Pursuing More Equitable Technology Integration in Elementary Education:
Post-Intentional Phenomenological Research Productions and Provocations

A DISSERTATION
SUBMITTED TO THE FACULTY OF
UNIVERSITY OF MINNESOTA
BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Dr. Cassandra Scharber and Dr. Mark Vagle, Co-Advisers

August 2018

Acknowledgements

"Remember who you are and what you stand for." - Joni Marti

Growing up my mother said this phrase to me every time I left the house. She intended the phrase to mean 'make good choices' - along the lines of staying out of trouble, making smart decisions, and treating others as I'd like to be treated. Yet, this simple phrase has evolved into an all-encompassing embodiment of who I am - as an educator, and as a human. I stand for inclusive education. I stand for inclusive communities. I stand for productively disrupting the status quo in education to build a more just future. I stand for service through education as my life's work. This dissertation, as an embodiment of how I "remember who I am and what I stand for", was made possible by each of you. In sincere appreciation to all who have supported this journey, thank you.

While it is utterly impossible to acknowledge and honor all who made this dissertation come to fruition, I would like to recognize the following for helping me grow not only as a scholar, but more importantly as a person:

★ My co-advisers - Dr. Cassandra Scharber and Dr. Mark Vagle, for pushing me to the boundaries of my understandings so I may think differently and for facilitating my work at the intersections of learning technologies and elementary education fields.

★ My committee members - Dr. J.B. Mayo and Dr. Annie Mogush Mason, for modeling how the 'critical' may be put to work in education to make social change towards a more just future.

★ Our University of Minnesota C&I community - with a special nod to Dr. Jana LoBello, Kathy Byrn and Dr. Karl Jung, for being inspiring colleagues and friends.

★ My fellow LTers - Daryl Boeckers, Yu-Hui Chang, Neal Fredrickson, Lynnea West, Yeng Chang, Derek Schwartz, Kris Isaacson, and Dr. Fan Ouyang, for always putting people first, for seeing technologies as a way to humanize education and for sharing kindness, laughter and tears with me.

★ My PIPsters - Sara Sterner, Dr. Liv Christensen, Dr. Kelly Gast and Dr. Jen Niedzielski, for living in the entanglements of post-intentional phenomenology, for supporting each other with caring words, scholarly pose and sarcastic humor in the never-ending iterative-ness of our work, for making space for each other to fully feel in the moment (even if a few of those moments were full on hot messes) and for lifting up each other as 'women who know things'.

★ My participants - Claire, Eddie, Kai, Olivia, Rachel and Wade, for giving of yourselves, your time, your energy, your minds and your hearts.

★ My learners - past, present and future. You bring the purpose, the *WHY* of what I do. May you experience diverse inclusion. May you feel welcomed, supported, loved and empowered for who you are.

★ My family and friends, for supporting my journey in achieving the goal my seventeen-year old self made on a college visit (in what feels like many lifetimes

ago) - your sacrifices, support and love were vital to this achievement. You helped me find my way when I felt lost and attempted to operate outside the bounds of my comfort zone (at times successfully, at other times not so much). Thank you for indulging me with Chai, Nadia Cupcakes, Moscato, Dairy Queen, Captain and Wiley Wallaby liquorice (seriously people 'PhD pudge' is a real thing… and it's totally okay - yes, I know, I should love carrots and spinach and water or whatever, but I don't). Most importantly, I appreciate how you have loved me fiercely through it all!

★ To those who take up and extend this work, I believe the ways in which we co-construct this world we belong to demands us to take up an active role in improving it. Ultimately, this is THE work of education. I offer a 'nod' to you in advance for the conscious action to construct educational spaces and practices in ways that are respectful, equitable and empowering for all community members. Together, may we recognize, critique and confront the world's inequities.

Thank you for facilitating my journey, for expanding my horizons, for challenging my thinking, for (re)cultivating my love of learning and for being a part of the ways in which I strive to be fully human.

You. Are. Appreciated!

Dedication

This work is dedicated with love and gratitude to my family. You have made sacrifices

beyond measure while being supportive, patient and loving throughout this journey.

Winky, Riley, Peyton, Wesley and Logan, I dedicate this dissertation to you.

My wish for you is that you make space in your lives to notice, seek to understand,

critique and confront inequities in our world - and do so not as a 'savior', but with a

fierce love for humanity to create a more inclusive and just future.

