They have to be prepared. (B) It helps kids stay more engaged" (Zoey, f1a-1).

The degree to which teachers endorse the use of technology for the engagement of their students cannot be overstated. The descriptions of technology include its ability to enliven dry subject matter, waken sleepy kiddos and focus the unfocused of children. Cate describes how, "even the most wiggliest, most distractible kid- when he's on the device, he's sitting still and he is engaged, which blows my mind. You can see how [tech devices] kind of get over-used because that kid is - oh my Gosh - he's finally on task! That's pretty cool, too" (Cate, f1a-1). The results of this study found that teachers strongly prefer the use of technology when possible. The precedence set by the use of technology is perceived to be irreversible in that, "if a student walked into a classroom where there was no technology. I think they would feel bored. I think they would feel disconnected unless we provided another way to engage them" (Denya, f1a-1).

Differentiated Curriculum

A second significant characteristic of the impact of technology integration on academic achievement reported by K-2 teachers is that the ability to differentiate learning strategies. Differentiation is the ability of educators to provide relevant pedagogical interventions to students that have achieved a variety of expected learning penetrations. The integration of technology improves this task by identifying these capabilities and providing relevant interventions. These programs continuously update and provide real-time reports to the educator and the provision of additional targeted learning opportunities. Lucia describes how, "these programs differentiate my students learning for their personal needs. It finds holes and areas of growth for my students" (Lucia, f1b-1). Differentiation has become more important to the contemporary early educator as entering students have more diverse cognitive and cultural backgrounds.

"I'm a first grade teacher. But now, I can't quite gauge that because the kids that are there [in my class] may be reading at a third or even fourth grade level. I have to show a year's worth of growth with them. So I have to introduce things that I've never taught before" (Cate, f1b). Cate gives the reasoning behind the critical importance of differentiation technology. Early educators are required to have a certain percentage of their students advance a full grade level each year- regardless of their entry level ability. Thus, if a second grade teacher were to have students at a 4^{rth} grade level, that student would be required to test at the 5th level at the end of their class. This mandate has placed a great deal of pressure on educators. Pat highlights the relief of technology assisted differentiation; "When you have twenty-five to thirty kids who are anywhere from two grade levels below all the way to two grades levels or more higher? [The

differentiating screener] is able to hit a learning target for all of those kids and to get them [to the standard]? That is something that has made it invaluable, to be honest" (Pat- f1b-2).

The automated feature of differentiating software s found in its capacity to provide immense time and worry savings for the teacher, "I use Lexia - it's a reading phonics app, and it's differentiated. So it assesses what skills the child has; it reads to them, and they have to match the letters with the sounds or the pictures with the words. So, it meets them where they're at. So, that is easy for me" (Heidi Tr#2). Teachers are able to have these tools provide the proper instruction, but they also can provide an assessment of skills and achievement for the educator. Pat explains how she is able to, "go online to verify what skills they are passing, or having trouble with. This helps connect to the child by meeting their needs" (Pat, f1b-1). Heidi adds, "it's just tailoring to what is developmentally appropriate for the kids that you have, but teaching the same concepts and you're just kind of building that up in each grade level" (Heidi, f1b-1). Engagement and differentiation provide the teacher a motivated student who has their educational needs being met appropriately.

RT Assessment & Feedback

The third benefit identified from the integration of technology is described by Lucia; "Today my students took a pretest on measurement using a program called Master Connect. I received the results instantly! Based on the results, I know that my students have a strong background in measurement. I immediately know what my next lesson in math will be" (Lucia, f1c). Lucia defines the advantages of real-time assessment feedback on advancing the class. By securing real-time results, teachers are able to stay on schedule with pacing guides and gain relevant information that they can use to, "better help the kids see their mistakes because it is so fresh in their minds. I use a base assessment – also done online – to determine grade level. This

sets where they start" (Nadia, f1c). The information provided to the teacher by the screener also offers them the ability to intervene on behalf of students in need. Nadia continues to explain, "Each week, a graph is created and I can see how quickly to intervene or push forward with a student in one area. This helps me to set realistic and database goals for each student" (Nadia, f1c). The educator not only can only help to provide goals for students and teachers but also acts as a major time-saver for educators, as "the screener offers instant results when they are done . . . I will not need to spend hours grading'" (Pat, f1c-2).

The time efficiencies afforded by the use of real-time screeners allow early educators to support student success. This can be achieved by, "taking data from a tally chart and turning it into a graph" and this allows the teacher the benefit to, "offer praise and/or reteach on the spot. I think the quick re-teaching can foster even better relationships with my students, because they can be assured that I'll help them understand new content" (Cate, f1c-1). Amara adds that the printed scores can be used as an incentive, "the kids actually can use it as a brag sheet. Like if they're doing a paper that they scored really well on, they can take a picture of it. They can send it to their parents. They can say. "I did this today and I did such a great job. Look at my work" (Amara, f1c-1). Finally, advanced software programs can determine whether students are using random guessing to achieve their results. "I can pull reports to see if they are just pushing things or are they actually doing it? But it's a tremendous help for my ELL students for sure" (Mia. F1c-1).

In order to fully understand how real-time assessments have transformed the performance of students and teachers, Yara compares standardized testing before and after the integration of new/mobile technology:

> So I would have to individually test on three separate measures for each child. Back then - I would be carrying these booklets home and grading them at night, because I didn't have time during the day to do that. Well, this year we have gotten more technology. They switched us over to a different program and it's all on I-Pad. It scores as the kid takes it. Do you know how much time that has saved? I mean a ton! I'm not having to take anything home, or taking time away from my own children. The child sits in front of me - we take the test - it takes five to seven minutes. Hit submit -It's done! Then I can immediately print out a graph and send it home to the parents. (Yara, f1c-1)

Student Collaboration

The integration of technology in K-2 classrooms fosters collaboration between students. The data collected for this study supports increased partnering, peer-to-peer learning and collaboration due the integration of technology as reported by the participants. Tonya describes how this process can occur; "It is exciting to watch the students teach and explain to their peers how to play a game or how to get to a specific website. Not only does the student learn from their peers, but the expert student is learning by teaching others" (Tonya, f1d-1). The K-2 classroom places a priority on, "forming social bonds through projects and teamwork" and teaching students life-skills of collaboration where, "we work on a lot of teamwork and being team players" (Inez, f1d-1).

Early educators identify strategies in order to support student success. To promote collaboration, teachers use pairing; "the best thing that I have ever found when there's a gap in learning or maybe a student doesn't have a technology at home so they don't know it, is pairing students. Putting a student that knows with a student that doesn't know and they just drain knowledge from each other" (Denya, f1d-1). Mischa notes that, "technology starts drawing them

in, and builds that interest . . .they realize, 'you know what? I'm good at this, and I enjoy it'. And it just opens other kids up who are like, 'What!! How did you do that?' So kids are teaching other kids some of the things they are learning." (Mischa,f1d-1). Teachers find that the integration of technology can help them attain their learning objectives through the collaboration of their students because, "technology builds relationships when students are given tasks/assignments to complete with partners" (Gina, f1d-4). Finally, by using technology for collaboration, the teacher, "becomes a true facilitator using technology vs. paper and pencil" and provides the efficiency to "achieve much more, much faster" (Ross, f1d-1).

Instructor Intentionality

A finding of this study is that teachers are able to deliver the academic benefits of the integration of technology through an intentionality of their teaching practices. Instructor intentionality can be defined as the certainty of knowledge for what is relevant to a given situation and then acting on that knowledge. Pat's approach to collaboration through engagement with technology explains the process. Pat exclaims, "teachers are trying to make students problem solvers -let's go figure it out! That *has* to be teacher intentionality" (Pat, f1e-1). Data shows that teachers who are decidedly motivated by technology share a culture of support in that, "we encourage one another to succeed. Students are not afraid to make mistakes here - and most importantly, they are taught to help one another by using their gifts" (Gina,f1e-1). This sense of inertia extends to the content of the curriculum. Umi shares her thoughts about developing the attitude to learn, "I have come to really value the "explorer" portion of the research, where children get a chance to look at the broader topic and see what is out there" (Umi, f1e-1).

The participants of this study exhibited an attitude of learning "with" their students. Lucia, who describes herself as a lifelong learner, explains that, "This year, I'm going to try to

focus on using the Google classroom more" (Lucia, f1e-1). Early educators are aware of the dichotomy of the Internet for kids and want to teach students the upside of that equation; "I want the kids to see that they can produce things out there on the Internet that are lifting people up and not just be about self" (Juana, f1e-2). The intentionality of teachers in the use of technology and information is premised on the actions of educators to facilitate student's success and to enable the student to find their own answers. Zoey's approach provides an example, "It's not just me handing them knowledge, it's also me teaching them how to find knowledge on their own. If I'm just there talking *at* them, they're not going to get that" (Zoey, f1e-2).

Technology Increased Performance

The ultimate measure of the evaluation of the integration of technology in the classroom for academic advancement can only be premised on student learning objective performance outcomes. One indicator of student success is premised upon the manner in which students are overcoming challenges through the use of technology. Lucia shares a student success story:

> I had one student who really struggles with math. She even attends a first grade math class [in second grade]. When she finished the last test she had received an 89%, or mastery. She was beaming from ear to ear! She was so proud of herself. Instead of waiting a day or more for her to get her results, she got them instantly! That wouldn't have happened without that technology. (Lucia, f1f-1)

Educators are finding that the use of technology can bolster student's confidence. Opal sees the change in her students who she is, "teaching both technology and math skills", and as they are growing in their studies technology is helping them by, "building their confidence and trust that I will support them. They smile so big and high-five, and they see they got it!" (Opal, f1f-1).

Students that struggle also advance their scholarship through engaging with technology that is incorporated into the curriculum. Gina talked about a "shy student" in her class that was able to overcome her fear of public speaking and "shine through technology" because the student could "see herself in action" (Gina, f1f-1). Educators that incorporate technology in their teaching practices find that the capabilities of their students to comprehend more advanced content can be revealed. Quinn found that, "they're creating things . . . I didn't even think they could do! - They started doing some app smashing on their own like, 'Hey Ms. Quinn, um- if I could do PicCollage- I could do this thing and we could put into SeeSaw, .. . I could make that,!" (Quinn, f1f-1). As will be addressed in themes seven and eight, teacher and students are connecting with parents and knocking down the separation between the dyadic triad of relationships that have classically represented the communication of classroom stakeholders. Gina shares that, "I like to be able to have them record [videos] and their parents see what's taking place in the classroom and how they're progressing" (Gina, f1f-2). When one of her "kiddos" is struggling with reading and breaks through Gina responds, "if they can read a poem, I can put it on [the class app] and that student can share that success with their parents. I love that." (Gina, f1f-2).

Theme 6 Social Development Delay

Theme five provided evidence of significant positive teacher perceptions from the integration of technology in schools. Participants reported improved learning capabilities for their K-2 students. Theme six comprises the related social and development delays that have been reported by K-2 teachers. Teachers implicitly and explicitly connect these barriers to student success, to the ascendency of technology, and the use of technology by the K-2 aged

student. These reports are discordant with the teacher -reported "desired goals" for socially developmental leaning. Teachers describe a delay or decay in the development of social skills in their descriptions of students. These descriptions include both in-class behaviors and a critique of both parenting and the influence of technology on the culture writ large. Characterizations include social awkwardness, inattention, poor behavior, inability to concentrate, a lack of critical thinking skills, and poor problem-solving abilities. It is important to make the distinction that teachers are not simply noting expected behaviors of a particular age group. On the contrary, teachers are making comparative distinctions that students are declining in these skills when contrasted with their previous students of the same age in analogous situations. As Zoey notes;

> I think that the attention span of children has shrunk over those ten years [I've taught]. I think a lot of it is kids now - probably in part due to technology – They are expecting immediate gratification. I found myself having to explicitly teach and model the soft skills that were kind of common- they were just second nature when I first started teaching. (Zoey, f1a-1)

This explicit connection to technology is of specific relevance to this study, which seeks to understand the impact of technology integration on the ability of educators to achieve goals for learning and the process through which they achieve these professional goals. Theme six encompasses the concerns that K-2 teachers have about the social development issues of their students and implicit and explicit relationship of technology to these issues.

Attentional, Social & Behavioral Issues

K-2 teachers in this study widely report the decline of social skills among their students. Among the highest areas of concern are the attention spans of students, which teachers talk about in relation to the lessoning of their interaction with other students. Opal clarifies this point:

> They are lacking in the interactive skills. So, if you go to the table at a restaurant and you see the kid sitting there on an I-Pad. Well, they need to learn how to converse . . . It's easier to just give them the I-pad and the technology, and that's fun- and we're in technology world. But I also see the side of it where it really hinders their relationship, building . . .their interactions. (Opal, f1a-1)

The perceived reduction of the ability for students to socially interact at the expected level complicates the delivery of learning objectives. When teachers experience an unexpected reduction in the social capacities of students, the curriculum demands and social development assumptions of early educators no longer coincide with student capabilities. Teacher participants express their dissatisfaction with student development at the cultural and pedagogical level, and are concerned with the changing priorities and capabilities in parents of their students. Juana explains that, "you see some of these parents that come [in here], and they don't talk to their child [toddlers] almost the whole time that they are here - I think that those [same] kids are coming into kindergarten now, because we're seeing the effects" (Juana, f1a-1). Juana goes on to refine her thoughts, "[students] don't know how to socially interact and how to talk things through- so we are seeing more and more behavior problems too. So, when technology is used properly, fabulous! But when abused, it can be detrimental" (Juana, f1a-1).

Younger students have always exhibited their share of behavior problems in the classroom. However, teachers in this study are offering a distinction from what they would have expected to see in their students, and they offer a reason why these variations are occurring. "I would say the culture. This generation of children are a little bit entitled – that might be due to technological advances in the things that they expect to get when they're at school, and this has turned into a large behavior problem" (Mia, f1a-1). Teachers report that the use of ICT's by pre-

school children is having an effect on the capabilities of students entering Kindergarten, and teachers are alarmed. The following exchange between the researcher and Pat marks the unease:

> *Researcher:* So what do you think we have to keep an eye on as we integrate technology and dive in with two feet?
>
> *Pat:* [interrupting/strong] Social skills. . . . they don't understand how to make a phone call -they're texting- they actually have to talk to somebody . . .and learn how to talk face-to-face. That skill is invaluable - I want to get ahead of that. (Pat, f1a-2)

Early educators that participated in this study provided prolific data on their concerns over the lack of their student's social development. The relationship between social delay and technology has had an impact on teachers who consider the summative effects of technology on student development. The amount of exposure to technology has come under review by teachers who care deeply about their students and want to avoid exacerbating the phenomena; "so many kids go home and just stare at the I-Pad or that computer tablet or play video games all night. So let's let them socialize at school. Let's let them create and use their imagination here. I worry sometimes that they are just saturated, and they see things that I think they probably should not see -are they losing their . . . Kid-ness" (Nadia, f1a-1). Teacher concerns about student development and the relationship to technology extend beyond the realm of social development. K-2 educators also connect what they see as changes in the cognitive abilities of children to the described development phenomena.

Critical Thinking & Problem-Solving

A second area of concern for K-2 teachers evidenced in the results of this study is the decline of critical thinking and problem-solving abilities among students that educators

encounter in their classrooms. The following exchange between the researcher and Farrah provides the context from which these teacher perceptions arise:

> *Researcher:* You mentioned that there are now problem issues compared to when you started teaching - How would you describe these? Behavioral? Cognitive? Psychological?
>
> Farrah: …all of the above. I think there's a lack of problem-solving skills. That's a big thing for me. I'm sure their parents hate hearing problem-solving, but students will come up to me and say, 'my pencil's broken', So I respond with, 'Okay, what are you gonna' do about it? Go. Problem-solve it' - and I'm not being sarcastic. it's like, 'you <u>*can*</u> figure that out. Go and problem-solve" (Farrah, f1b-2).

K-2 teachers are concerned that the lack of social skills exhibited in the classroom will progress as an ongoing disadvantage as students mature. Opal worries that, "those kids are going to be fighting on the playground cause they have not learned how to solve a problem . . .they don't have the social skills" (Opal, f1a-1). This lack of development effects the student's capability to make decisions. Yara provides a warrant for claims of development delay in the context of ascendant technology:

> They don't know how to think for themselves because they're just doing what their next scheduled activity is . . . I also think technology plays a role in that fact now -the kids are addicted to iPhones. At three years old, they're addicted to tablets. They're just used to having a constant stream of stimuli and not having to respond back. (Yara, f1a-1)

Teachers are responding to the ramifications of these developments doing what they do best, adapting - "critical thinking skills have to be taught . . . so I have to grow in teaching critical thinking skills and we need to teach them to be better problem-solvers, which is using those critical thinking skills. I have to hone in on and develop even more in myself to help them"

(Amara, f1e-1-2). Yara continues, she is, "having to teach them that you don't need that constant stimuli" as part of a strategy that teachers are now taking to address the social development issues that students are demonstrating.

Teachers respond to the social development challenges of their students, by confronting a critical element they report as a significant contributor to this dilemma. This factor is integral to their professional practices, but is structurally inaccessible for teachers to correct. Xiu explains how, "I don't know what goes on at home. But- I know with a lot of kids I'd ask, 'What'd you do last time when you got home?' - 'I played video games all night long'. I think that there's probably some connection between students not having any of that social relationship building because they're just always on technology" (Xiu, f1a-1).

Parental Role in Social Development Delay

Teacher perceptions of the influence of parents on the technologically mediated social development delay as reported in this study are distinct. To examine the insights of teachers, Sophia is an exemplar and representative of the data. Sophia begins by offering an analysis of where her students are, "I would say it is like an 80/20 percentage of the kids who understand physical boundaries and emotional things like taking turns, congratulating someone, being kind and only 20% that get it and 80% do not understand" (Sophia, f1a-1). Though this does not provide any statistical evidence, it does allow for insight into the degree to which teachers perceive this problem. Sophia clarifies that, "I feel like it's growing" (Sophia, f1a-1). Finally, Sophia explains her frustrations with parents and a possible way forward:

> I feel like [social development] is something that I don't know if it's being skipped over or if it's something that needs to be addressed to new parents. If they don't know how to

introduce that, I don't really know how the problem starts and I don't really know how to fix it - except helping them when they come to school. (Sophia, f1a-1)

Teachers are not always as temperate as Sophia on the issue. This exchange with Wanda Reveals the frustration that teachers face regarding select parents:

Researcher: What can we do to help teachers with this issue when there are so many new things that they are being asked to do?

Wanda: Parenting classes? Parents need to know how to parent. It is a huge cultural issue that goes way past education - but it effects what I am trying to do here. (Wanda, f2e-2)

Val seconds Wanda's dissatisfaction and correlates student outcomes with a lack of parental intervention, "Most of my kids who are struggling, let's get real, their parents aren't the ones who are supportive at home" (Val, f2e-1). The annoyance that teachers have toward parents carries over to the behavior of students in the classroom. Bonnie describes a student who has, "zero filters and 600 channels on the TV . . .and he watches whatever he wants". Teachers correlate social development delay with technology use, and in many of their descriptions these claims are better described as causative. These teacher reports go to the heart of this study and stand as a significant finding. Bonnie continues her lament over her student with unfettered access to media by exclaiming- "he has no conditioning. He has got to be on the move going from one thing to another and he has no social skills. I wonder if anyone ever talks to him at home? It's very sad, he tries to interact at school with kids. He tries but it's sad" (Bonnie, f1a-1).

It is important to make the distinction that teachers do not assail parents. Instead, teachers report concern over parental policies in relation to technology. Thus, there should not be an impression that this study, this dissertation, nor the teachers themselves are broadly indicting parents. In fact, the researcher and report author has been a father to minor children for more

than 30 years of his life (and, er, has ample technology available in his home to his K-2 child . .). What is relevant to this study is that teachers find discordant outcomes for the use of technology and parents and teachers do not communicate regarding these issues. Mia offers an objective view of the problem and a path forward:

> I think that's when parents and teachers have to fill a role of remembering the social aspect of learning. There's a huge social aspect to learning, and we as Kindergarten teachers still want kids to know how to communicate face-to-face, because they have a hard time doing that - they're either looking at a screen or they see their parents only texting or they will see only communicating in ways that are not verbal. So I think that that it would have to be a big push for the families and educators and administrators, really, just in any job, understanding that face-to-face communication is huge. (Mia, f2-3)

Increase in Trauma, Anxiety & Stress

A topic of discussion with teachers in this study was the increased level of trauma that teachers are observing in students that come to their classrooms. Any discussion of barriers to the success of learning objectives in the classroom would be remiss not to include this factor. It should be noted that teacher participants did not find an explicit connection between technology and trauma and this identifies trauma as a potential mediating factor to the social development issues that teachers confront. Lucia elucidates the context of the issue and notes that, "we have a lot of trauma kids. We have a lot of kids who come from a divorce background or even have just one event that might have happened in their life, or maybe lost a parent (Lucia, f1b-1). The importance of the teacher is magnified in these situations as, "they come [here] with this need or this desire to just connect with someone or to have someone to just listen to them or have

someone to talk to. It's just built up" (Lucia, f1b-1). Teachers must sensitize themselves and undertake perspective-taking to be able to reach the traumatized child:

> We have to be aware of the child's experiences at home - the child's perspective. What is their lens? How are they coming to school and viewing it? Is this another place where I'm going to get mistreated? Or is this going to be a place where I feel love? So we have to have that perspective and awareness. (Denya, f2c-1)

As addressed in identity maintenance, teachers experience discordance with the culture in which they teach. As Toni discusses this issue, her cultural frustrations are at the forefront:

> Don't get me started on the trauma and socioeconomic issues of today. So many things have changed- the children – the family base- change and poverty and how that effects education. When I think about it, it's just astounding. They also have to have food in their belly, clothes and solid relationships. It may be *you* honestly - *You* may be the constant in their world. Without getting to deep. It's such an emotional thing, I swear it is like being a mother. (Toni, f2c-12)

Teachers are seeing increased trauma and a high degree of anxiety in their students. Cate wanted to let the researcher know, "It concerns me. I see the stress. We are seeing so much more anxiety in kids nowadays. There's a whole lot of worry in little kids . . .You just need a few more words per minute and you're there- You just need to get your writ score up to whatever . . . and they're little, little kids" (Cate, f2c-1). The academic pressure that Cate discusses here is precipitated by the standards that have been explicated in this study and they are only one of many areas of input that are represented by the feedback loop (Figure 2). Finally, trauma in schools is not the only influence that can be viewed as a mediating factor to the social development delays reported by participant teachers.

SES & The Digital Divide

Trauma has been reported as a mediating type factor for the social development issues that teachers are encountering. Similarly, the socio-economic status (SES) of students can contribute to the cognitive grade level delay that students experience as a result of lost opportunities. Socio-economic barriers prevent equitable access and capacities of technology as a result of the limited exposure to these tools. Despite research that suggests a lessoning of the digital access divide, SES factors were reported in this study as a barrier to the equitable delivery of technology in K-2 classrooms (Pew, 2018). The lack of technical resources have the consequence that students and their parents do not have the same learning or development opportunities as other students. It should be noted that these limitations are based on equity of support and do not indicate an inherent lack of ability in the low-SES student. Pat explains how SES technology gap is changing, "I think that even your low [SES] has something [technological] . . .It may not be the newest latest, but it's there -that's what they have, and they know how to use it very well" (Pat, f2f-1). Pat's points out how the gap is morphing from access to quality of access, where the SES student may have technological devices, but they are not current or up to date, causing reliability and obsolescence issues. Meanwhile, Mischa explains that her district has gone to fully online report cards but, "I guess the district is not concerned that people don't get it - because it's all online, no hard copies. So, I have parents this year, - three parents - who say that they cannot access it at home" (Mischa, f2f-1). Mischa and Pat's stories represent the problem of digital conversion and socio-economic diversity. As schools make decisions about how they will deploy their conversions and technical integrations, their decision can have a detrimental effect on certain students, who struggle to keep up, and teachers must find ways to accommodate them.

School district boundaries can include a wide range of socio-economic classes and this can magnify the problems of digitalization. Juana describes here lower SES students technology use where, "it's just that maybe they haven't had much practice at home" (Juana, f2f-1). In addition to the challenges to students, parents also face difficulties such as, "they cannot sign in on the class [app] because they don't have a computer or they cannot do [the class software] at home because they don't have access. Whenever you see that?- Yes, it is hard" (Inez, f2c-1). As teachers and parents adjust to these new realities, some districts are responding with programs to help secure digital equity: "Our district - they offer a discount plan for Internet for the families. But, I mean, that is an option. But you still have the problem of – what kind of plan? Or what Wi-Fi?" (Mischa, f2f-2). Even as Districts and schools are attempting to assists one aspect of the challenge, there is still the issue of devices that act as a barrier to the low SES student.

Perceived Relationship with Technology

The aspects of this theme have already noted several bases for how social development delays have been reported by teachers to relate to technology use and integration. In fact, it is difficult to find references from participants in this study regarding social development issues that are *not* connected to technology. Gina offers the correlation between technology and social issues where, "through use of the I-Pads my students have the ability to interact with one another. Those students who lack social skills tend to be the ones who suffer the most. For some reason, students who have difficulty socializing tend to connect with others through technology" (Gina, f2a-1). Amara explains how the influence of technology on social issues is significant, but is not exclusive; "more than I have seen ever before, kids are struggling with social skills, and a lot of that is because of technology" and she goes on to explain that technology has changed the life-world of children in that, "a lot of kids are staying at home – they are not out playing pickup

basketball games and such. So there are downsides to technology. [kids are] not interested in hanging out with people [and] just like being by themselves with the computer or whatever devices" (Amara, f2d-1).

Teacher reports from this study suggest that the attentional issues students are exhibiting are being exacerbated by the iterative use of technology. "When your kids are on an I-Pad - the world could be ending and they literally would not care. So to me, with all technology we lose some of the social interaction which at this age, they are learning . . ." (Kim, f1a-1). Bonnie adds that not only do children have the zombie effect, but they exhibit behavior of addicts where,

> . . . kids [without technology] act fidgety and they act stupid and disrespectful because they don't know what to do. I can't turn by back because they will go crazy because there is no stimulus going into their brains. If I turn the Smartboard off? [mimics gasp from the students]. (Bonnie, f2b-1)

Teachers connect technology and parental issues to development because of summative screen-time, "I think, because students have too much screen time at home - or I'm even questioning even more parents being on their phones too much and children not getting the attention that they need from their parents. I think that's huuuuge" (Farrah, f2-3).

Discordant Educational Outcomes and Recursive Identity/Agency Adaptation

The relationship of discordant educational outcomes to Recursive Identity/Agency Adaptation as discussed in Theoretical Finding #1 is that it marks a feedback loop to the recursive adaptation required to manage resources and maintain identity as a result of the integration of technology. It should be noted that the integration of technology is not the only input that brings about adaptation. It simply is the only one studied by this research.

Member Check Results for Findings of RQ#1–Discordant Educational Outcomes

This study included member-checking as a third layer of data and to provide a measure of validity to its findings. For RQ#1, eleven participants were queried about the findings of Discordant Educational Outcomes, Engaged Differentiation and Social Development Delay. All eleven member-checks agreed with the findings of the research for RQ#1. One response agreed conditionally- based on how well technology is implemented. Each theme of Engaged Differentiation and Delayed Social Development were found supported by the responses. Finally, the link of technology to social delay in certain instances, the need for further emphasis of social issues in the curriculum and the mediating issue of parental media policies were also confirmed through member checking.

Theoretical Finding/Selective Code #2

The Interdependent Stakeholder Communication Model (RQ#3)

Transition and The Interdependent Stakeholder Model (ISM)

The second theoretical finding of this study addresses research question #3 (RQ#3). RQ#3 asks what effect the integration of technology has on the teacher-student relationship. Educational environments are transitioning to new/mobile media as the primary means through which stakeholder communication takes place. This process has been made possible through the integration of new/mobile technology in educational institutions, and more salient to this study, through the provision of these tools to elementary school teachers. This study examines the influence of integration of technology on K-2 teachers and on constituent stakeholders, that is, the students and the parents of students.

Interdependent Stakeholder Communication Model

The Interdependent Stakeholder Communication Model - shortened to *Independent Stakeholder Model* (ISM) - describes a practical model of communication where; (a) educational stakeholders (teachers, students and parents) (b) participate in new/mobile technology applications to (c) communicate iteratively and collaboratively together (d) for the purpose of synchronizing stakeholder interaction, enriching communication, advancing student achievement and conveying student success (Figure 4).

This model is the product of grounded theory methodology that examined K-2 teachers in suburban schools in the Midwest of America. Thus, these findings are grounded to the data collected and analyzed from the suburban K-2 teachers and their perceptions of communication with student and parent stakeholders. As will be discussed, these findings contribute to the advancement of the understanding to their field of study, will offer new theoretical implications, provide paths for additional research, and allow for the transference of these results to similar conditions of participants and methods chosen for this study. However, the term "model" does not refer to a systematized model of communication. Instead, the ISM is a theory of the practical model of communication that is enabled though: (a) the mediation of relationships (b) the mediated ecology of the school environment and finally (c) parent participation in what will be described as "integrative applications". Note: the use of the term "mediation" in the ISM describes the use of media to alter the form of communication and does not relate to variables. Because these findings theorize stakeholder relationships from only one of the three potential stakeholders, this result is offered as a theoretical finding and not a grounded theory. The ISM provides a significant and relevant finding that was selectively coded, but requires additional research to be confirmed, as will be noted in the recommendations section of this dissertation.

The ISM posits that the successful mobilization of stakeholders to participation in the model is buttressed by two iteratively performed underpinnings, represented by Theme 7 *Relational Mediation* and Theme 8 *Ecological Mediation* (Figure 4).

K-2 Teachers are responsible to educate students according to prescribed benchmarks and standards. As a part of the execution of these standards, teachers are tasked to communicate successes and challenges to stakeholders of parents and students. These communications include classroom activities, student activities and student success/reports. Teachers are also asked to communicate how each stakeholder can understand and support the process through communication and participation. The findings of this study indicate that over the past several years, new/mobile media have been integrated into suburban classrooms. Over this time, teachers have been provided, or sought out, technical tools in order to carry out their work and, more specifically, to communicate with educational stakeholders. New/mobile media is functionally defined in this study as (a) tablets and smartphone type hardware and (b) apps and programs that advance communication and student data screening and analysis.

Certain applications, or "apps" have been developed and designed to centralize and enrich communication between educational stakeholders. These apps are also capable of centralizing student assignments and media and providing teachers with tools that can manage student output, student outcomes and stakeholder communication all in one place/software application. There are several of these applications available including SeeSaw, Class DoJo and others. Each of these applications may have some unique applications or include additional features. However, for the purposes of the ISM, the significant features of these applications are their ability to manage student's individual or collaborative output (assignments, media, papers, etc). Additionally, these apps afford the teacher the capability to quickly send and receive

messages to a single student, parent, or both, and also allow the teachers or users to create groups of students, parents, or combinations thereof, and send information to/through these groups or to an entire class. The teacher can also create and promote communication between stakeholders in chat/group chains or user groups. Thus, the teacher can provide real-time information to any stakeholder, or set or stakeholders, about student success or challenges, and can simultaneously provide the stakeholders successes, experiences, scheduling, travel/field trips, and corrections while fostering community by, and between, external stakeholders. Integrated applications are also designed to hold media files and have creative editing and other media tools and integrate with social media sites. Finally, these applications offer teachers the ability to send private and integrated grading information on student achievement and the social development of the student with a particular parent/stakeholder, at any time. For the purpose of this model, these apps will be described as "integrative applications" because of their ability to integrate: (a) communication channels (text, email, social media), (b) content (visual and text-based information) and (c) the stakeholders themselves (students-parents-and teachers).

This following description will explain the mechanism of communication in the ISM model, the comparative advantages of this communication model, the significance of the transition to the ISM, and the preconditions that have been practiced to foster the success of the model in recruiting participant stakeholders. Additionally, study participant accounts of the saliency of this model and will be provided.

The themes that encompass the ISM, *Relational Mediation* and *Ecological Mediation,* will be explicated as patterns of action that buttress the conditions for the successful engagement of participants in the integrative applications and the ISM. Stakeholders that utilize integrative applications benefit from the features of the ISM. The use of new/mobile media in the form of

integrative applications afford stakeholders the ability to enrich their communications and deepen their understandings of the educational process, the content being taught, and the context of messages:

> It's one thing to look at a kid or his parent and say, they need to be working harder and another to literally have a voice recording of the child saying – 'I don't know that word' when words are presented to them. It really has a made a level of transparency and ownership between the student-parent-teacher learning relationship that I had not seen before. (Kim, ISM-1)

The advantages of adopting this model are three-fold: (a) the time between the a message being sent by one stakeholder and the reception of that message by all stakeholders in greatly reduced, (b) the space over which these messages pass is redefined, and (c) the type and amount of content that can be transferred is fundamentally changed, and the context of messages and programs are clarified. Kim continues by explaining these features:

> When you have tech, the parents just know – they sit at the dinner table and say, 'I saw what you did today in school. How did you do that? You're so smart that you figured out how to get through all of that and turn it in, and you know it!' Really, It's so transparent . . . since becoming a parent and a teacher! - I think it's completely changed my attitude about the transparency. *I* want to know what my kiddo is doing at school. So now I completely understand why parents want to know what's going on at school. (Kim, tr11)

The ISM compresses the time required for messages to be sent and received. Though technically asynchronous, these communications can occur in real time and can be accessed instantly by stakeholders. The sheer breadth of the potential content and messages that can be communicated provide each stakeholder with a comprehensive picture of the educational environment and

provides them clarity to understand the priorities and foci of the classroom. Gina explains how the model works: “I'm trying to guide them through a reading passage. I can videotape that moment so parents can see. ‘OK, this is what's going on’. So if your questioning what your child might be struggling with - this kind of gives you an idea of how I'm helping them. I am giving parents a model, modeling to them what it should look like if you're trying to help your child to read” (Gina, ISM-1).

When utilizing integrative applications, there is no longer a physical space over which messages are sent. This virtualization of space further reduces the time constraints of messages and concerns over message durability or deliverability over space. Finally, the ISM offers the ability to send multiple forms of content in real-time and importantly, provides the ability to clarify these messages through the facilitation of ongoing chains of direct communication between stakeholders. An additional layer of accuracy to context cues can be garnered from the easily accessible chat-rooms, user groups and secondary inter-stakeholder communications.