Abstract

Teaching practices, whether intended or not, privilege and marginalize particular groups of people. Inequality in education reflects inequality in society. The different ways in which technology is used may bolster or reinforce social inequities (Araque, Maiden, Bravo, Estrada, Evans, Hubchik, Kirby & Reddy, 2013). The digital usage divide (Warschauer, 2003; Warschauer & Matuchniak, 2010) positions technology usage as an influencer on social divides through educational, social, political, cultural, linguistic, economic and institutional contexts (Araque et al., 2013; Gherardi, 2016; Selwyn, 2010; Warschauer, 2011a). Thus, technology usage is not neutral, and, conceptualizing the digital divides as social divides is powerful for equity work in education.

As educators, and more importantly as humans, the ways in which we co-construct this world we belong to begs for us to take up an active role in improving it. This dissertation situates technology use in elementary education as simultaneously a social issue and social opportunity. The phenomenon under investigation, pursuing more equitable technology integration, was explored using post-intentional phenomenology methodology (Vagle, 2018) as it was produced, provoked and took shape.

I designed and facilitated a professional learning cohort for six elementary educators, across four schools and three school districts. Professional learning cohort experiences centered on topics such as: digital divide; digital usage divide; participatory technology integration; race, social class and gender in the classroom; anti-bias education, technology use for social justice; and technology integration beliefs and practices. Participants gathered for three cohort meetings, engaged in a 1:1 conversational interview and informal interview follow-ups between November 2017 and May 2018. I used an iterative process to analyze across and through phenomenological materials (i.e. cohort artifacts, interview audio/video/transcripts, participant follow-up and a post-reflexivity journal), theory and post-reflexions.

As with all equity focused work, there is a *never-done-ness* nature to the constant interrogation of, and the relationships with, equity social issues within technology integration practices. To this end, I offer three vivid illuminations (findings), with respect to the pursuit of more equitable technology integration: unOthering, questioning societal implications and achieving homeostasis. Concluding thoughts and productive speculations of this dissertation invite you as readers, as scholars and as educators to engage with three social issue → social opportunity conceptions:
1. Wobble [the Technology Integration Ecosystem];
2. Be Profoundly Present [in the Entanglements]; and
3. [Temper] Being and Becoming.

In each, plausible possibilities for the fields of learning technologies, elementary education and/or teacher education are shared as means of social change towards a more just future. In which case, I conclude opportunities for social change dwell not within the technology tools themselves, but in the relationships among people, social systems and usage of these tools to represent and produce more equitable ways of knowing and being.

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Chapter 1: Technology Integration in Elementary Education -

Simultaneously a Social Issue and a Social Opportunity

*"New digital technologies have the ability to change the balance of power
and extend voice to silenced populations."*

- Dr. Libbi Miller, in *Claiming Technology for Democracy and Social Justice:
An Approach to Educational Technology,* 2016

Students from Marjory Stoneman Douglas High School, which is located in
Parkland, Florida, experienced an incomprehensible tragedy of a mass shooting in their
school. Now they are transcending across digital platforms into social action and
amplifying their voices towards social change. This group of grassroots gun reformers
have crafted op-eds and confronted lawmakers in press conferences and televised
interviews. They also were featured during a nationally broadcasted CNN town hall
where they asked point blank questions of their elected officials and the National Rifle
Association. Emma Gonzalez, David Hogg, Cameron Kasky, Alex Wind, Sam Zief, Julia
Cordover, Jaclyn Corin, Kyle Kashuv, Ariana Klein, Alfonso Calderon, Sophie Whitney,
Lorenzo Prado, Lane Murdock, Sarah Chadwick, Delany Tarr, John Barnitt, Matt
Deitsch, Diego Pfeiffer, Aaliyah Eastmond, Adam Alhanti and others launched
#NeverAgain, amassing and leveraging a significant following on social media. Through
Twitter and other digital platforms, they initiated a National School Walkout on March
14, 2018 (Atler, 2018)[1] with nearly a million participants for 17 minutes in remembrance

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[1] It is relevant to note that privilege is operating within this movement. Student activists have been met
with support from school administration, college admissions offices and high-profile celebrities funding
their cause. This support is unlike the experiences of activists of color who came before them. For
example, in the wake of Michael Brown's death the coalition against gun violence in Ferguson, MI was met
with riot gear and clashes between police and protesters.

of lost lives due to gun violence. Further, #NeverAgain students organized a student-led national march on March 24, 2018. This #MarchForOurLives focused on gun reform and expanded voter registration; the march took place in Washington DC along with 800 additional registered demonstrations in all fifty states (Alter, 2018). As reported by Chenoweth and Pressman (2018) at least 1.3 million students and their allies[2] took to the streets for social change during this march. Highlighting the relationships among people, social systems and the use of technology, students in this movement have resolved to awaken the nation and (re)make our society through their authentic voices and use of digital platforms.