The comparative advantage of the ISM to a traditional model of communication in elementary and K-2 classrooms is transformative. The traditional/historical model of communication between educational stakeholders can be described as tri-linear. In the tri-linear model, three distinct sets of dyadic communication are relied upon to deliver messages and content in a clear and cohesive manner. However, the barriers of time and space and the challenge of maintaining content meaning and the context of messages can decay as these three sets of dyadic relationships cross over each barrier (Figure 5). Zoey clarifies the point:

> The expectations with communicating with parents since technology has come into play has increased a lot. When I first started teaching, it was a phone call . . .and there was not a whole lot of phone calls made. Most of these parents at that point? - You weren't really

communicating a whole lot. I can remember writing notes and saying, 'Okay, have your mom sign this' and send it back to me. (Zoey, tr26)

Figure 5 represents a "pre-new/mobile" model of communication between stakeholders. In addition, it accounts for the advent of electronic communication and smartphones as an intermittent addition to the tri-linear communication model. It should be noted that electronic communications such as email and new/mobile technologies such as smartphones represent a middle ground where email and texting can occur. However, each of these forms of communication are primarily dyadic and only occur between the parent and teacher. Technology integration was ripe to be applied to solve this problem of communication between multiple educational stakeholders.

The comparative advantages of the ISM and using integrative applications can be described as transformative to the communication between educational stakeholders. In the tri-linear model, the majority of messages serve to maintain their linear characteristic, passing from teacher-student, then from to student-parent, and finally (if ever) back from the parent to the teacher. In the tri-linear model, the student was relied upon for message delivery and fidelity. (Figure 5) In the ISM, the inclusion of the student along the communication chain (where enabled) allows the student to be a part of the communication and educational intervention process without the responsibility of fidelity. Students have their own accounts where they can manage content in the student section and share their work with parents. Teachers can manage what content or messages are included in the student view, allowing the student to see communication between the teacher and parent and encouraging feedback where required. Gina describes a situation that explicates this idea:

After explaining the reading block . . .I had to pair up students so they could take photos and record one another. After viewing their videos, I approved them to the submitted onto the SeeSaw app for their family to view. The responses from parents I read included, 'Cute!' 'How funny!' , but one child who is extremely shy and who has difficulty speaking to others - she created a fantastic video! Her mother said, 'Great job, Girl!'. (Gina, ISM -1)

Figure 5.

Tri-linear Traditional Model of Classroom Stakeholders

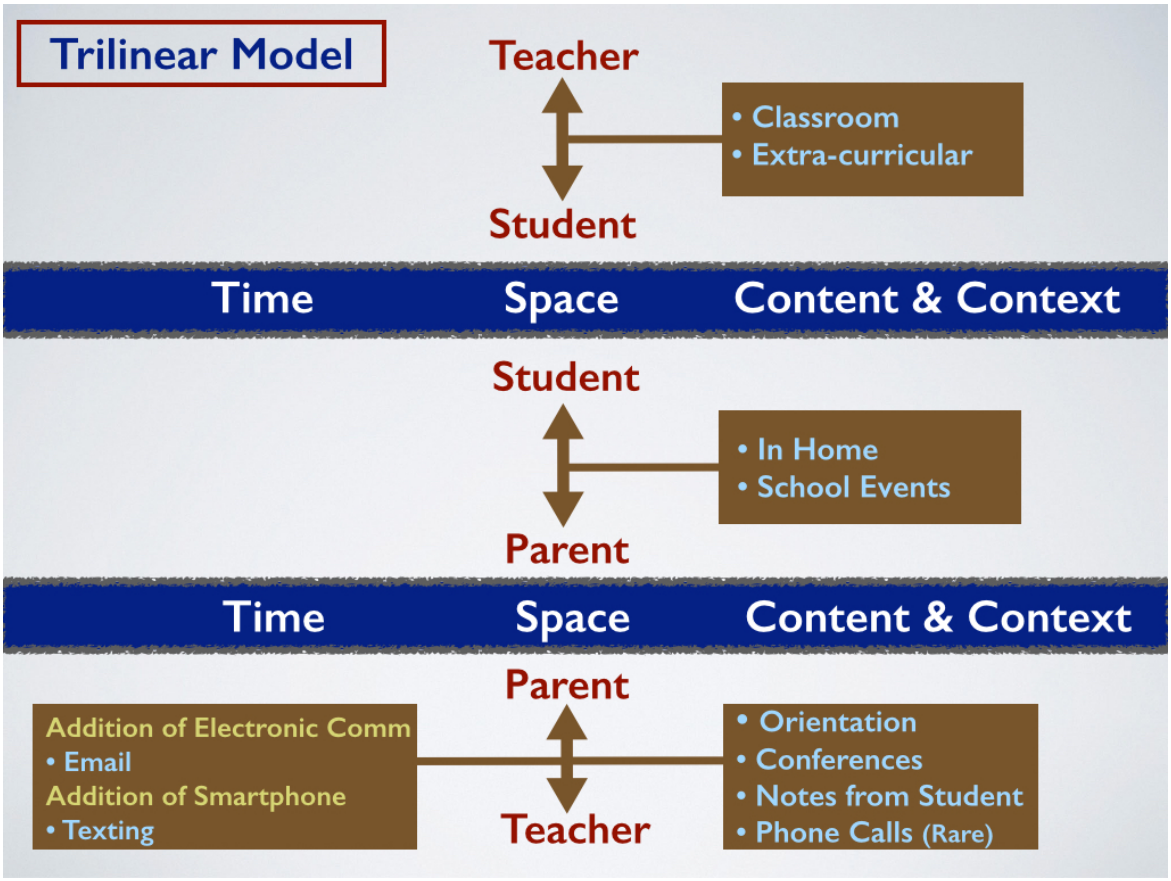
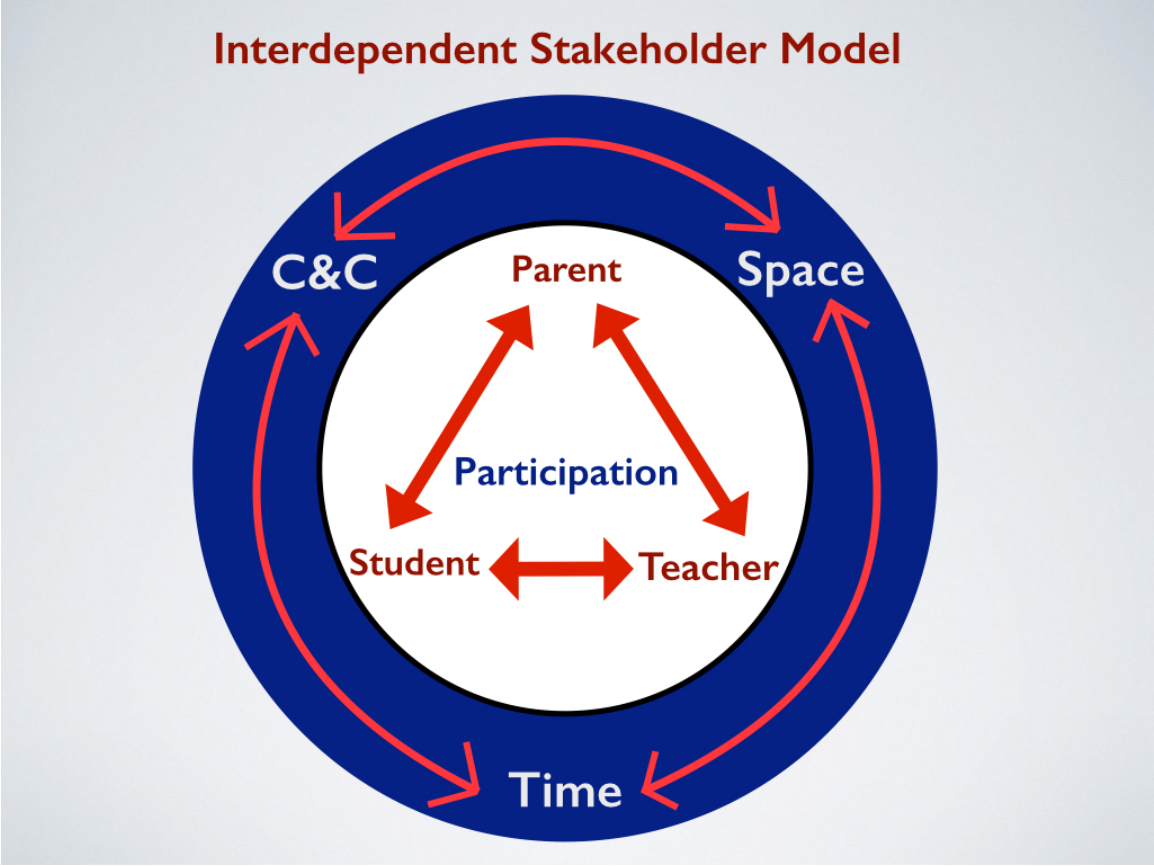


Figure 6.

Interdependent Stakeholder Model of Classroom Stakeholders



In the tri-linear model, the vast majority of messages are originated by the teacher. In the ISM/integrative application model, any stakeholder can initiate communication and advance learning goals or clarify messages. The result is an interdependent form of communication (Figure 6).

The real-time nature of ISM communication and the open platform means that each stakeholder is aware that all other stakeholders can see their messages, content, goals and priorities. As one stakeholder makes comments, sends messages, posts material or participates, these actions generate responses and action from other stakeholders. The ISM functions as an

interdependent model of communication. (Figure 6) Tonya explains how this interdependence works:

> We use the app SeeSaw and post journal entries on various things, like images, videos, and drawings. I used a photo of the site word list . . . the students read the site words and the app records their voice. I also mark the words that are read correctly and circled the words that are not mastered. I then share these assessments with parents. Each parent is able to access their student's accounts and see their student's progress. Parents make comments on the posts and can even contact me individually. (Tonya, ISM-1)

. ISM is a significant improvement to the communication process for several reasons. First, it compresses the time interval that teachers must wait on to advance to the next learning intervention or parent clarification. Second, the virtualization of the space between the school and home is all but erased, and the barriers of physical space are removed (i.e. students do not claim that their avatar dog ate their paper). Finally, and perhaps most importantly, the content and context of message clarity and meaning-making (C & C in Figure 6) has been radically transformed by the multiple stakeholder interaction that can occur in the ISM and through integrative applications.

> Definitely it connects our classroom to their parents a lot. It connects us to them in a way that we previously were not able to be connected. Students upload their work to SeeSaw and their parents can comment on their work. I can comment on their work. And now it's second grade and they're friends can comment on it. They can say 'good job'- and that's a big thing that parents can be really involved in the work. (Xiu, tr24).

Teachers can now clarify messages assignments and changes across stakeholders in one place and one time. Confused parents can clarify expectations and students are supported at higher

rates by parents who are now aware of their work, achievements and challenges. As can be seen in participant accounts of ISM, this model has increased student engagement and deeper participation, greater levels of parent involvement, accountability of stakeholder communication, improved student outcomes, and group synergy.

The advantages of the ISM are dependent on meeting several conditions. Foremost among these conditions is participation. Though it is true that all communication models are dependent upon the participation of their potential members, the ISM can only work if parents sign up for the integrative application. Zoey has managed to get almost all parents involved:

> I have class DoJo on my phone. So I carry my phone around with me all day and the post to parents that have signed up - which is all but one parent - any time that their kid does something excellent, or they lose a point for doing something that they shouldn't have? They get a notification on their phone. So we're communicating. (Zoey, tr26)

Once the parent has signed up, then the communication model can provide the described benefits. In addition, the model can only work at its maximum potential when the stakeholders continue to participate. Teachers must update and manage, and parents must check the application. Though participation can vary, once parents start participating the outcome can be dramatic - “If there's a couple of days that go by and we haven't really done anything that exciting and I haven't sent maybe a few pictures - It's not uncommon for me to get an email saying, ‘Is Class Dojo working? Is it working?’ I haven’t gotten any pictures?” (Zoey, tr26). Finally, this model of communication is dependent on access to, at minimum, a smartphone and more likely, the addition of a laptop or computer. These tools present a challenge to the equity of access because, as has been seen, not all students have equivalent access to technical tools. Some students may not be able to afford or access them at all, while others may be able to access some

of these tools but experience reliability and compatibility issues. Given these conditions and limitations, participant data suggests that the results of incorporating integrative applications have found remarkable results in the ISM.

The *Interdependent Stakeholder Model* made possible by integrating applications has transformed the way that teachers can communicate with students and parents. Students take ownership of their work and take pride in their achievements and the structure of the application makes possible student affirmation that closes this loop of scholarship. Bonnie explains:

> . . .when I had a struggling student share his wonderful work on Seesaw, I told him how proud of him that I was, I made our relationship stronger. He struggles with self-esteem but you could tell how proud he was when he recorded his voice telling his parents what his assignment was. (Bonnie, tr2)

The transition from the traditional/tri-linear model, where communication transparency was shrouded by time and space (Figure 5) has been replaced by a model where stakeholders can now virtually enter the classroom. Kim provides context:

> " . . .from a parent communication standpoint, it makes the learning and the abilities a lot more transparent. The old school way of knowing what your kid is doing is conferences and report cards. But now, with the SeeSaw app, I can have the kids upload whatever they need or whatever I want - they can show a skill to their parents. Their parents can immediately get on and can like it, see it, and listen to their voices. (Kim- ISM-3)

The integrative applications that buttress the ISM can temper the issues of boundaries and FERPA that teachers face while simultaneously providing the very information that precipitate parents to cross those boundaries:

> I can individually send grades to parents . . . there is still confidentiality for each student and nobody else is seeing anybody else's grades or how they're doing. But I can send messages directly to parents. They don't have my phone number, but they can message me back. So I can send things through the messaging. I can send pictures of their child or I can send messages about how they are working, I can send their sight word checklists and where they're at with their sight words. So the parent has direct access to their school-work, and it's like an online portfolio, too. So if the kids do something that they're proud of, I can put it in their portfolio and I run all that through my I-Pad. (Mia, tr28)

Finally, technology has ben criticized for truncating communication and reducing the essential quality of relationships (Zeoli 2018). The data collected for this study suggest that when applied within the context of the ISM, the integration of technology can improve interpersonal and family communication, while offering a new layer of accountability to the teacher-student-parent relationship:

> They know I'm in contact with their parents. I think it helps with their relationships with their families when they go home. Instead of ten years ago when my students got asked, 'what did you do at school today?'. And the kids were like, 'nothin'. Now-Parents know what they did because the parent saw it on SeeSaw! So instead of saying 'what did you do at school today', they can say things like, 'Well hey, I saw you guys. You were measuring with apples today. Tell me more about that'. Or maybe, 'I saw that you guys had a guest reader today -what did they read?' So it helps initiate conversations that might not happen between parent and child. (Val, ISM-3)

Member Check Results for RQ#3 – Interdependent Stakeholder Model (ISM)

This study includes member-checking as a third layer of data and to provide a measure of validity to its findings. For RQ#3, fifteen participants were queried about the findings of discordant educational outcomes. All fifteen member-checks supported the ISM and/or elements of the ISM that address RQ#3. Three comments concurred with the conditions of the ISM described in the dissertation and its limitation of SES dependency. One comment agreed with the theory of ISM, but qualified the desire to continue all modes of communication, including those in the tri-linear model. One comment agreed with the benefits of the ISM but specifically added the benefits of phone calls. Participants specifically confirmed the ISM features of; Relational Mediation, Ecological Mediation, increased student participation, parental engagement, stakeholder accountability, enriched communication, compression of time, virtualization of space, and affirmation of academic results.

The ISM and Mediation

Research question #3 is answered by the *Interdependent Stakeholder Model*. The final aspect of these results explicates two themes that provide the manner in which stakeholders are habituated to the use of technology in classroom and in educational institutions. These themes elucidate the move from the traditional model to a model of parents and students converting the instructional communication practices to the digital domain. The results of this study produced data that supported two areas for this phenomena: *Relational Mediation* and *Ecological Mediation*. The term "mediation" describes the process of normalizing new/mobile technology and digital practices in what have been traditionally considered non-technical domains. Relational Mediation then, describes how digital and new/mobile technologies have been

normalized in educational relationships. Accordingly, Ecological Mediation describes how digital and new/mobile technologies are normalized in the ecology of educational organization.

Theme 7 Relational Mediation

The two themes that support the ISM are centered on unique aspects of how K-2 students experience the culture of the school, through their relationships and through the environment of the school itself. Theme 7 focuses on the relational forms and channels of communication. As noted, the use of the term "mediation" is used to engender the sense of how forms of communication (interpersonal, group, mass) are reoriented and normalized as occurring through media and technology. Thus, *Relational Mediation* describes the process through which the use of technology and media is normalized as one means through which students can experience educational relationships.

There are several features of *Relational Mediation* that prepare stakeholders for participation in the ISM. *Technical Readiness* references the level of technical capacity, the ability to learn technical methods, and also includes the level of motivation that an individual student may have toward the incorporation of technology and media. Teachers reference these conditions as a means to understand and introduce technological integration. *Student Mediation* describes the interpersonal communication that takes place between teachers and students. K-2 educators describe how technology integration has been utilized to reorient to these practices as consistent classroom interventions. *Stakeholder Mediation* includes the use of technology to foster interpersonal communication with parents or other stakeholders. *Collaborative Mediation* describes the use of technology for group communication with students and teachers. As these practices are iteratively performed they become a new normal that incorporates technology and

media. Finally, *Intentional Pedagogy* describes the manner in which early educators are using technology to build student technical skills.

ISM theorizes that all of the features of *Relational Mediation* advance the acceptance of ISM as the means through which the teacher-student- parent can be transformed from a tri-linear model to an interdependent communication model. Though these factors are not exclusive in their effect, each of them help to normalize the technical mediation of communication.

Leveraging Tech Readiness

Teachers and schools have been tuning their approach to the readiness of students prior to school and their level of comfort and knowledge with technology. This readiness has created a syncopation between the technology that schools actually offer and what students are accustom to utilizing prior to their arrival. Early educators understand that young students have technical capacities that are sometimes surprising. Juana explains that, "I can put a new app in front of a child, and I don't even have to explain it to them. They can usually figure it out . . .I don't have to give them instructions" (Juana, f7a-1). Contemporary students are using technology at increasingly young ages. Lucia notes that, "even when my oldest was like nine months old, I handed him my phone . . . and next thing I know the phone was playing music. I didn't even know my phone could do that from the lock screen. Kids have this innate ability to just figure things out" (Lucia, f7a-1).

Educators can take advantage of the readiness of the current K-2 student because they have a technical background unlike any other generation of students:

> I mean, kids are making I-Movies at home. Why would we pretend that they don't have those skills, You know what I mean? Like, they're doing it at home. They're doing it

> outside of school. It doesn't do them any good to pretend like they don't have that ability at school to show us what they know. (Kim, f7a-1)

Kim's explanation of the attitude of teachers reveals how leveraging tech readiness works. The benefits of this practice are that students feel more connected to their teachers as a result of the increased relatability. As Mia states, "by using technology to teach, it really enhances learning along with teacher-student relations because it is relatable. Kids are constantly learning from technology at home. When it is brought into the classroom and used as a tool, the kids are very familiar with it" (Mia, f7a-1).

Once students enter school, teachers can still leverage the skills of students as they are proffering their technical skills to the teacher and the class. This can be seen in Mischa's statement that, "at six and seven- a lot of times the kids figure out the technology. I mean, they can do it. They're showing *me* how to do it" (Mischa, f7a-2). Val describes a similar situation where students, "are showing pre-service teachers how to integrate it where it's developmentally appropriate within the age group" (Val, f7a-1).

Student Mediation

As the contemporary student enters school, they soon realize that they will be utilizing technology that they are familiar with. Though students will have to learn more technical tools, the atmosphere of technology integration, "helps when building relationships in the classroom and to make things fun" (Kim, f7b-1). Thus, contemporary students are engaged with technology so they can feel comfortable and relate to their new atmosphere. As Kim further explains, "it doesn't have to be all work and skill and drill all the time. They loved seeing themselves with the filter, and when I showed them each other on the Smart Board they were giggling away" (Kim,

f7b-1). Early educators build student interest by treating them in such a way that they are motivated to reach higher with technology.

> They loved trying to explain to me their strategies and methods like they were video game programmers. I, in turn, listened and gave all my attention to whoever was sharing as I walked around. I tried to give each student that I spoke to, their own individual time that helps reinforce to them that their experiences, thoughts, and interests are important to me and thus helps strengthen our relationship bond. (Mischa, f7b-2)

Teachers engage students with technology to have fun together. As early education becomes standardized through testing and oversight, retaining some fun is critical. As Cate testifies, "I love when we can search together and find that answer. I also get a huge kick out of someone who worked really hard to try to master a particular level . . .and I celebrate with them" (Cate, f7b-1). Technology becomes more than a tool when this posture is taken and educators find ways to reach students on the relational level- "Technology also helps bridge that gap because it gives you a common thing to discuss or a common thing to talk about with them" (Mia, f7b-1). Student Mediation provides students a familiarity and comfort for using technology in a relational context.

Stakeholder Mediation

Just as building relational legitimacy through technology can build student normalization of technology use, the same strategy can be applied to the normalization of technology in other educational stakeholder relationships. Though the results of this study do not ascertain if these patterns are intentional, it does make the claim that the strategies have been effective in laying the ground to introduce an integrated model of communication that fosters the ability to retain those who choose to participate. One step in this process is to promote the use of these technical

tools. When using a photo application, Kim noted how, “The parents thought this was super fun too and many commented how much they love seeing their kids exposed to so many things with technology” (Kim, f7c-1).

In order to gain parent participation in the ISM, teachers build connections with parents using class applications that are mandatory for parents to load onto their phones during orientation and enrollment. As Denya reminds, “we have to connect with the families. So technology is also important whenever non-related to the classroom when you’re connecting to the parents” (Denya, f7c-1). Elsa uses a strategy to get parents attention and motivate them to get involved and eventually participate. “I’m videoing the children, telling about their work, and then the parents get it - that builds great relationships - it’s an artifact for the families to have for years to come” (Elsa, f7c-1).

Stakeholder mediation has additional benefits that teachers have identified. Amara communicates that when she was sending visuals to parents, “one of the parents saw their child sitting all alone. So the parent chatted that their child was in trouble. I said, ‘No! - he’s been doing great!’ and they said, ‘Thanks for telling me that’, [and now they could talk to him]” (Amara, f7c-1). In addition, the strategies that teachers use to communicate with parents fosters communication and relationships with other stakeholders; “As a teacher, I just learned that technology is just a great way for collaboration that teachers use to communicate and share ideas, and to collaborate with parents, collaborate with admin, collaborate with people outside of and the school building and across the world” (Tonya, f7c-1).

Collaborative Mediation

In furtherance of the relationships that are being built through student mediation, collaborative mediation leverages students pairing and grouping of projects and play in order to

build normalization with technology. This process is very easy to achieve as Kim describes, "this stuff starts drawing them in, and builds that interest. They realize, 'you know what? I'm good at this, and I enjoy it'. And it just opens other kids who are like, 'What!! How did you do that?' So kids are teaching other kids some of the things they are learning" (Kim, f7d-1). As Amara adds, collaboration is, "probably one of the most important skills classroom management is being able to figure out who can help you in the peer tutoring, whether it's with technology or media" (Amara, f7d-1).

The use of technology to build relationships is both symbiotic and summative. There is a very positive feeling about technology integration in schools and this use of technology across relationships accounts for some of that valence toward technology. The use of technology seems to increase the amount of work done - I've been assigning more work in Seesaw during center rotations for both literacy and math and I noticed a higher amount of collaboration and engagement" (Kim, f7d-1). The leveraging of these tools are in and of themselves motivators to advance the brand story of school to be at its center, technical. Lucia provides a prime example:

> I had one kid who had just finished a guided inquiry unit, where they researched either US symbols or Civil rights leaders. So he chose Rosa Parks, and he was trying to express about how you know how Rosa parks why she did what she did. His question was like, What impact did she have on segregation? He ended up using the technology Garage Band to make music. We had a fifth grader who was an expert who came in and helped him create, and they created a steady beat. Together they were able to take the words [of Rosa Parks] that he wanted to express and share, to answer his question and just made her words go to his beat. (Lucia, f7d-1)

Intentional Pedagogy

Approaching technology as the means to leverage diverse relationships and cultivate an attitude of progress is dependent on a key axis through which all these other relationships can thrive- the teacher. The teacher acts as both the instigator and manager of these relationships and the success or failure of the ISM is dependent on the motivation of the teacher to take ownership in a fundamental way, the basis for technology integration. Where there is a positive conception of technology integration, there will also be success. Teachers will eventually start to integrate technology into other aspects of their work and "app smash" in order to fully engage students. The diversification of instructional communication through technology is one measure of its acceptance.

The integration of technology across the curriculum provides the teacher a palate that they can chose from at will, reducing prep time and alleviating frustrations with old curriculum. Juana talks about how she uses technology in her Social Studies, "if we're doing Social Studies and we're talking about maps and I have them on Google Earth and Google Maps and we find their house on the map, you know they are helping each other. But they are still learning map skills" (Juana, f7e-2). As teachers and students build relationships with technology, perhaps the most important feature of integration is fun. Sophia explains that, "the reality is [technology] captivates them and they think it's fun. And I want to go with that because - school is fun. And if that's how you like to learn, let's try it this way. So I'm all about technology as long as it's as interactive as we can make it" (Sophia, f7e-1).

Theme 8 Ecological Mediation

The second theme that informs the ISM is the ecological mediation of the organization/institution in which technology integration is occurring. The second aspect of student experience that is "mediated" through the normalization process is the ecology of the school itself. Elements that make up this environment are experienced through the technical, and digital domain and condition how these structures are experienced.

There are several features of *Ecological Mediation* that prepare stakeholders for participation in the ISM. *Scaffolding Technical Culture* describes the way that the extant technical culture is further modified to foster a change to the integration of technology. *Emulating Technical Preferences* describes how the school and teachers in the school are sensitive to the manner in which people use technology in order to make integration of technology a more palatable process. *Engagement in the classroom* describes the manner in which the use of technology in the classroom is prioritized in order to normalize its further use. *Gamification* describes the use of games as a pedagogical strategy in order to relate to the culture of children's (and adults) use of games, and to leverage these patterns of use to normalize integration of technology. *Integration Practices* describes the strategies of educators to find ways to make the use of technology more palatable and useable for K-2 students.

Scaffolding Tech Culture

The transition to digital communication in the environment of the school includes the manner in which technical culture of the school is further changed to provide normalcy to the use of technology in educational and cultural practices. The data collected for this study provide an understanding of how this process takes place. Toni provides an example of student edification where students who work on an online math program receive awards, "Three of my students

received awards this morning – celebrating that they were 60%, 70%, or 80% . . . they were proud and excited for that piece of paper! They are encouraged to do their work to reach daily goals at home as well" (Toni, f8a-1). When this occurs, other students can see this process and work to also hope to be on that stage and on the school social media sites.

The school district and administration acts as a means to promote the transition to technically-based school experiences. Some schools have formal policies that, "put such an emphasis on our digital conversion . . . they're trying to get technology into the hands of students" (Juana, f8-1). Administrators and educators are working together to find the means to achieve this through training and grant writing for both technical and skills based training. Lucia notes that her principal supports her professional development and, "we asked her and she had funds so she sent us to a couple classes" (Lucia, f8a-1). Other programs seek grants to build tools and screening devices such as, "what comprehension strategies they need" so schools find ways. "to write a grant for it every year to get it" (Opal, f8a-1).

Teachers and administrators find ways to get the work done for whatever they do and it is part of their personality to work hard to get what their students need. Technology is no exception. The most revealing phrase that was uttered to explain the attitude of finding a way to get things done has to do with the view of outdated policies and red-tape that might get in the way. One teacher noted, "the beauty of having a principal who gets it is that you can do what you know. People say, "shut the door and do it anyway. I can still do that" (Toni, f8a-1).

Emulating Tech Preferences

In order to aid a transition to the digital conversion, teachers are sensitive to the manner in which students and parents utilize technology. These wider practices operate to normalize the transition to technology in the educational institution. The most obvious way that this can be

achieved is by mirroring the technical practices and preferences of their constituents. Amara offers her perception of the role of the student and integration of technology, "to be honest with you, with a lot of these apps, the kids know how to do it better than I do. So if the District is going to get training for me -- or look to the student, that's very proficient at that? I'm going to ask the student" (Amara, f8b-1). Teachers rely on students to support their own technical "conversion" and they use this as a form of modeling. Lucia described one such situation:

> Even the other day - we were coding and the 5th grade teacher had to call a kid over to help because 'Okay, I can't get this to stick. What am I doing wrong?' And the kid came over and the kid fixed it. So part of it was allowing ourselves to say, 'We don't know a lot. We're learning. You're here with me. Let's learn together'. (Lucia, f8b-3)

The central task of education is learning, and curriculum is the stuff of education. It should be no surprise then - that curriculum is targeted for digital conversion and integration of technology. Ross lets us in on the plan, "And so that digital immersion is going to be deeply embedded within our curriculum instruction, moving away from those paper/pencil tests" (Ross, f8b-1). The move to make curriculum more technically based is not without merit because of the capabilities that young people have with technology. Ross continues by describing the perception of the K-2 student, "by second grade, here, they know how to type, they can make a presentation. I mean, my six year old showed me how to mirror my I-Pad this year" (Ross, f8b-1). A final adjustment in the attitude of teachers, and in the curriculum for students is to reduce technical redundancy by considering the skills that students already have. Xiu shares how she has adjusted her teaching to account for the current capacity of students

> "So when a lot of my kids came to me, I didn't really have to take a lot of that time to teach them a lot of those tools that we've used before- they knew how to use them. They

were like, ‘we know how to do this’ and so that’s kind of nice that they can do it. They know what to do. (Xiu, f8b-1)

Engagement with Technology

Just as Xiu spoke of the skills and proclivities of students in school, so too does the engagement with technology have an effect of transitioning stakeholders away from the analog means of educating and towards the digital conversion. Juana picks up this thread by explaining that, “they’re encouraging us to incorporate it more in our classrooms, and they’re causing us to think more technology-minded as well, you know especially with introductions of STEM into everything” (Juana, f8a-1). Strategies for learning can foster the transition to technology integration. Mischa discusses the use of QR codes to build, “the teacher/student relationship, because learning was more of a two-way street” and goes on to report that, “students were more engaged in their learning since they were active participants” (Mischa, f8c-1).

The use of intentional engagement in technology has an iterative effect on students. Mia describes how, “The adaptations I make during the lesson are based on engagement level” (Mia, f8c-1). This priority is so fundamental that, “if my students aren’t engaged, I stop the lesson and turn on a “dance break” for us to get some energy out” (Mia, f8c-1). Students become accustom to technology in their own communication and interactions can become tech-based. These experiences are viewed positively by students and teachers, and as Mischa explains, “I learn more about them and their interests and we are able to make more ‘fun’ connections” (Mischa, f8c-1). The move toward technology is reflected in classroom practices, both on the part of students and teacher. There is a sense of inertia in the conversion and the approach to a tipping point where stakeholders start thinking about technology, no longer as a target or goal, or just a

transition, but as a new normal from which a deviation would be more surprising than the continuance of previous practice.

Tonya uses the practice of app-smashing in her class. App smashing occurs when the product of one technology is incorporated into another technology. One such "app smash" was described in the following report:

> The students discovered a new game that involved creating a play doll character and scanning it onto the I-Pad. After scanning, the I-Pad game forms the picture into a 3-D image and it becomes a character to play in the game. The students were completely fascinated by the 3-D figure and began to teach their classmates how to follow the directions to make their own play doll figurines come to life. (Tonya, f8c-1)

Tonya's learning intervention highlights the synergy that students can exhibit with technology and undergirds the reasoning and momentum behind the normalization of the digital conversion that many school districts have already begun, will begin, or continue to execute. Tonya provides a final insight into the seemingly inevitable move towards technology as classroom practice:

> But if it's engaging for the students- if it's easy to implement and easy to keep track of, if I can use it to assess my students?- That's huge, because that will show me if it's actually, -- if my students are learning from it or if it's just something that they're doing to be on the I-PADS. So that's usually how I decide which apps should be used or if that device should be continue. (Tonya, f8c-1)

Gamification

Gamification describes the practice of game play and its elements when applied to other aspects of learning in the educational context. The manner of gamification delivered in the K-2 classroom is diverse. Lucia uses it for her differentiation strategies and, "both [my] programs use

gamification to reward and encourage students to improve. It provides me with data and skills my students are struggling with and allows me to teach one-on-one skills during my intervention time" (Lucia, f8d-1). Students find games engaging and the "everybody wins" pedagogical strategy is used by many teachers to deliver learning objectives. Nadia uses games to motivate her students, "But I don't think I realize how much I do collaborate with games. Anything that's a game?- Kids love, because they don't think they're learning . . .really learning" (Nadia, f8d-3).

As with the other ecological mediations, participants describe how gamification also brings out a synergy of collaboration in students. Tonya explains:

> It is exciting to watch the students teach and explain to their peers how to play a game or how to get a specific website. Not only does the student learn from their peers, but the expert student is learning by teaching others. I know that I can ask these expert students to guide their peers in future classroom lessons and activities that involve using computers. (Tonya, f8d-1)

As with all technology, games also get students engaged when they play games. This sense of play should not be confused with a lack of learning. In fact, teachers have become experts in utilizing gamification to advance learning in the classroom. Pat notes what she gets from her students, "they're learning, their working through it, and it teaches them if they mess up. It goes back and it makes them do it over and over until they get it" (Pat, f8d-1). A final point on play is that it should engage the entire classroom and the skilled educator can manage this feature to support their students self-esteem. Nadia describes just such an event where games, "give me a chance to see the kids who are normally in the background really offer them a second in the spotlight. They can shine and get the accomplishment that is sometimes overshadowed by those who are quicker/louder" (Nadia, f1-d-1).

Integration Practices

K-2 educators are dedicated professionals. When they are tasked to utilize technology to attain learning objectives, they will use all their tools to do so. The use of integration practices describe strategies that educator utilize to identify best practices for the integration of technology in their classrooms. To best provide these strategies as represented in the data, the following examples provide a snapshot of the means through which K-2 educators use their talents.