Marjory Stoneman Douglas (MSD) High School's #NeverAgain students have put in motion a teen revolution. They are articulate, witty and passionate for change - not unlike those who have taken a stand before them. What is different now is how they masterfully employed the affordances of technology in sophisticated ways to position and amplify their voices. These students' abilities to create content, mobilize virtually and participate socially via technologies did not happen overnight. According to Dr. Littau, Journalism Professor at Lehigh University, the students have used "the tools they have in front of them to speak out… but with this group, they are inherently wired to think about it in terms of digital communication" (as cited in Newcomb, 2018). Given the rates at which affluent areas access technology at a young age in comparison to non-affluent areas, we should consider the effects that this access may have on the ways in which

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[2] According to Headcount more than 4,800 new voters registered at 30 of the nationwide March for Our Lives events on 3-24-18 (this number calculated in person voter registration with an undetermined number of online voter registrations) (Willingham, 2018).

these different activist groups use social media and technology to communicate their messages. For example, #NeverAgain's savvy messaging in digital platforms was notable. To illustrate, Corin (a MSD student) emphasized, "social media is our weapon, without it [social media], the movement wouldn't have spread this fast" (as quoted in Atler, 2018). These tech-empowered students have developed their digital literacies[3] over the course of years.

Given that Corin and others in similar affluent schools have developed their digital literacies through the span of years, they are well-equipped to launch a digital social movement compared to others who have not had the same types of access to and experiences in digital literacy. MSD students' call to action garnered momentum in part due to their life circumstances. Delaney (a MSD student) shined a light in another layer of privilege at work. She acknowledged, "We know that the reason that we're getting this attention is because we're [mostly] privileged white kids… because if you look at Chicago, there's such a high level of gun violence. But that's not getting the attention that this [school shooting] is getting because we're in such a nice area" (Miller, 2018). #NeverAgain students concede that activists of color, often in urban communities, have not captured the same visibility and financial support. They have explicitly named this discrepancy and social injustice in tweets, press conferences, interviews and op-eds. Remarkably, students joined forces and coordinated efforts with fellow gun violence

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[3] Digital literacies are the abilities to use technologies to find, evaluate, create, communicate, collaborate and problem-solve information through cognitive and technical skills, strategies and processes. Digital users make decisions as they interact with multimodal texts (e.g. hyperlinks, videos, images, comment sections, blogs, Tweets, podcasts, YouTube, etc.) using tools which foster social participation.

activists whose voices have previously been silenced or disregarded[4] (Gonzalez, 2018; Atler, 2018). By means of digital tools, MSD's #NeverAgain students amplified the voices of all who have experienced gun violence and have inclusively taken a stand to seek change in legislation. Ultimately, these technology literate students participated across a broad digital spectrum towards enacting social change.

The aim of this dissertation is not to investigate the #NeverAgain movement, nor does it intend to disregard or further politicize the epidemic of gun violence communities have had to endure. However, the social actions of these students through the affordances of technology are important in offering a powerful example of what is possible in modern practices of social participation. I use this #NeverAgain movement exemplar to introduce a grounding concept in this dissertation - *technology use as a means of social participation*. This concept is scaffolded through technology integration in schools where social participation may foster social change.