• "At one center the kids log onto Epic and choose from a collection of books that I have created to listened to on a certain subject. At another center the kids used the iPad to scan a QR code that corresponded to a word that began with a letter we were wor4king on. Once the word appeared on the iPad, the kids copy the word and then find another QR code to scan" (Amara, f8e-1).

• "Lessons were structured in such a way that I delivered the learning point and strategically followed up each point with a short video that helped with application" (Denya, f8e-1).

• "Then we would have technology time where we would share ideas as a staff. [We talked about] what we were using and try to give each other ideas. Sometimes it's hit or miss. Sometimes you try something you're like 'We will not be doing that thing from last year- that did not work out the way'" (Lucia, f8e-1).

• "My partner and I lesson plan together. Since this is our third year together now and we're really focusing on doing things a new way this year. [We want to be] incorporating the technology and some of the things that we've gotten access to" (Kim, f8e-2).

Closing

One grounded theory, two theoretical codes, eight themes and the concrete support for each theme have been presented in this findings section. The results reported here represent 33 hours of initial interviews with 28 K-2 teachers. 25 teachers also provided elicited text journals

that yielded an additional 200 pages of data. Over 5000 initial codes produced 82 topical and analytic codes that begat 40 open codes and the eventual relationships found here in these outcomes. Finally, 16 teachers granted an additional 5 hours of member check interviews to substantiate the findings of this study and each major finding was explicitly confirmed.

The findings presented in this section provide a detailed view of both the concrete results of this study and the conceptual relationships between the data that buttress the themes and theories that have been described. These findings are representative of the mandate from Christians and Carey (1989) who exclaim,

> Qualitative studies start from the assumption that any adequate theory of communication will be historical in a dual sense: it will be grounded in the knowledge of what communication has been and how it has become what it is, and its theoretical propositions will be designed to account for this historical and comparative variation. (p. 357-358)

In order to fully appreciate the significance and implications of these findings and attendant theorizing, the next chapter of this dissertation will discuss these findings in the context of their field of study, the implications to theory and practice, and to the culture writ large.

Chapter 6 Discussion

Introduction

The integration of new/mobile technology and media in the primary classroom embodies the ubiquitous normalization of mediated communication. As technology improves efficiencies, specializations, and assemblies of process, it also demands conformity and adaptation to a regimen of practice. Teachers have been placed at the fulcrum of the integration of technology in schools, because they must: (a) understand the intricacies of the technology being implemented and (b) comprehend the pedagogical implications of their deployment. Early educators confront the revision of knowledge, practice, and personhood as they integrate technology in their classrooms. The contemporary K-2 teacher is the first generation of early educators that incorporates technology in order to keep pace with the technical and media expectations of young learners. This dissertation and the research that supports it made an inquiry of these composite phenomena and explored the ramifications of their coalescence. The following discussion will: (a) provide context to the findings (b) discuss the inclusive implications of this study (c) examine the theoretical and practical implications of the outcome for each research question and (d) propose limitations on this research and recommendations for future research.

The research that supports this dissertation investigates the manner in which K-2 teachers are being influenced by the integration of technology. This posture is delineated from investigations that measure the effect of "a" technology on teacher practices. As a result, *this* inquiry seeks to understand how the integration of technology influences communication practices and processes and examines how this added component has altered the fundamental mandate of instructional communication and educational outcomes. The resultant research asked three questions to elucidate the phenomena: (a) how do K-2 teachers evaluate the integration of

technology on the learning outcomes they desire to achieve (b) in what ways has the integration of technology had an impact on the process of K-2 teaching and on the teachers themselves and (c) in what ways has the integration of technology influenced the K-2 teacher-student-parent relationship? It should be noted that in the process of theoretical sampling the word "parent" was added to this last area of inquiry. After several initial interviews, data collection uncovered that teacher-participants viewed the influence of technology integration on the teacher-student relationship as inseparably inclusive of the relationship with parents.

A qualitative research approach was taken in order to examine the impact on process and relationships that teachers reported through their experiences. Grounded theory methodology was chosen to provide an empirically based examination of the phenomena. Grounded theory methodology was supplemented by interpretive phenomenological techniques that supplemented the grounded approach in order to foster sensitivity to the strong cohort that the K-2 teachers represent. Suburban elementary districts and school sites were chosen for setting of the study. This decision was based on the diversity of the penetration of technology in schools as of 2018. As can be seen in Table 1, the decision of research sites produced results that reliably examined the targeted phenomena of study, and was able to secure data at a time when participants had the requisite level of maturity with technology integration in order to make salient evaluations. Grounded and phenomenological methods included a three –pronged approach to data collection. 28 Semi-structured interviews were followed by the collection of 25 elicited texts and finally, 16 member-check phone interviews. Theoretical sampling, memo-ing and 3-phase coding of data produced eight themes and two theoretical codes that correspond to the three research questions queried.

Overview

The results of this study of K-2 teachers demonstrate that the integration of technology in the K-2 classroom: (a) has a transformative effect on delivery of learning objectives (b) has integrated interpersonal and group communication in classroom stakeholder relationships and (c) produces the recursive adaptation of resources and identity in order to alter organizational structure and communication. The results of research question #1 indicate that the utilization of integrated new/mobile media technologies has constructively altered the delivery of learning objectives and Instructional Communication through the improvement of K-2 teachers ability to engage students and respond to their academic needs. The grounded theory of Recursive Identity/Agency Adaptation answers research question #2 by explicating the iterative adaptation that K-2 teachers perform as a result of the integration of new/mobile technologies, and the interpersonal and group communication they undertake for the purpose of managing their resources and identities. Research question #3 results are addressed by modeling how interpersonal relationships between the teacher-student, student-parent and parent-teacher are leveraged through the integration of new/mobile technology to generate an improved form of group mediated communication between the stakeholders as described by the Interdependent Stakeholder Model.

Examined inclusively, the findings of this study can be viewed as a harbinger of the integration of new/mobile technology and media on interpersonal and organizational communication practices. This research opens a corridor to discuss these practices and their implications to this dissertation and its field of study. In this context, this research asserts that the integration of technology: (a) acts as a catalyst for structural change, (b) modifies the nature

and/or form of communication in its stakeholder/members, and (c) (re)prioritizes the temporal consciousness of communication and interaction. The remainder of this discussion will first discuss these cumulative understandings of the results, followed by the theoretical and practical implications for each of the three significant findings. Finally, limitations will be discussed and recommendations for further research will be addressed.

Technology Integration as a Catalyst for Structural Change

Individuals and groups interact and utilize communication technologies in order to understand each other, their situations and themselves. The results of this study recognize communication occurring at the interpersonal level, the group level, through media applications, and the extensions of these forms of communication into larger public spheres. Teachers explained how they utilized technology to individually differentiate instruction for students and used applications to make their work more efficient and rewarding. Key findings include technology integration catalyzing an unprecedented engagement in students, and collaboration between students and among teachers. Finally, the use of technology in social and communicative systems is manifest as a catalyst for structural modification in the results of this study. The iterative lament of early educators on the increase of standardized testing is only made possible by technology that affords the wide dissemination of these programs and the structures of data that scaffold their efficiencies. Teacher participants describe how technologies alter the social expectations of students, itself a structure, as the introduction of programs allowed increased performance(s). These technical modifications should not be viewed as additive, but are described as the structure through which a lesson, goal, or task is achieved. Even in name, students no longer study “reading”, but are now doing “ fill in name of program” such as Master Connect, etc.”. Educators find that they are under increasing time demands

because they must manage new structures of communication, data and instruction. Finally, the student-teacher-parent relationship that is so greatly improved in the ISM, is contingent on participation in a technical structure that catalyzes these relationships and the subsequent benefits, which in turn, act as social structures in their own right.

Findings of this dissertation reveal that integration of technology not only accompanies structure, or acts as a contingency of it, but new structures are formed through its utilization and triggered by its presence, whether they are material, or social in nature, or both. Where challenges to teacher productivity were experienced from the result of technology integration, teachers managed these issues by creating cohort collaboration groups. This new social structure provided teachers with valuable support and knowledge. In addition, the ISM is promoted by schools in order to increase student-teacher-parent relationships. However, as practiced and when introduced, the ISM forms additional structures between parents that can independent needs. Teachers might opt to craft new response structures by managing data that in turn is implemented as instructional communication or pedagogic strategy. The structural catalyst found in the integration of technology provides a pivot point for further inquiry.

The alteration of structure through the integration of technology is contingent on the perceptions of social actors and the substantive basis of communication. A K-2 student accommodated the demands of teachers who they view as authoritative. Yet, as has been seen, teachers must adapt to substantive modifications to the technical/material demands that premise their educational prowess. Boorman (1982) provides context to these fluctuations and theorizes that transitions are the convergences of symbols that enable a foundational narrative structure for teams to act and react. In an article addressed to "Teachers and Consultants, Borrman (1982) claims that, "communication is a necessary but not sufficient condition for culture. Other things

are required such as material goods, artifacts, tools, and technology, but without communication, these components could not result in culture" (p.1). Here, Boorman (1982) sets the stage for the interdependent relationship between technology, materiality and the social culture that can deliver information and knowledge. The interrelationship between: (a) the "social" /socio-culturally imparted knowledge and (b) the material/sensorial-ly imparted knowledge have been the subject of a wide degree of theorizing including; the episteme & techne of Aristotle (Parry, 2014), Mumford's Technics and Civilization (Mumford, 1934**),** Gailbraith's – Veblen-inspired "Technostructure" (Galbraith, 1967) and, among others, the many planes of sociomateriality explained later in this discussion (Orlikowski, 2007; Leonardi, 2014). The relevancy of the social and material relationship is found in the findings of this study. The ISM extends both a sociocultural and material understanding of the relationship between structure, knowledge and communication as intricately intertwined. The promise of knowledge through integrative applications is contingent upon the materiality of communication devices and the social posture of virtual interlocutors.

The integration of technology has catalyzed unanticipated structures in the educational arena. Proactive Orientation is theorized by the RI/AA as an adaptation of teachers to the integration of technology through the management of resources. This active orientation was taken to identify and create new support and knowledge structures that can overcome the challenges of integration. Gao, Ge, Lang & Xu (2018) published findings in *Technological Forecasting and Social Change* that found this same proactive orientation in environments where stakeholders are aiming to improve entrepreneurialism. As with teacher response to technology, the proactive orientation to pressure was attenuated by the building of a network of relationships. The assembling of these structures was contingent on their potential success. Evans (2017)

similarly found that the use of professional development structures were able to produce increased self-efficacy in the classroom, that in turn, resulted in the increased use of consistent technology implementation in the learning environment.

Technology integration as a catalyst for supportive structures is critical to the understanding of the successful mechanisms that can promote student success, teacher support and increased stakeholder communication. However, the study findings are by no means exclusive. Wauters, Lievens & Valcke (2015) examined one such structural extension of technology implementation in their inquiry on the capacity of students in the K-2 age range to make legal decisions online and how their rights can be protected as a result of their social media use. Thus, several factors may be in flux as structure is changed. Nonetheless, the findings of this dissertation apprise researchers and practitioners to consider the structural ramifications of technological deployments in order to maximize their intentionality, outcomes, and unintended consequences.

Modification of (stakeholder) Communication and Integration of Technology

Results from this study constitute a pattern of modification to communication resulting from the integration of technology. These modifications are manifest in this study as alterations to the content that teachers communicate as well as the form through which messages are communicated. The theme of *relational mediation* includes teachers emulating the language and technical preferences of students in order to increase their relatability to technology integration. Through *proactive orientation* teachers seek to form a shared group identity when they come together and accommodate each other through *cohort collaboration*. Finally, the modifications of channel/form in both the convergence of access and diffusion of channels in the ISM, is seen where multiple stakeholders converge on one point of access through an integrating application

and then see their messages diffused over multiple channels of distribution via user groups and social media.

As evidenced in the results of this study, the integration of communication technologies influence interpersonal communication, the group level of communication, and can also be observed through convergence and diffusion. This pattern of communication is characterized as "modified" rather than "accommodated" in this discussion because these alterations include interpersonal and intergroup accommodations, but they also reflect modifications to the means/channels through which these communications can occur. To understand accommodations occurring at the interpersonal and intergroup level, Giles (1979) Communication Accommodation Theory (CAT) is useful. CAT proposes that individuals make accommodations to one another's patterns of speech and motivations in order to achieve a synchronized communication (Giles, 1979). The application of mediated communication to this equation can additively alter contexts spoken, while still upholding the interpersonal nature of accommodation, as supported in the application of CAT in online communities (Hordila – Vatamanescu, E. & Pana, A.D., 2010). As CAT is extended into the online and new/mobile media environments, technological deployments and integrations, its application can elucidate research into these phenomena.

Findings of this study exemplify the premise that as individuals encounter each other through mediated communication, they will accommodate their message content and modify their communication contexts. This can be seen in the manner that testing has altered the content of messages. As technological apparatus are ensconced, limitations to the content are increased. Additionally, the pressure to conform to norms of technically bound forms of pedagogy are found in the participant testimonies of generational tensions to integrate technology into

classroom practice**.** In Katz (2002) *Machines that Become Us*, the author explores the modifications to communication that occur across forms of communication. As technology is integrated in our cultural institutions, we are modifying our patterns of interaction in order comprehend the change that accompanies their deployment. RI/AA exemplifies this phenomenon and offers an additional point of access to the Katz (2002) inquiry. The modification of communication patterns from the tri-linear model to the ISM model supports the manner in which the number of messages, their richness and ability to replicate through additional channels all support this premise. Historical debates over the constructivist and determinist views on the impact of technologies to our interaction continue until today (Ellul, 1964; Innis:1951; Lievrouw & Livingstone, 2006; Meyrowitz, J., 1986). However, the point of agreement between these views is that as technical transitions occur, the result will be a modification in the way we communicate. The outcome of this study will continue to advance this discourse.

The integration of technology is converging interlocutors as the mediation of messages is diffusing the temporal and virtual loci of the individual. Madianou (2012) explores polymedia as a means to explain the modifications that integrations of technology implore. Polymedia posits that individuals are now normatively conceiving of messages and channels simultaneously. The result of RQ#1 found that teachers made adjustments to their instructional communication by selecting apps and communication channels that engaged students, and were premised as the primary means of anticipating and attaining learning objectives. Accordingly, as teachers selected methods to communicate with parents, they expressed the seeking out of an "etiquette" through which messages are clarified. These results support and extend the polymedia premise and offer a way forward to research on polymedia effects in education (Madianou, 2012). A final modification of communication that technology integration engenders is the convergence of

media tools and sites where communication occurs between interlocutors. Convergence of media channels are present in the study results, where the choice of integrative applications consolidate communication, and where the ISM model is contingent on members joining a proprietary application. These findings are in concert with convergence research that posits new/mobile media hastening the coalescence of media tools and resources (Jenkins, 2008).

The integration of technology has the power to change our communication patterns and to converge channels and forms of media. CAT has provided one starting point from which these accommodations and modifications can be understood. Yet, the ability of technology integration to converge and diffuse forms of communication has not been adequately explored in instructional communication/education communication contexts. The significance of the outcomes of this study are relevant to the timing, degree of penetration and pedagogic strategies of technology implementation. Thus, the pattern of convergence and rate and level of diffusion should be considered when systemic integrations of technology are implemented in organizations or institutions, be they educational or otherwise. The integration of technology has produced findings that reveal a catalyzing effect on structure, and a modification of communication message contexts. The final inclusive pattern derived from the findings of this study has broad implications to the conception of communication as theorized and practiced.

Integration of Technology and the (Re)Prioritization of Temporal Consciousness

Time is the conceptual thread that runs through the findings of this research. All three significant results from this study are provisional and dependent on the consideration of time. The findings of RQ#1 produced a conditionally affirmative result regarding the integration of communication in the classroom. Teachers discussed these benefits in terms of their "time-savings" and their "efficiency". Prior to integration, K-2 teachers described being

"overwhelmed" and burdened by a set of expectations that were difficult to execute because teachers did not have the required technical systems to deliver on these tasks. Once technology is integrated, it syncopates a discrete set of expectations within the technical capacity to deliver the desired outcomes. As was found, these technical integrations produced the ability of teachers to improve engagement, differentiate learning and improve assessment screening. Thus, the time/productivity tasks found to be addressed by technology in this study coincide with the educational priorities of achievement through standards and testing, which incidentally, are the efficient purpose of the educational institution. Incidentally, this study also found that technical integration failed to adequately deliver on -and/or has not been prioritized to deliver on - supporting teachers for the social development of students.

The finding of RQ#2, *Recursive Identity/Agency Adaptation*, purports to explain the adaptation of the K-2 teacher's identity maintenance and resource management. The primary driver that influences recursive adaptation is the lack of time that teachers report as a resource scarcity, and which exacerbates all other difficulties in resource management. This deficiency of time reserve is further taxed by the iterative change that integration affords - from the *efficiency gambit*, to reliability issues, to repetitive trainings. Teachers compensate by adapting through efforts of their own making - syncopating to the temporal expectations of their work and scaffolding their ability to achieve increasing demands. Thus, they create collaboration structures, training groups and diversify new ways to attain resources- all in an effort to pursue the elusive temporal balance.

Finally, the success of the ISM model (RQ#3) is premised on its ability to compress time from the tri-linear model and to reconceive of time under new normative conditions. This new "normal" is defined by teachers primarily in temporal terms - "instant", "time-saver" "right now"

and “all at once”. As findings from this study support, the integration of technology into organizations or systems (re)prioritizes the temporal order of the system and the consciousness of its members.

The connection between technology and time has a long history of scholarship. In *Time Wars*, Jeremy Rifkin (1988) suggests that time has become a commodity in an efficiency process. *Time Wars* begins with the paradox of the efficient modern culture, which despite the promised utopia of time management has wrought a dire scarcity of “tangential or discretionary” time (p. 19). Rifkin underscores the emergence of *quality-time* as a demarcation point where time becomes commodified because of its scarcity. Rifkin describes how scarcity hastens the quantization of relationship, and by extension, meaning-making. Research on K-2 teachers revealed that educational institutions are increasing their self-conception as efficiency organizations and increasingly placing their focus on academic standards and assessments. This shift is perhaps most felt in the K-2 classroom because the contemporary K-2 teacher is increasingly tasked to deliver on standards that are new to their experience, and as reported, technology integration affords teachers the assigned task of proving their own value in quantitative terms.

In, *Modern/Postmodern, Off the Beaten Path to Antimodernity* Kramer (1997) provides context to the temporal life-world of the contemporary teacher, “The goal is to get everything scheduled/prioritized according to Western time (production) and ordinated spatially (measured and recorded), to be put into its "quadrant" in an appointment book in order to achieve: (p. 197-198). Kramer elucidates the juggernaut of time, acting as a perpetual framing agent of value and efficiency. Kramer’s most noted theory, Dimensional Accrual and Disassociation (DAD), informs the findings of this study, that the integration of technology effectuates the

(re)prioritization of temporal consciousness. As Kramer's states, "As dimensions accrue, time expands, allowing for movement both as social mobility and intensifying exploration of physical reality. For the Modern, speed is of the essence, and many live in a constant sense of urgency" (Kramer, 2012, p. 146). This description finds its footing in the pleas of the participants, who are bound between a duty and passion for service, and a struggle to manage their time and resources that seem to never be enough, while they manage the demands of shifting social priorities and functional materiality. The consistent complaints of teachers in this study such as time limits on testing and the acrimony of some younger teachers toward older teachers found in the *generational/value tensions* and theme of *Cultural Discernment*, echo Kramer's (2012) commentary:

> In Modernity . . . old age, once a sign of wisdom, is feared. Even our examinations are timed, and we have eating contests put against the clock. How fast, not how beautifully, one can write/type is considered an important communication competence. Time and space are conflated by Moderns as light years, miles per hour, and so forth. (p. 146)

Kramer (2012) identifies the equivocation of speed and competence that is found in the integration of technology and that acts as the impalpable relation that (re)prioritizes our temporal consciousness from the sentience of our will to the malignity of its own agenda. The infusion of technique into the ecology of communication is neither additive nor reversible, and instead, it indiscriminately transforms the temporal structure of the communicative ecosystem. As Wajcman (2008) suggests, "social studies of technology offer a richer analysis of the reciprocal relationship between technological innovation and changing time practices (p.x). As technological integrations continue in educational and other environments, the influence of

technology on the reprioritization of time should be considered by application developers, educators and researchers.

Theoretical and Practical Implications of Findings

This discussion has provided three inclusive findings that provide a global view of the results of this research and offer paths forward toward further inquiry. The remainder of this discussion will examine the key research results and provide an explication of each, discuss their theoretical implications and offer practical applications. These findings include; (a) Recursive Identity/Agency Adaptation (RQ#2) (a-1) Identity Maintenance (a-2) Management of Resources (b) Discordant Educational Outcomes (RQ#1) and (c) Integrated Stakeholder Model (RQ#3).

Recursive Identity/Agency Adaptation – Theoretical & Practical Implications (RQ#2/#1)

The grounded theory of Recursive Identity/Agency Adaptation (RI/AA) is the most significant finding of this study and dissertation. This theory answers research question #2. RQ#2 asked what impact the integration of technology was having on the process of K-2 teachers and teaching. Findings presented that early educators iteratively adjusted the management of their resources and amended their organizational practices as a result of technology integration. The integration also influenced their motivation and identity. RI/AA makes reference to structuration by utilizing the language of Giddens' (1991a) seminal theory. However, as is the case with grounded theory and with this study, coding relationships and abstractions avoid external theorizing. That being said, it was plainly clear that participants were creating and iteratively participating in social structures in order to adapt to the technical transition they had been placed in. Thus, the term "recursive" and other language is borrowed

from structuration as the results and attendant theory of RI/AA is formalized. The RI/AA was formulated through grounded theory methodology that garnered 28 interviews, 25 elicited texts and open, focused and selective coding that produced the grounded theory of RI/AA.

RI/AA provides a snapshot of structuration and adaptation in operation. As teachers respond to the integration of technology, they are overtly creating social structures that they directly attribute to technology integration. In addition, teachers are discussing their frustrations with the changing nature of the resources made available to them and the iterative nature of having to responding to this process of integration. Taken together, these conditions describe the function of structuration in situ. Thus, the mechanisms that are theorized are visible to see, and they are functioning as proposed in Giddens' (1991a) account. RI/AA is a grounded theory that extends structuration and provides a working model of the theory of Structuration in a specific social context.

RI/AA theory provides direct insight into the "rules and resources" that form the foundation of Giddens' theory and the "recursivity" that Giddens proposes as the most recognizable aspects of the theory. In Giddens' structuration theory, "recursivity" acts as the mechanism that provides the dualistic relationship between agency and structure. Giddens underscores what he calls the *duality of structure:*

> The concept of structuration involves that of the duality of structure, which relates to the fundamentally recursive character of social life, and expresses the mutual dependence of structure and agency. (Giddens, 1979, p. 69)

It is this "recursive character" that K-2 teachers are adapting to and are presuming to continue to adapt to, that makes structuration so significant to the understanding of the underlying studied phenomena. Giddens explains, "by the duality of structure, I mean that the structural properties

of social systems are both the medium and the outcome of the practices that constitute those systems (Giddens, 1979, p. 55). Therefore, inputs and outputs that generate the structural properties of outcomes, or extant structure, become the medium of action that agents act upon in order to adapt. This duality describes the feedback loop of the discordant educational outcomes that is proposed in RI/AA.

The theorized feedback loop in the RI/AA accounts for the action of recursivity in the social system of the teachers and theorizes that discordant educational outcomes from teaching feeds back into recursive adaption. It should be made clear that there are likely additional feedback loops to be discovered, examined and studied. However, only one loop was studied due to the nature of the research questions that guided this inquiry. The sustained transition of technology integration in this study is unique in that it is perceived by the participants to be ongoing and expected to last for some time. Because there is a condition of sustained change, this setting offers the opportunity for subsequent study and a longitudinal approach to this problematic. In addition, this condition provides opportunities for structurational approaches to research and examining teacher participation through organizational communication and organizational studies.

Giddens (1991a) has been utilized to explain RI/AA as a result of the exploratory nature of this study, and the foundational theory of structuration has experient fit with the grounded theory. It should be distinguished that RI/AA is *not* a structurational model itself- it is the model that was found in the data which closely resembled structurational theory (Gidens, 1991a), which will be further explored. Nonetheless, other conceptualizations of structuration should not be ignored as they offer unique perspectives that can open up the grounded RI/AA theory onto additional analysis and research. Among these theories are Adaptive Structuration Theory

(Poole & Decantis, 1990), which will be further explicated in the analysis of management of resources, and Orlikowski's (2000) practice-lens as well as her early examination of structure and the "duality of technology" (1992). Orlikowski's work in structuration is foundational to socio-materiality, which is discussed as a theoretical implication of the Interdependent Stakeholder Model, or ISM later in this discussion.

Hasse (2017) examined results from the Danish government study that investigated the integration of technology and its impact on teachers. The study found remarkably similar results to this inquiry, though Hasse (2017) did not incorporate structuration into her analyses or the theory of the data. Hasse (2017) found that:

> Teachers were not simply in need of knowledge about how to manage technical challenges, they would also benefit from awareness of how new technologies change relations, identities, and complex power structures and . . . . explicitly addresses this issue of the new skills and analytic capabilities that teachers need in order to engage effectively with technological development. (p. 365)

The results from the Danish study are supported by the RI/AA theory and in particular, the emphasis on power structures, relationships and identities provide a confirmation of the relevancy of the challenges that teachers experience and bolster the premises of the RI/AA theory.

RI/AA is the central finding of this study. It answers the second research question, while RQ#1 operates as the feedback recursivity loop for the theory. RQ#3 did not provide sufficient evidence to be incorporated into the theory, but stands on its own as a significant finding and could potentially function as an additional feedback loop with further evidence. Taken together the results provide a depth of understanding into the opportunities and issues that K-2 teachers

encounter when the integration of technology deploys new/mobile media into their instructional communication.

Theoretical Implications

RI/AA is intrinsically connected to Giddens' structuration (1991a). As discussed, there are other theoretical groundings and considerations that RI/AA that can be applied to and potentially extend. Poole (2013) explains that Adaptive Structuration Theory (AST) is specifically geared to explain how technology, "group and organizational processes and outcomes depend on the structures incorporated in the technology and on the structures that emerge as users attempt to appropriate the technology to adapt it to the tasks at hand" (p. 609). AST provides a specific and supremely relevant path for further research and understanding of the phenomena of study. This will be further explicated in the section on Management of Resources. AST is of particular use in the examination of technology as a resource and the manner in which it influences roles in organizations. RI/AA was generated from gathering data from K-2 teachers in suburban schools that function in small groups of teachers in a bounded organization. The application of AST could shed light on the mechanisms through which the structuration in RI/AA occurs and how individual technologies/applications function to foster these changes.

A final promising line of research that can serve to advance this inquiry can be found in Silva and Sias (2010). Silva and Sias examined structures and construction of relationships in organizations. Their research looked at how individuals with multiple co-culture in-groups were able to connect to the group without having external conflicts. This research could be of particular use in connecting the Recursive Identity/Agency Adaptation and the Interdependent Stakeholder Model to provide a fully integrated model of technology integration in instructional

organizations. The results of this study found considerable conflict between generations as a result of the integration of technology, and also found that integration can create confusion and redundancy as evidenced by the productivity continuum. The examination of the factors found in Silva and Sias (2010) can shed light on the how integration in schools can occur, while reducing the conflicts that can accompany the transition.

Practical Implications

RI/AA offers several avenues for practical application for teachers, and those in educational hierarchy. In addition, there are applications for organizational communication and organizational change professionals. Finally, there are applications from RI/AA that can be useful for counselors, mental health professionals, HR managers and those who work to support teachers in their professional capacities.

In the education sector, district-level personnel can examine RI/AA and foster feedback mechanisms for teachers so they can more readily respond to resource needs. As planners and decision-makers consider technology integration, they can use the knowledge of RI/AA in order to consider staging integration so training and collaboration structures can lead, rather than lag, integration practices. School principals and managers can incorporate mentoring programs that can support teachers that struggle with transition and can offer proactive training for those that struggle with specific implementation challenges. Best practices for integration can be identified and duplicated across the system. The ramifications of RI/AA can be incorporated into organizational applications outside of education. Where technology is being incorporated, managers can anticipate and diffuse identity or skills obsolescence prior to implementation, and HR professionals can incorporate trainings and support into the transition to avoid lost

productivity. Finally, counselors and mental health professionals can examine and respond to identity issues.

Identity Maintenance - Theoretical & Practical Implications (RQ#2/RQ#1)

A key finding of this study recognizes that the integration of technology applies significant pressure on contemporary K-2 teachers who must adopt new skills, communicate in new ways and revise their instructional strategies. Adaptations occur simultaneously and with considerable magnitude and teachers report being overwhelmed and having difficulties managing their time. As the integration of technology increases, teachers evaluate external perceptions of teachers, the evolving student and the trajectory that their professions might take. Finally, self-appraisals denote generational and value tensions that were conveyed by all teacher participants. The characteristics of this divergence is found in a variance of technical skills, differentiated inclusion of technology in classroom practices, and in the chasm of attributions between "go – getters" and " dictators". These collective tensions accentuate the revision in identity that teachers are navigating: (a) internally as noted in theme *Self-Appraisal* and (b) externally as explicated in the *Cultural Discernment* theme. These themes addressed the Identity Maintenance that teachers recursively adapt to as they deal with the integration of technology.

The findings from this dissertation connect to Carter (2015), who examined how the use of information technologies had an effect on how, "people express, maintain, and expand their self-concepts" (p. 931). This feature of technologically mediated communication supports self-appraisal as an expected outcome of technology integration. Additionally, RI/AA offers an supplementary footing for Carter (2015), that noted, "As social roles and relationships become increasingly inseparable from people's interactions with information technologies (ITs), new

constructs representing this intertwinement are needed to expand understandings of human behavior", (Carter, 2015, p. 931). RI/AA offers one such construct to extend research and understandings of "IT Identity".

Generational tensions in the participants of this study indicate that K-2 teachers face contradictory understandings of the ideal teacher that are catalyzed by efforts to accommodate increasing expectations for the use of instructional technology. Younger teachers their older counterparts as intransigent and resent their tenure and lack of motivation. Older teachers point to their value-laden experience as a guide to tempering the introduction of technology in the classroom. Minei and Bisel (2012) inform the generational phenomenon teachers face. The researchers found that the introduction of technology and disputes over its use in a firehouse were differentiated by age and experience. As with the teacher cohorts from RI/AA, Minei and Bisel found that age differentiated positions were, "disqualifying each other's critiques—whether supported by personal experience or technical knowledge" (p. 17). Findings suggested that older firepersons were ignoring technical knowledge, "in a process we label epistemic denial"(p. 17). Epistemic denial offers a path forward for continued research on the integration of technology that examines how it may be, "functionally useful" to teachers "individual identities, while potentially harmful for the team's ability to learn" (Minei & Bisel, 2012, p. 17).

Identity research opens another pathway to inquiry that can incorporate a structurational approach to teachers self-appraisals and generational and value conflict. K-2 teachers have inordinately higher rates of parenthood, which may add additional pressures and factors to time and generational issues. Golden (2015) conducted structuration based research on the effect of information communication technologies (ICT's) on work-life technology use. This research found:

> Compelling evidence of recursive structuring in the enactment of technologically mediated work-life interrelationships across the work-life boundary. That is, participants' accounts of their practices show them drawing on both organizational and employee /family rules and resources in their recurrent engagement with ICTs.
>
> (Golden, 2013, p. 115)

Golden (2013) signals an extension and application of the RI/AA finding and provides a linkage to structuration and technology at work. The findings of this study indicated that professional cohorts were often premised on close interpersonal relationships and a shared sense of responsibility and family ties. The application of Golden (2013) to the results of the study provide a starting point for further investigation and research into how the introduction of IST's, new/mobile technologies and integrative applications are influencing the relationships and performance of teachers. This study found significant results that can be applied to Golden (2013), including proactive orientation and cultural discernment. By delving deeper into the manner in which teachers are drawing separately on rules and resources from the organization and interpersonal lives can provide a more comprehensive understanding of the phenomena and how integration might be undertaken.

Theoretical Implications

The themes of *Self-Appraisal* and *Cultural Discernment* represent the internalization of the self and the looking outward of individuals to foster identity. These themes closely resemble the impression management that Goffman (1956) proposes. Goffman suggests that as individuals interact they are managing their selves in a choreography of identity. Social Identity Theory (SIT)/ the social identity approach to identity offers another intersection between RI/AA and extant theory (Tajfel & Turner, 1979). RI/AA found that identity maintenance was a significant

and iterative occurrence for teachers that were experiencing the integration of new/mobile media. These results found that a variance between the satisfaction and participation of older and younger teachers. SIT suggests that as group identity is strengthened through the organization, that the individual will also strengthen their identity, increasing satisfaction. Accordingly, results from the study found that older teachers that embraced the transition to new/mobile technology wee among the most satisfied with their work relationships. Young teachers tended to exhibit an attitude of "go-getters, with higher levels of instructional technology application and higher degrees of neo-institutional ownership. Thus, SIT offers a potential point for further research on the conflict that arises due to generational discordance and a potential means of further understanding of how teachers maintain identity in response to the integration of technology (Tajfel & Turner, 1979).

A primary framing for RI/AA in the findings and discussion has been its conception as a theory of structuration. Among the three features of RI/AA, Identity Maintenance is posited to be carried out by agents who iteratively construct and reconstruct identity in order to come into alignment with role expectations that are brought about by the integration of technology. The connections between identity and structure direct theoretical inquiry to Identity Control Theory (Burke, 2007). Of particular interest is the "identity standard", or the expectation of what a particular identity is required to entail. It is in this iconic view of an identity standard- in say, a K-2 teacher in the digital classroom – that provides the point of reference that can set off generational disputes over how the standard might be enacted. The research undertaken produced an explanation of the process through which identity is maintained, but did not inquire into the depth of the criterion of the identities that manifest in response to the introduction of new/mobile technology. Through further examination, the identity standard in ICT can be

applied to RI/AA by grounding the identity maintenance occurring in the RI/AA model, as an act of identity control.