The use of technologies can play a fundamental role in education for social change, particularly in the ways schooling can aid in the development of digital literacies like those on the front lines of the #NeverAgain movement. For example, #NeverAgain students leveraged their digital literacies to increase awareness, spark civic conversation,

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[4] While media and societal interest festered around the gun violence event in an affluent suburb, #NeverAgain is making intentional moves for an inclusive platform for youth from different backgrounds and different experiences with the gun violence issue. For example, raising collective voices through partnering with gun violence activists Clifton Kinnie (Ferguson, Missouri); Nza-Ari Khepra, Journey Jamison, D'Angelo McDade, Alex King, Mya Middleton, and Trevon Bosley (Chicago, Illinois); Kenidra Woods (St. Louis, Missouri); Jazmine Wildcat (Rivertown, Wyoming); Christopher Underwood (Brooklyn, New York); Naomi Wadler (Alexandria, VA); Edna Chavez (Los Angeles, CA) and inspiring Yolanda Renee King [as seen speaking during the Washington DC March for Our Lives Rally and as represented in Maloney (2018) and Gonzalez (2018)].

invite community participation, motivate policy/practice changes and address injustices.

Along these lines Miller (2016) emphasizes:

> when used deliberately, digital technologies, such as computers, social media, digital video, and digital photography can play a central role in democratic education and education for social justice. These technologies are versatile and can lead to multifaceted ways of communicating, engaging inquiry, asking critical questions, and conveying ideas." (p. 20)

In other words, Miller believes technology can connect to and extend larger social opportunities outside of schools. The #NeverAgain movement's deliberate use of technology by high school students, specifically social media, generated civic engagement and social action across the nation. This dissertation delves into technology use in elementary education as simultaneously a social issue and social opportunity. I am interested in the ways in which technology integration is taken up in elementary education so that it may foster social change towards a more just future.

Background of the Social Issue

To lay the foundation for this dissertation, this introduction attends to the call for a critical viewing of technology integration. The following school snapshots provide representations of technology integration in elementary education. Consider what these snapshots illustrate about teaching and learning with technology in each school context:

"All kids deserve learning spaces that support collaboration and student interaction, but what if an entire school became that space
what if a school's very ethos was forged in collaboration and student voice?
It's very much in the same vein as engineering and design work.
When our students walk through the doors they can expect
to interact with world-class [learning] opportunities, technology, and each other.
When combined with our 1:1 devices aimed at student creation our school is an
environment where students are encouraged to develop to their fullest potential."
                                        - Mr. Sandburg, Principal at Warren Elementary [pseudonyms]

"I recognize technology is key, but in our day to day classroom lives it is a struggle.
I have a projector and 4 iPads.
I have 31 first graders in my class.
We can work on math facts, play a shapes game and listen to leveled stories in stations.
I can't add any other apps because they are not approved by our district tech person."
- Ms. Kochlan, Teacher at Berwin Center Elementary [pseudonyms]

"Warren Elementary designed and implemented a mobile makerspace[5] fleet.
We position collaboration to be part of who we are with cutting edge tools, circuitry,
coding, and 3D printing. Every classroom, every hallway, is now a place where
collaboration and student learning reign in the intentional redesign of the entire school."
- Mr. Sandburg, Principal at Warren Elementary [pseudonyms]

"In our school, as a group, most students and teachers
are lacking and seriously behind in their tech skills.
I aim to change that throughout this year and beyond.
I don't really know what I am supposed to do with the Chromebook cart though
so it mostly sits in the corner of the room
except for free choice and indoor recess times.
I want to learn.
There just wasn't any money left after purchasing devices to teach us where to start."
- Mr. Windstrop, Teacher at River City Elementary [pseudonyms]

"Student voice is amplified through tweeting, blogging, Skyping, podcast challenges
and student produced newscasts
- all made possible with our technology resources.
Green screens in the video recording studio, an audio recording studio and
a class sized video conferencing room all support our [innovative technology] mission."
- Mr. Sandburg, Principal at Warren Elementary [pseudonyms]

"I am interested in learning more about how technology integration
can help my underserved students to be successful in an academic environment.
I had five iPads for my classroom and my parents donated two.

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[5] A school makerspace is a place where learners have opportunities to explore their interests; "learn to use [low tech and high tech] tools and materials, both physical and virtual; and develop creative projects" (Flemming, 2015). Making positions constructivist and constructionist learning theories at the forefront of turning knowledge into action. Learners and educators shift away from consuming technology towards a culture of applying technological knowledge to problem-solving and creating in educational settings (Martinez & Stager, 2013).