Practical Implications

Teacher identity is a critical factor in the understanding of the RI/AA and the findings of this study more generally. Identity Maintenance and issues of self that arise through technical transitions are of particular concern for employers and HR managers, and organizational change professionals. In order to seek productivity and care of group/organization members, these professionals can use the knowledge of RIAA to equitably scaffold identity pressures through co-mentoring and targeted training that identifies technical skill deficiencies and preemptively diffuses them. These efforts will need to be intentional in that diffusion of skill deficiency and identity conflict must lead, and not lag, integration of technology.

Resource Management - Theoretical & Practical Implications (RQ#2/#1)

The management of resources acts as the central apparatus through which teachers encounter and recursively adapt to resources in their workplaces. As teachers encounter unstable flow, quality or applicability of resources, they must erect their own support structures to compensate. RI/AA theorizes the process through which teachers adapt to the integration of technology and act individually and collectively through collaboration, peer-to-peer training, building relationships and seeking out new mechanisms of support. Through these processes, teachers utilize group and organizational communication practices to achieve their goals.

The management of resources and communication systems act as tools to the organization, groups, and individuals that perform as continuous agents of action (Orlikowski & Scott, 2008). Teachers in the study exhibited a flexibility of work and communication forms as

they shifted from the island of the classroom, the dyadic collaboration with their teaching partner and to the expanse of the mediated messages in the Interdependent Stakeholder Model. However, at the center of the resource adaptations that teacher's utilize in the RI/AA is collaboration.

RI/AA Groundings and Theoretical implications

Keyton, Ford, & Smith (2008), proffer a *Mesolevel Communicative Model of Communication* to explicate and theorize collaborative acts as the productivity/resource nexus that lies between the individual actor and the group/organizational understanding of communication. This research provides further insight into how collaboration is structured by individuals to buttress a response to technology integration. The results of the research highlight collaboration in all three of its major finings where a rejoinder to integration is found: (a) students collaboration as output of integration-RQ#1 (b) the collaboration of teachers as an adaptation to integration – RQ#2 and (c) as an outcome/benefit of the integrative applications in the ISM. It would seem that where organizations are found, collaboration is either near, or needed. Keyton, Ford, & Smith (2008), explain that mesolevel collaboration, "is no longer described as one of the component(s) of collaboration; communication is elevated to the essence of collaboration" (p. 376).

Organizational and group level analyses of resource management in RI/AA are plentiful. Continuing on the structurational perspective, Poole, Siebold & McPhee, (1996) investigate the relationship with structuration and group- level decisions. This approach offers a new avenue from which to comprehend teacher response to integration as it maintains the theoretical underpinning of RI/AA. Other organizational avenues of research open areas that are not address or conceptualized by the research questions or RI/AA and provide insights to extend or expand the theory.

Teacher adaptations are theorized as iterative actions of self-support that address resource and identity needs. RI/AA is squarely grounded in the data collected, but does not claim to exclusively explain the actions of teachers encountering the integration of technology. Structurational approaches can provide instrumental models that lack human motivation. As structure is subsumed in agency, the motivation of the individual can also be subsumed, and as Kort & Gharbi (2013) explain structuration can "conflate structure and agency". Thus, the inclusion of other motivations can serve to buttress the theory. In Kramer, Lee & Guo (2018), uncertainty provides a potential motivational factor through an approach that also accounts for assimilation and exit of group members, which is only tangentially addressed by RI/AA. Uncertainty provides a motivational dimension to the use of technology and offers an additional line of inquiry for teacher/technology research (Kramer, Lee & Guo, 2018). Uncertainty can be viewed through an information processing approach to support RI/AA.

A final source of research that can be useful to the discussion of RI/AA is found in DiMaggio & Powell (1983) and their oft-cited, *The Iron Cage: Institutional Isomorphism and Collective Rationality in Organizational Fields*. This article posited that organizations are isomorphically attracted to sameness and homogeneous trends. The authors suggest that coercive, memetic and normative isomorphism influence organizations and the structures that support them, and tend to assimilate to one another. The researchers explain that individuals are being professionalized into an interchangeable thing-ness as systemic assimilation occurs. These concerns echo in the identity maintenance and resource management that are brought to bear on K-2 teachers. Generational tensions, feelings of being overwhelmed, shifts in time consciousness and disassociation are bourn-out from the data, and suggest that as approaches to the grounding

and extension of RI/AA and study results are examined, the inclusion of a cultural and metaphysical lens be explored.

A final theoretical grounding to RI/AA Resource Management is perhaps the most directly implicated by the nature of this inquiry of integration of technology in organizations/institutions. Adaptive Structuration Theory (AST) is a modification of Giddens' (1979) theory that has been modified to specifically address technology in groups and organizations (Poole, 2013). AST is concerned with the way that technologies are implemented and utilized in groups and organizations and examines the outcomes of those implementations and utilizations in the context of structures. The management of resources in RI/AA hinge on the integration of technology as directed by hierarchical powers that teachers must work under, and where the adaptations that teachers incorporate are primarily relational. This distinction is represented in AST by the separation between, "Structural features are specific rules and resources that are embodied in the material ICT artifact, while spirit is the general intent with regard to values and goals underlying a given set of structural features" (Poole, 2013. p. 609). The application of AST in RI/AA has promise to deepen the understanding of the relationship between the technology and the agency of structure assemblances of teachers. Lastly, AST can help to delineate what effects of integration can be accounted for from technique, and what aspects pre-exist integration.

Practical Implications – Resource Management

The adaptation to resources as represented in the RI/AA provides critical information to those in the managerial hierarchy of teachers. This study uncovers the benefits, challenges, frustrations, and opportunities that are triggered by the integration of technology. Though geographically bound, administrators can examine what support structures are being utilized and

what structures are used by default rather than preference. HR professionals and administrators can gain a sense of the personal ramifications of policy and make adjustments where possible and needed. Teachers can gain a sense of all the assets available to them in order to scaffold additional support structures, and learn from other teacher's experiences. Teachers can also take away a sense of the Other in the generational divisions that are present and become aware of their own postures. Meanwhile, non-education based organizations that are planning to integrate technological systems can anticipate skill differentiation and extend training and support designed to limit productivity loss, decline in morale and potential factions forming from the "haves" and "have not's" of technical identity.

Discordant Educational Outcomes -Theoretical & Practical Implications (RQ#1)

K-2 teachers in this study evaluated the integration of technology in their classrooms and the manner in which these instructional strategies promoted and supported the attainment of desired learning objectives. Initial questions of each interview identified that desired learning objectives included the "whole person" and the "academic, social and emotional" development of their students. As a result, the findings indicate a discordant set of responses. These will be addressed individually. First, the implications of positive perceptions reported in the study, *Engaged Differentiation*, will be discussed and theoretical implications explored. Second, the *Social Development Delay* findings and the significance of this discordance will be addressed, and the theoretical implications of the discordant findings will be examined.

The results of this study indicated that teachers find the value of the integration of technology to be important to their ability to successfully attain their academic learning objectives. K-2 teachers utilizing new/mobile media and technology found that it was critical to

engaging students, allowing for the differentiation of skills and interventions for students and in the real time assessment of students through screeners that provide evaluation. These results directly answer research question #1 and provide insight into the pedagogical value of technology integration. These results accord with and extend extant research on the academic value of implementation of technology.

Proctor (2013) found that there was a strong perception of ease of use and usefulness of technology in the classroom over time. The current study supports the trend of Proctor (2013) and suggests that there has been a further increase in the perception of the use games value to teaching. The application of technology in the elementary learning environment has been found to be most successful when teachers were intentional and avoided the one size fits all mentality (McFarlane, 2014). This research found that teachers implemented technology intentionally through their pedagogic strategies. Teachers in this study utilized technology to differentiate learning and individualize learning needs for their students. Gamification was found to be a significant trend in this study and research. This trend supports both implementation and research trends and can be applied to the Kasurinen & Knutas (2018) meta-study that reports increasing interest in gamification as a proof-of-concept for learning through the integration of new/mobile technology and media.

Theoretical Implication – Discordant Educational Outcomes (Positive perceptions)

Teachers reported interest is two theories that can support and model best practices for the implementation of technology for learning. In addition, TPACK + theory will be revisited and extended with the knowledge and results from this study.

Transformative Learning Theory posits that students can expand their knowledge base through exploration of the possible rather than through a cycling of banked cultural knowledge

(Mezirow, 1991; Taylor, 2017). Teachers in this study were explicit regarding their goals for teaching through expansion of concepts and incorporation of a broad range of experiential learning practices. The incorporation of technology was reported to provide a mediated ability to supplement and expand these experiences and scaffold learning. Taylor (2017) describes the characteristics of transformative learning practices as, "interested in complex and prolonged learning processes in which individuals reconstruct their interpretations of their experiences and develop a critical perspective on knowledge" (p.1). The approach that Taylor outlines is one form of inquiry that teachers reported as enabled through integration of technology- the uncovering and supplementation of imagery and media that provides additional information and perspective to learners.

Several teachers explicitly referenced the SAMR model of technology integration in their reports of their integration strategies and how they approached the successful integration of technology. The SAMR model stands for the substitution-augmentation- modification-redefinition of technology integration in learning environments, with each step a further move to deeper and more valuable learning (Romrell, Kidder & Wood, 2014). The SAMR theory states that technology integration does not advance additional learning when it is simply substituted for an analog practice, but gains additional educational value when it provides additional learning opportunities and acts as an improved process for teachers. Teachers in this study discussed the SAMR model as a pathway to understanding where pedagogical value in technology integration may exist or alternately, where teachers would continue analog teaching strategies. (Romrell, Kidder & Wood, 2014). The further examination of applied theory to pedagogy and integration offers direct insight into the motivations of teachers learning objectives and cuts to the center of the examination of the integration of technology.

Technology Pedagogical Content Knowledge (TPACK) describes a set of practices for the integration of technology in educational settings (Steckel, Shinas, & Verenewyck, 2015). Working from Shulman's (1986) content knowledge basis, TPACK,

> Describes the nuanced relationship between three discrete types of knowledge: technological knowledge, pedagogical knowledge, and content knowledge. These combine to form additional domains of practitioner knowledge: technological pedagogical knowledge (TPK), technological content knowledge (TCK), pedagogical content knowledge (PCK), and TPACK. The TPACK framework provided us with a lens through which to consider the practice of exemplary technology users. (p. 43)

Additional inquiry into the epistemic groundings of technology integration in relation to the sustainability of pedagogic values and practices are of vital importance to the understanding of teacher's legitimation of technology use. RI/AA offers a view of the adaptation that teachers are experiencing as a result of technological transitions. TPACK offers a more nuanced examination of why teachers make the evaluations that they do (RQ#1), and in what ways process alterations are relevant to the delivery of knowledge in the learning environment. Findings from this study support that these three forms of knowledge offer insight into both the variance of proclivity to teacher integration preferences, and the integration practices. These mechanisms are not well understood in the study and TPACK offers a framework from which to extend the knowledge gained from this study and analysis.

Discordant Educational Outcomes (Negative perceptions)

Grounded theory methodology is premised on the inductive process of abstracting knowledge from data. As a result, Glaser & Strauss (1967), initial inception of grounded theory

forbade any assumptions, literature or theorizing in order to isolate the data as the only source of theory that is produced by being grounded in data. In this mode of thinking, no results from a grounded theory can be thought of as unexpected. As grounded theory developed, later interpretations (no pun intended) of grounded theory made the ontological and epistemic case for the inclusion of literature and even theory as a framing for study (Corbin & Strauss, 1990; Charmaz, 2000; Charmaz, 2006). Even considering this research context, the consistent findings of *Social and Developmental Delay* by K-2 teachers was surprising in their degree and reports of dissemination throughout geographical and socio-economic factors. Furthermore, The finding that framed the use of technology by children as a contributing factor to these social delays can be described ranging from concomitant to causal. This last finding, despite the discipline of grounded theory methodology must be described as unexpected.

The results have explicated the difficulties with attention and behavioral social issues and with problem solving and critical thinking in related cognitive delays. Two critical factors were offered by teachers; (a) a lack of parental intentionality or care, and (b) a high rate of trauma in the State the study is located in. It should be made clear at this point that this study makes no empirical nor definitive findings about these reported deficiencies. However, it very much concerns itself with the evaluations of teachers and the influence of these perceptions of the integration of technology on their teaching practices.

Teachers noted concerns over screen-time that are echoed in Stauff (2016), who uncovers that the screen and teaching are overlapping in ways that are becoming indiscernible. It is significant to mention that the ISM model is premised on the successful "mediation" of both relationships and the ecology of the school and the classroom. Thus, integration is itself a mediation that is normalized as teachers find in their expectation of ongoing change and

technical transition, even perpetually. The manner in which technology is having an effect on the students cannot be examined here, and claims such as Carr (2010) and neuroplasticity implications cannot be derived from teacher accounts. However, the intellectual knowledge of the teacher that is rooted in their practical experience with students cannot be discounted.

Teachers that were actively pro-tech integration would describe the social problem in terms of addressing balance between technology and analog practices. Those teachers that were proactively concerned with addressing social issues through pedagogic practices suggested that in addition to balancing the time spent between approaches that a regression to former practices of unstructured exploration and play be considered. These teachers were concerned with fostering "kid-ness" and "play and imagination" as their goals. These sentiments are posited as fundamental in Paley (1992), who organizes learning around play in the Kindergarten and early education environment. Further research making inquiry into teacher evaluations of technology integration should consider proposed best practices for countering social delay, or where in fact the responsibility and response to this critical concern should originate.

Theoretical Implication – Discordant Educational Outcomes (Negative perceptions)

Teachers identify their desired outcomes in the classroom to be holistic and can be described as teaching the whole persons needs: socially, mentally, and physically. Reported outcomes do not deliver on early educators goals. In fact, teacher perceptions of the contemporary students and social development are discordant with their ideal of holistic education. Teachers do not explicitly connect social development delay as a failure of educational learning goals, but strongly identify it with three external factors: the use/abuse of

technology and media, parental attention and control over media, and to a lesser degree-high levels of trauma in the State.

Additional research is required to account for the discrepancy and ramifications of discordance. However, a discussion and cultural analysis of the macro effects of technology may elucidate these findings. Technology can be seen from the field as a leveler of outcomes to their most central effects, or as Jean-Francois Lyotard (1979) notes, "technology pertains not to the true, the just or the aesthetic" but is only measured by efficiency (p. 44). In the case of the participants of this study, the efficient outcomes of the integration of technology are the academic improvements for students. Engagement with the subject matter, improved outcomes for more students through differentiation and the compression of time considerations are of central concern to the efficiencies of institutional education.

Technology integration is examined at the organizational level of analysis in this study. At the epochal level of analysis, the integration of technology has become a normalized feature of culture and the "blossoming of techniques and technology" is the stuff of our meta-narrative and marks a shift from the organization of culture to produce outcomes, to a culture that produces processes (Lyotard, 1979, p.37). As Lyotard (1979) states, we live in a place where the priority has moved, "from the ends of action to its means" (p. 37). Teachers may hold the ideal of educating the whole person, but as the gaze shifts from the relational to the technical, there are consequences. Kenneth Gergen (1990) describes that as technology holds great promise, it also is a mechanism of "amoralizing" in a culture (p. xvii). As the efficient pervades motivation, the individual has difficulty navigating, "issues of expression and control…and morality" (p. xvii).

Educational institutions progress toward reducing social control. Though the function of age is undeniable here, the responsibility for the individual's social and mental health is lessened

with each subsequent graduation, until there is a wall of legality separating the teacher in higher education from addressing the social student entirely. Standards are increasing with the outcomes of rising grade level achievement, and the reduction of social care as a systemic priority must be considered. As the focus of education follows the trajectory of technique, the prioritization becomes the "efficient cause of human actions . . . and eliminates as secondary everything that expresses human personality" (Ellul, 1964, p. 330). The effect of efficiency is something that is done *to* teachers- it does not come *from* them. Teachers in this study report being disconnected from their past roles and the transition to the facilitator of curriculum, testing and standards. If not tempered, Ellul (1964) warns that the influence of the integration of technology, "makes [them] into a *thing* and puts [them] where they are most desirable . . .where they are most efficient" (p. 362).

Interdependent Stakeholder Model (RQ#3) -Theoretical & Practical Implications

Research question #3 addressed the impact of the integration of technology on the teacher-student-parent relationship. The results of this study produced a theoretical code that accounted for the ecology of media and technology on this relationship from the perspective of the teacher and proposed a model of interdependent communication. The interdependent stakeholder model accounts for the effect of integrating technologies on the relationships between the three critical classroom stakeholders. The results of this model in action as reported by K-2 teachers, promote richer communication, advance communication competency and foster accountability in communication patterns, while it simultaneous increased student engagement, and performance. Most critically, the new model dramatically improves parent participation, messaging, volunteering and student-teacher-parent triangulation.

This model of communication extends the research of Olmstead (2013) that examined the positive effect of technology on parent involvement. The ISM also answers, in part, the researchers call for additional research on parent involvement as technologies evolve (Olmstead, 2013). Olmstead (2013) and the ISM model extend research on parent involvement and offer promise for future inquiry. These results were conditioned by the results of McClain (2015) that found parent involvement has financial means as a pre-requisite, and which found that technology did not promote parent involvement. However, these differences are accounted for by two factors; (a) suburban schools being chosen as the site of this study based on a higher relative rate of technology integration and (b) patterns of technology use in those lower socio-economic status have been altered over the last several years, allowing for limited access and reduced access gap. However, the lack of reliability, compatibility issues and obsolescence have sustained the importance of equity issues for parent involvement and student home access (Pew, 2018). The benefits of the use of integrating technologies and the ISM have the potential to widen the SES divide and must be addressed by developers, individual schools and districts.