One has the headphone plug broken inside of it so there isn't working sound.
Another one lost the war with Silly Putty so it can't be charged.
One iPad has a cracked screen
because I couldn't afford to buy the cases and screen protectors too.
The rest of the iPads are controlled by the IT people and
they aren't responding to tickets to install apps so my learners can show what they know.
I did a Donors Choose for an iTunes gift card
so I can afford to put some apps on them for my students."
- Ms. Johnston, Teacher at Cadott Elementary [pseudonyms]

These school snapshots at Cadott Elementary, River City Elementary, Berwin Center Elementary and Warren Elementary portray the influences of socioeconomic status on technology integration inequities across school communities. At Warren Elementary, the school's mission incorporates innovative technology uses for learning and is well funded in the affluent school district. Mr. Sandburg describes not only opportunities, but expectations, for learners to regularly use technologies to explore, problem-solve, create and communicate with the world. Learners at Warren Elementary, like the #NeverAgain students, are tech-empowered to engage in the world. In stark contrast, at Cadott Elementary, a mere 16.3 miles down the road, limited and damaged technology devices are used for remediation, not for social participation and potentially social change. Armfield (2016) reminds us:

> It is not simply the access to the technology; it is also the way in which the technology is used [that perpetuate digital inequalities]. In the low socioeconomic classroom, students are more likely to use technology for "drill and kill" or word processing, whereas schools with higher socioeconomic statuses have a greater focus on exploration, creativity, and problem-solving (Darling-Hammond et al., 2014). It is critical for the teacher to understand individual students and to know what technological social capital is available to their students (Gilbert, 2010). Such understandings will allow the teacher to think through content, pedagogical practices, and technological resources and ensure that no students are disenfranchised by the process [of integrating technology into learning opportunities]. (p. 111)

As represented in the preceding school snapshots, Armfield's discussion around digital inequalities reiterates the vast disparities in the ways in which technology can be leveraged for social capital[6]. For example, Warren Elementary learners experience distinct learning opportunities with technology, which may increase their social capital. Their innovative and diverse digital platforms for learning champion voice and agency. When voice and agency is combined with digital technology students may have the ability to change the balance of power and facilitate social change - as seen with the #NeverAgain student activists.

To this end, technology usage is not neutral - "it should be approached as a social and behavioral phenomenon" (Barzilai-Nahon, 2006, p. 275). Warnick and Burbules (2007) suggest that educational technology researchers move beyond comparing effectiveness of educational technologies as an information delivery system towards a reflection of holistic educational practices. Holistic explorations encompass social issues at work within technology integration practices for learning and work across intersections of people, social systems and use of information and communication technologies (ICT)[7]. With the understanding that education in and of itself has its own histories of inequities power, positioning and privilege influence technology integration, teaching, and social

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[6] In this research, social capital is considered to be relationships among resources (such as people, goods and services, property, policies and practices) for a common good. The impact societal relationships have on the resources may construct or constrict social opportunities of diverse groups culturally or economically.

[7] Information and communication technologies (ICT) may be understood as involving any technology that will store, retrieve, manipulate, transmit or receive information in a digital form. For the purposes of this research, ICT is viewed as the technology tools that afford the transmission and creation of information and communications.

practices. Power, positioning and privilege play a role in what and how schools teach.

These intersections that educational inequities may be made visible and productively

disrupted.

Drawing upon Selwyn's (2010) summon for a more critical examination of

educational technology, this research study of technology integration in the context of

elementary education operates with two assumptions. First, technology use may facilitate

social participation. Second, social participation may foster social change. Taking

interest in the role of how technology is used in schools, Selwyn asserts:

> The academic study of educational technology has grown to be dominated by an
> (often abstracted) interest in the processes of how people can learn with digital
> technologies… [G]reater attention now needs to be paid to how digital
> technologies are actually being used… showing a keener interest in the social,
> political, economic, cultural and historical contexts within which educational
> technology use (and non-use) is located. (p. 66)

Although I agree with Selwyn, stopping at an 'interest' in the social, political, economic,

cultural and historical contexts of technology usage in schooling may unintentionally

perpetuate inequitable practices. In this research, I draw on Selwyn's concept of critical

viewing of technology usage and advocate it be used in pursuit of equity-focused social

change. Specifically, I suggest that elementary education and learning technologies can

serve as a starting place for this equity-focused social change.

Terms and Trends: Elementary Education and Learning Technologies

It is beneficial to designate that elementary education is as both a field and a

context in this research. It can be argued that the United States school system operates

with a time bound conception of development (Vagle, 2012). Elementary school

educators are trained with an emphasis on the 'whole child' to teach all content areas (i.e.

English/language arts, mathematics, science, social studies). It is striking to note the United States Department of Education does not currently have a clear definition of elementary education as reflected on their https://www.ed.gov/ website (2018). Without an articulated conception of elementary education, one must refer to the time bound practice of learners being organized by age/grade to construct an understanding. As reported by the National Center for Education Statistics (2010), elementary grades may be comprised of kindergarten through grade eight. Many people consider primary education in the United States to encompass pre-kindergarten through grade six (ages four-eleven). Others claim early childhood consists of birth through age eight and elementary consists of ages seven through ten. This research establishes early childhood education as birth-grade three and elementary education as grades one-six as determined by the state's (Minnesota) licensing requirements for educators.

Within the first years of formal education, elementary students, at a minimum, learn basic skills and strategies in language, mathematics, science and history. Elementary education is shaped around norms for child development (Lee & Vagle, 2010) which have heavily influenced stage discourses, developmentally-appropriate practices and standardized instruction (e.g. the Common Core learning goals for each grade level and the Minnesota Comprehensive Assessment). While discourses of stage developmentalism and the accountability movement driven by standardized assessments permeate the field, there are other trends that pave alternate paths for teaching practices.

The following topics are currently trending within elementary education[8]:

STEAM/STEM; project-based learning (PBL), culturally relevant teaching/pedagogies

(CRT/CRP), trauma informed teaching, 1:1 technology initiatives and digital curricula.

Additionally, issues around the homework debate, accountability and the achievement

gap were prevalent in educational literature related to professional learning communities

as well as legislative policies. There is a lack of scholarship positioning elementary

education as the focus with its own commitments and nuances. More often than not

elementary education is researched less as a field and more as a context. One implication

of treating elementary education as a context instead of a field is that it diminishes

elementary education's importance as a scholarly space. In this research elementary

education as a field is privileged in the same way as learning technologies is a field.

In the field of learning technologies (LT), learning is positioned at the forefront.

Learning technologists utilize ICTs and other related educational technologies to actively

research learning, with aims to facilitate learning processes and improve education,

regardless of context. Due to the fact that technology is integrated into teaching and

learning in vast and disparate ways across and through philosophical, political and social

practices within schooling and pedagogies, the term "technology integration" is often

employed without a concise or normed definition (Bebell, Russell, & O'Dwyer, 2004;

Belland, 2009; Hew & Brush, 2007). Technology integration is commonly considered to

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[8] These topics were determined from a combination of vantage points in the field. First, I ran *elementary education* through the ERIC database and noted topics of peer-reviewed articles from 2008-2018. Then I tracked topics through a Google Scholar search of elementary education peer-reviewed articles from 2008-2018. In order to incorporate a practitioner lens, I also complied topics from educational blogs, podcasts and Twitter with in-service educators as a target audience. Lastly, I noted professional development topics participants identified as current trends in their respective schools and school districts.

be the leveraging of technology as an aspect of teaching and learning to support student outcomes. Jonassen (1996) categorized student interactions with technology as learning *about*, learning *from,* or learning *with* technology. Building upon Jonassen's vision of learning *with* technology, Ertmer and Ottenbreit (2013) incorporate pedagogy in their conception of technology integration, which they refer to as 'technology-enabled learning' so that emphasis is placed on pedagogy rather than infusion of tools. Addressing pedagogical practices in teaching and learning with technology is crucial for learning technologists and educators in order to facilitate equitable educational practices, including knowledge construction and social participation. Accordingly, the term technology integration, as it is applied in this research, leverages technology in conjunction with pedagogy to facilitate student learning.

Schneider and Smith (2014) assert technology has "changed how we participate in education" (p. 3) and recommend explicitly incorporating a critical gaze on the relationship between technology and power. Many scholars extend this assertion and offer critical insights into the relationships among people, social systems and technology, suggesting that the use of educational technology combined with critical perspectives creates conditions to advance equity-oriented practices (Armfield, 2016; Becker, 2016; Gherardi, 2016; Kruger-Ross, 2016; Miller, 2016; Miller, Becker & Becker, 2016). If equity-oriented practices are the aim, then "the relationship of technology to power will always need to be addressed. Technology is deeply embedded within and tends to advance the interest of power, power that produces subjectivities that are progressively merged with technology" (Foucault 1977, as cited in Schneider & Smith, 2014, p. 6).