The importance of parental involvement is not in dispute by participant teachers or extant research. Black (2014) found that the impact of parents authentic engagement as critical to student success. Accordingly, the ISM models greater inclusion of students and parents, transparency of student activity, and richer content of discussion between parents and students about school activities, relationships and assignments. These results should be confirmed by further research that examines participant parents, participant students and analysis of the richness of discussions between students and parents. In addition, as Kildare (2017) found, the increased use of devices by parents can reduce the quality of parent-student face-to-face

communication. Thus, the results of the ISM should be examined in relation to the potential mitigating factors of Kildare's (2017) findings.

Theoretical Implications- Interdependent Stakeholder Model

Participant teachers reported that a condition of the benefits of integrating applications is the participation of parents in the application/network that structures communication and diffuses messages into various groups and publics. Additional research is required in order to determine why stakeholders select the integrative technologies and tools and abandon or supplement their current tri-linear means of communication. The application of Uses and Gratifications theory to this research problematic offers a means to identify the motivations for use of technology in the most salient stakeholder in the ISM model, the parent (Blumler, 1979). Tae-Sik (2012) incorporated Uses and Gratification in his study of Korean sojourners and found that participants will assimilate to a culture if participants made intentional media choices that supported their needs and values. As is the case with ISM, the Uses and Gratification approach can be applied in educational settings where technology is deployed. Reychav & Wu, 2014 found that information needs and user preferences had a significant effect on the use of new/mobile media in educational environments and this outcome can be applied to additional ISM research.

The ISM has been found to generate productive results administrators and teachers are likely to desire to replicate. From the policy standpoint, it is critical for administrators to identify how parents can be motivated to participate in integrative technologies. Uses and Gratifications research can help identify how parent's motivations can be understood and then leveraged to increase parent participation, student achievement and synergize stakeholder communication.

ISM and integrative technologies are dependent on the use of smartphone and tablet devices to open the social pathways that can compress time and enrich communication through

multiple forms of media and messages. These material prerequisites to the success of the social benefits found in ISM indicate the fusion of the social and the material. Sociomateriality challenges the, "deeply taken-for-granted assumptions" that technology is a social undertaking (Orlikowski & Scott, 2008, p.434). It is this concomitant enabling between the material and the social, the I-pad and the chat room, that brings about the anticipated result of participation in mediated communication.

Sociomateriality is described as "extremely theoretical" by Leonardi (2013) who explains:

> . . .the materiality of a particular object – the ways its physical or digital materials were arranged into particular forms that endured across changes in place and time – could be seen to shape technology use patterns for users themselves, and for the groups and organizations in which they worked. (p. 62)

The ISM model echoes Leonardi (2013), where parents and students agree to participate in classroom practices afforded by the integrative technology, and then do so through the use of their devices, and done with the promise of shaping and extending use patterns themselves.

The theory of sociomateriality can be applied to research in elementary settings as found in Clark/Keefe & Kaines's (2017) study, as well as examining technology use Carlson & Sundin (2017). If, as Orlikowski (2007) claims, "that the social and the material are considered to be inextricably related", then the application of sociomaterially grounded research to communication phenomena that are explicitly materially and socially interdependent such as the ISM, will be both relevant and penetrating (p. 1437).

Communication occurs in the ISM by, through, and with, multiple stakeholders at the teacher-student-parent level, the school-wide level, and the district-wide level through a diffusion of networks. Teachers reported the use of supplementary networks from integrated

application use including user groups and social media feeds. The examination of networks found in integrative technology participation, the manner in which these networks are formed, and their significance to the sustainability and growth of parent participation, opens useful avenues for subsequent inquiry through Network Analysis. Lee & Katz (2015) research on immigrants based in the United States examined: (a) the ability of ICT's to expand existing networks and (b) how the use of certain technologies influenced the insularity of in-groups. The findings of Lee and Katz (2015) included differentiating the use of technology in networks with strong ties and weak ties. The use of integrative applications in the ISM model represents the introduction of information communication technology (ICT's) into the strong ties relationships found in the traditional tri-linear model, and the subsequent diffusion of messages to relational weak ties. Lee & Katz (2015) network approach offers further examination and understanding of assimilation in a technology-based network that simultaneously strengthens intimate relationships, while diffusing them into wider networks.

Practical Implications - Interdependent Stakeholder Model

The practical implications of the ISM can be directly applied to K-12 schools that seek to promote the participation of parents, and to engage students and improve their scholarship. As schools become a more competitive marketplace, they are increasingly seeking to promote their "product". Teacher responses noted that schools use the integrative technologies and social media as an advertising and public relations platform. In addition, schools have long been confused and troubled by the historical decline of participation of parents. This phenomena described by ISM is viewed as a success story by administrators who are pressuring teachers to incorporate them at higher rates. This pressure exacerbates the time constraints of teachers, and also asks teachers to become promoters of product that may benefit from training in order to

increase their success in these tasks. Finally, researchers can provide critical information on the efficacy of these programs to application developers, who seek to improve or create new software and integrative applications.

Limitations

Every research project makes choices that limit their scope and effect, and every study has inherent limitations that stem from their design and ontological underpinnings. This research is no exception. Though participants to this study are recruited based on specific criteria, the use of a purposive sample - recruited through email- gives the opportunity for self-selection effects. This study reduced these effects by developing specific criteria for inclusion and also accepting variance as an outcome of the study. Self-reporting is a limitation of all interview –based research. However, grounded and intentional approaches utilize methods of data collection and analysis that abstract beyond the surface of the self-report and uncover patterns of behavior and structure that provide information difficult to through other methodologies.

The choice of suburban schools afforded a cohesive view of the phenomena across a significant geographic region. This sampling criterion also acts as a limit to the data and the representation of teachers. As discussed, this exploratory study sought a cohesive and mature view of technology integration that could be found in suburban schools. Subsequent study will pursue the experience of urban and rural teachers. Finally, the lack of generalizability in qualitative research has been a criticism of the approach. Instead, qualitative approaches offer a transferability of findings into social contexts that are similar in nature and conditions. As noted, the validity measures of this study, found in the Methods section of this document, exhibit great care to insure validity in the approach of this research. Lincoln & Guba (1985) note that "It is, in summary, not the naturalist's task to provide an index of transferability, it is his or her

responsibility to provide the data base that makes transferability judgments possible on the part of potential appliers." (p. 316). To this end, this document's findings provide rich, thick and prolific support from the data in order to report the grounded results of this study.

Recommendations for Further Study

This recommendation section begins with research that addresses the inclusive findings of this study, then examines the three main findings from data that relate to the three research questions. This research is self-characterized as exploratory in nature and sought to identify the qualitative impact of technology integration on teacher evaluations, processes and relationships. This approach has been taken because of the increased penetration of new/mobile technology and media into the K-2 classroom over the past several years. This research is being conducted at a time where participants have experienced the phenomena over a period that is appropriate enough for them to examine the phenomena and offer reflective analysis.

The next step in examining this phenomenon will be to produce similar research in both rural and urban school districts. These separate studies will be able to confirm the findings of this study and/or differentiate them, while providing a greater picture of the area of study. This researcher will be executing these studies subsequent to the completion of this dissertation. Due to the relationships built over the course of the three tiered data collection in this study, and due to the 100% opt-in for contacting participants for further study, the researcher intends to revisit participants every two years to evaluate differences in their perceptions and the manner in which the resources and identity management have been altered, and also to examine the relevance of these findings over time. This approach will provide a longitudinal research project that can provide a sustained view of the phenomena. Finally, Communication Accommodation Theory (CAT) was noted in this study supporting the interpersonal changes that occur with integration of

technology. The specific application of CAT to the electronic communications is ISM will extend extant research and uncover mechanism of change in the transition to integrative applications, which are ascendant in educational environments.

The evaluation of technology integration that teachers address in research question #1 produced discordant findings based on the participants desire to help advance the whole person. In order to further investigate these divergent results, the application of educational theory can provide deeper insight into the limitations and successes of technology integration. Some teachers that reported the highest levels of integration noted the SAMR model as a means of attaining intentional strategies. The further investigation of these strategies and other models in a comparative analysis would further highlight the importance of theoretical models for successful integration and potentially address the social delay discordance noted on RQ#1. Similarly, the TPACK model, that incorporates what is called artistic integration, can be further extended.

The second research question investigated the impact of the integration of technology on teachers and the process of teaching. The result of this inquiry is the grounded theory of RI/AA. RI/AA provided a grounded account of the data and produced a theory of recursive adaptation for technology integration on teacher's management of resources and maintaining of identities. These results fit a structurational account of the data, though the grounded theory itself does not explicitly identify this theory. Nonetheless, structuration research is the primary extension of the grounded theory based on its results and features. Moving forward, extant models of structurational research such as Adaptive Structuration Theory applied to management of resources will be useful. In addition to structuration, the organizational communication aspects of the study are undeniable. Finally, the identity maintenance that the grounded theory suggests teachers are going through should be investigated through Identity Control research. The

application of Identity Control can verify this aspect of RI/AA and further investigate the mechanisms that drive it.

The final research question examined the impact of the integration of technology on the teacher-student-parent relationship, and produced the ISM. This result needs further examination through a study that will confirm the findings or provide an alternate finding(s), and examine the impact on parent involvement, richness of communication and the increased saliency of content. To examine the effect of the use of devices on these features of the ISM, sociomateriality-based approaches can uncover the relationships between the social and material characteristics of the interrelation that stakeholders experience through integrated applications.

Final Thoughts

This dissertation examined the problematic of the ascendency of new/mobile technology and media in educational institutions and its influence on K-2 teachers and teaching. Over the past several years, new/mobile media has been disseminated in elementary classrooms and recently reached a high level of penetration. The advent of operating systems in 2010 allowed for the advent of the smartphone and later the tablet, and by 2012 schools had already begun to significantly integrate new/mobile technology. A flood of technology between 2014 and 2016 meant that the K-2 classroom had adopted a consistent level of technology, particularly in the suburban schools where budgets tend to be relatively higher than urban or rural schools. Extant research on the phenomena revealed that teachers lie at the intersection of expectations and implementation of technology in the early education classroom.

The research for the production of this dissertation proposed an exploratory study of the impact of technology on the process of teaching and teachers, and also asked how teachers

evaluated technology as a tool for the delivery of knowledge. The final research question examined the impact of the integration of technology on the student-teacher-parent relationship.

The results if this study showed that teachers need support and guidance as they manage the task of teaching the next generation of learners. Technology has exacerbated the complex task of balancing the academic and social needs of students and complicated the teacher's responsibility to deliver on these desired learning objectives in the classroom. Meanwhile, the deployment of technology has improved the success of students and the ability of teachers to serve them. It is at this point where this study rests. Technology integration provides great promise for the educational stakeholders that deploy it. As early educators confront the instructional communication and pedagogical implications of technology, they must maintain the critical relationships that enable learning. As the integration of technology continues, it is the *teacher* that stands between the promise of what technology can do, and the difficulty of doing it.

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Appendices

Appendix #1. Initial Interview #1 Protocol

Time allowed: 65-75 minutes

Interview type/Method: The method for the initial interview will be a *face-to-face* and semi-structured. However, these interviews will be conducted in a conversational tone. The interviewer will begin with a question and then will loop, follow-up and juxtapose in order to introduce additional question from the protocol list and cover the intended subjects. The order of questions will be non-linear, allowing participant answers to dictate the flow of questions and increase the richness of the data. Finally, the interviewer will allow some freedom of deviation from the protocol on the part of the participant and re-direct only when time limitations demand.

Implications: The list provided will be a topic list rather than a prescribed interview protocol. It will also likely not be in the order presented here. However, it will provide a substantive view of the topics addressed.

Pre-interview orientation: Before the interview begins, the interviewer will thank the participant for their time, remind them of their anonymity and confidentiality, as well as their right to stop at any time. If not already completed, the informed consent will be signed and the participant will be given the stipend/gift card.
• Finally, the interviewer will define "technology integration" for the participant by providing several types of technology implemented in schools and also provide several examples for each type of technology. This will be a review from the original intake/recruitment, but will orient the participant for the interview.

***Questions*:**
Research Question #1 – "Teacher e*valuation of the influence of technology on desired learning objectives*"

• How would you describe your role and what you do to someone that was not familiar with K-2 teaching?

• How would you summarize the role that technology plays in the teaching process?

• What is the most valuable contribution that the use of technology contributes to the education of young students?

• Does the school/district have expectations or guidelines for the use of technology in the classroom? Do you believe these expectations are realistic?

• What makes you excited about the future of education because of the implementation of technology? What concerns you about the future of education because of the implementation of technology?

• What do you think is the primary benefit of using modern technology in early education?

RQ2 – "*How technology impacts the teaching process"*

• Does technology facilitates your work as a teacher? In what way?

• What criteria do you use when determining if a technology will benefit your teaching?

• Do you ever have problems implementing technology? What are they? How are these issues resolved?

• What do you appreciate the most about using technology in your teaching? What things are you the most concerned about when using technology in your teaching?

• What would you lose as a teacher, if you had to give up modern technology

RQ3-A What influence does technology have on the *development of the student/teacher/parent relationship*

• What is the most important skill to develop as a teacher for using technology to help young students and their parents? Why?

• What kind of technology helps to solidify relationships with students, teachers and parents? How does this work? [or] Why doesn't it work?

• In what way a does technology help students, teachers and parents interact with one another?

• Do you feel that it is easier for some students, teachers and parents to use technology more than others? Why is this?

• When a student or parent is struggling with a technology in the classroom- what do you do to help them?

• How do you react when there are significant gaps among your students or parents experience or capability with technology? How did you address this?

• Have there been situations where you have avoided using technology when problem-solving or working with your students and/or parents?

Appendix #2 Elicited Text (Journal) Data Collection

Description of elicited text: The elicited text will take the form of a written journal (See below for electronic alternate). The participants will write about at least two of four prompts that are provided to them during each journal entry. A notebook with a front folder will be given to each participant at the end of the initial interview. There will be a "prompt card" in the front folder of each notebook that the participant can pull out and review prior to each journal entry. The notebooks will be collected after a period of two weeks. (Note: An extension past the two weeks will be given under extenuating circumstances).

Time Span: The participant will make entries in the journal 8 out of 10 school days that they have the journal in their possession. Each entry is requested to be 12-15 minutes of writing.

Electronic Alternate: In the case that a teacher requests an electronic journal, they will still be given the folder so they have a prompt card. In the case of an electronic journal, the participant will be asked to send the entries to the PI as soon as they are complete. This will provide more efficient data collection and will act as an accountability trigger for both the participant and PI.

Note: Prompt Card Example Below

Elicited text (journaling) prompt instructions. ***SIDE 1***

Side 1 Research Project Participation - Part 2

Thank you for agreeing to participate in the "K-2 teacher technology integration research project". The following information will help you with this phase of the research.

• Your initial interview was a great way to get to know you and understand the big picture about your experiences and inclination about technology, and your relationships with students. In this phase of the project you will be able to provide your thoughts on the subject on the same day they occur, by writing in a journal.

• The journal and this "prompt card" is designed to help you to reflect on the days events as an educator, and about your life in the classroom. The other side of the card has prompts about the two areas that we discussed in your interview and we want to hear more from you about;

- *The ways that you use technology today and how that effects your goals for learning and;*

- *How technology influences your ability to build relationships with your students.*

As a reminder, there are no wrong answers. We want to learn from *YOU*, so please share your authentic knowledge and feelings, regardless of any particular viewpoint.

PLEASE TURN OVER THIS CARD

Prompts for your journaling ***Side 2***

Entry Instructions: Use this journal to write your responses. Please respond to *more than one* of the following prompts during *each* journaling session. Try to write between 12-15 minutes for each day (more is great if you want to on some days). Please place the date at the top of your journal and start on a clean page for each entry. The project would like to have entries for eight (8) of the ten (10) school days that you have the journal. It is *not* required, but if possible, try to address *each* of the prompts below in your journaling over the total 10 school days of writing your entries. Thank you again for your participation!

Note: *Please do not use student names*. You can create pseudonyms or just use "student", "girl student" or "boy student".

Prompts:

1. In what ways did the availability of technology in your classroom influence your ability to teach today?

2 Based on your experience in the classroom today - What would you change about the technology you are able to utilize in order to improve your ability to deliver on learning objectives? (Please include today's situation in your journal entry)

3 What influence did the use of technology have on your ability to foster relationships with students in your classroom today?

4 (a) Describe the way in which your own adaptations and adjustments to the integration of technology *improved* your ability to build relationships with a student(s) in your class today. **[-or, conversely–]**

(b) Describe the way in which your own adaptations and adjustments to the integration of technology acted as a *barrier* to the building of relationships with a student(s) in your class today. **[or, finally]**

(c) Describe the way in which technology changed the communication you used (or were able to use) to foster a relationship with a student(s) in your class today.

When complete- Please return card to folder sleeve until next entry