This positioning of technology in relation to social powers has important consequences for the broader domains of technology integration and education writ large.

Purpose of the Research Study

Teaching practices, whether intended or not, privilege and marginalize particular groups of people (Nielsen-Winkelman & West, 2016). A critical viewing of what and how learners are taught in the digital age sheds light onto the relationship among people, social systems (schools), and ICT use to understand how they produce, reify and deconstruct each other. Symcox asserts, "power is used to legitimize knowledge; to decide which knowledge or truth is the correct one" (2002, p. 4). With knowledge being "a valued commodity, defined by those with power and dispensed to those without" (Symcox, 2002, p. 11), the power of technology integration and teaching practices in society are vital to social participation and knowledge production.

However, when the affordances of technology are not in dialogue with a critical lens, modern practices of social participation and knowledge construction may be barricaded from learners. Armfield (2016) argues that a dynamic and responsive perspective of these modern technology integration practices is vital in schooling because such practices may prepare learners for their relationships among people, social systems (schools), and ICT use for productive participation in their social and economic futures. Accordingly, exploring conceptions of the digital divides (DiMaggio & Hargittai, 2001; Hargittai & Hinnant, 2008; Selwyn, Gorard & Williams, 2001; Valadez & Duran, 2007; Warschauer, Knobel & Stone, 2004) are one way to understand the relationship between people and their use of digital tools within schools.

Selwyn (2016) sets forth technology as an integral apparatus in transforming schooling with social participation and change in mind. Technology use is considered a process for social change - not the product or finish line. As with all equity-focused work, there is an incomplete nature to the constant interrogation of and the relationships with power and equity social issues within technology integration practices. The use of technology has become "woven into social systems and processes" (Warschauer, 2003, p. 47). Thus, technology in education as a social system can be conceptualized as a means toward equitable change. This post-intentional phenomenological study aims to better understand technology integration in conjunction with equity efforts in elementary education.

Phenomenon. Utilizing post-intentional phenomenological conceptions of phenomenon (to be discussed in Chapters 4 and 5), a phenomenon may be understood as circulating and evolving in a constant state of construction. This dissertation probed technology integration as a circulating rhizome, with the intention to demystify and un-enshrine the status quo of technology integration perceived as separate from the unseen interwoven social structures of power.

Research Questions. The following research questions guided the investigation of the phenomenon in this research study.

Primary research question. Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse[9] school community?[10]

Secondary research questions.

1. What are some of the underlying technology integration beliefs and practices at work, if any?

2. In what ways, if any, do the lived experiences of in-service educators evolve throughout involvement in professional learning experiences?

All learners, regardless of markers of difference (i.e. socioeconomic, race, gender, sexuality, culture, language, class, religion, ableness, etc.), deserve holistic learning opportunities that foster social transformation. Opportunities dwell not within the technology tools themselves, but in the relationships among people, social systems and usage of these tools to represent and produce ways of knowing and being. Crichton and Carter (2015) remind us to regard educational technology as tools which empower human capabilities - just as the digital platforms gave voice to student social action in the #NeverAgain movement.

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[9] "Diverse" is used here to describe a diverse group as a school community. This means that the school community includes learners and their families of many different identities/expressions (e.g. socioeconomic, race, culture, language, class, religion, gender, sexuality, ableness, nationality, learning preferences, exceptionalities, etc.). Diverse is used to describe people that vary from one another, not from what society considers "normal".

[10] There is an assumption of inequitable technology integration (Arague, Maiden, Bravo, Estrada, Evans, Hubchik & Reddy, 2013; DiMaggio & Hargittai, 2001; Norris & Conceicao, 2004; Page, 2002; Valadez & Duran, 2007; Warschauer, 2000, 2004, 2011a; Warschauer, Knobel & Stone, 2004) practices woven into this research question. This is an assumption I generally hold with regard to how technology is integrated into teaching and learning in the elementary setting. In keeping with post-intentional phenomenology as a methodology, it is expected to work with assumptions. Researchers name assumptions and interrogate how the assumption might be shaping the phenomenon in particular ways.

Significance of the Study

As educators, and more importantly as humans, the ways in which we co-construct this world we belong to begs for us to take up an active role in improving it. "We do not only belong to the same world, we constitute the meaning of this world, of myself and the other, together. We do this my means of experiencing, acting in the world, and by expressing it" (Dahlberg, Dahlberg & Nystrom, 2008, p. 63). A more critical understanding of technology integration equity work in elementary education may lead to the advancements in the fields of learning technologies and elementary education. Specifically, a critical lens on technology integration in elementary education suggests social opportunities dwell not within the technology integration tools themselves, but rather in the relationships amongst people, social systems and usage of these tools to represent and produce more inclusive ways of knowing and being.

Organization of Chapters

In the next chapter, Chapter 2, I review relevant technology integration literature illustrating historical underpinnings and understandings, define terms, tensions, and trends in this research and position equitable technology integration as a social issue within elementary education. In Chapter 3, the digital divides and participatory practices in technology integration literature and opportunities are discussed. In Chapter 4, the conceptual commitments for this dissertation are identified: technology integration as an ecosystem, epistemological pluralism, phenomenology writ large, post-intentional phenomenology and critically-oriented thinking. In Chapter 5, this study's methodological approach, post-intentional phenomenology (Vagle, 2018), with its five

component research design is shred. In Chapters 6, 7 and 8, this study's three vivid

illuminations (findings) are examined related to the phenomenon being conceptualized as

a social issue: *unOthering* to make space for equity work within technology integration,

questioning societal implications of technology integration practices in elementary

education, and *achieving homeostasis* within a technology integration ecosystem. In the

final chapter, Chapter 9, I present concluding thoughts, articulation of research

limitations and offer productive speculations for the fields of learning technologies,

elementary education and teacher education.

Chapter 2: Technology Integration Review of Literature

"In today's society, the ability to access, adapt, and create knowledge using information and communication technologies is critical to social inclusion."

- Dr. Mark Warschauer, in *Technology and social inclusion: Rethinking the digital divide* (2004, p. 9)

It is important for educational practices, including technology integration practices, to be intentional because the different ways in which technology is used may bolster or reinforce social inequities (Araque, Maiden, Bravo, Estrada, Evans, Hubchik, Kirby & Reddy, 2013). The previous chapter introduced examples where the technology affordances, schooling practices, and social participation worked together to create social change. This chapter examines literature focused on technology integration and applies it as a lens for understanding and critiquing technology integration trends and opportunities towards more equitable technology integration in elementary education.

Technology is integrated into teaching and learning in vast and disparate ways across and through historical, philosophical, political and social practices in elementary schooling. Inequality in education reflects inequality in society. Historically, the proliferation of technology in schooling has often been perceived as the cure-all for the legacy of inequity in education and society (Gherardi, 2016; Selwyn, Gorard & Williams, 2001). Until recently, the proliferation of technology in schools has most often been done without the explicit, or implied, situating of technology integration understandings and underpinnings through a critical lens. This review of literature (re)positions the integration of technology to embrace equitable uses across social systems. The rationale

for this (re)positioning expands upon the work of earlier technology integration initiatives, researchers, organizations and government/policy makers.

Technology Integration: Historical Underpinnings and Understandings

Few of the innovations tried of the ensuing 25 years
have resulted in large scale systematic change in education.
Despite the revolutions wrought by technology
in medicine, engineering, communications, and many other fields,
the classrooms, textbooks, and lectures of today
are little different than those of our parents.
Yet today's students use computers, mobile telephones,
and other portable technical devices regularly
for almost every form of communication except learning.
National Science Foundation, 2008, p. 12

If systematic change in education is partially sought with and through the use of technologies, it is valuable to understand the history of the field in order to strategize next steps. Going back several decades, research is readily found archiving each significant innovation, and often their failures, to transform teaching and learning (Cuban, 1986; Hannafin & Savenye, 1993). From educational use of radio broadcasting in the late 1920s (The American School of the Air, 1930) to the use of education-focused television channels in the 1950s (Morehead, 1955) to computer-assisted instruction in the 1960s (Reiser, 2001) to the first Apple computer entering the education market in the 1970s, along with microcomputers serving as an affordable and compact tool for K-12 instruction (Center for Social Organization of Schools, 1983), each of these technological advancements have influenced teaching and learning practices. In the mid-1990s there was an influx of investment in funding for educational technology infrastructure (i.e. computers, peripherals, network connections) (Anderson & Becker, 2010) and a call for

networked classrooms, curriculum embedded software, well-trained teachers and for computers to become accessible for all learners (American Presidency Project, 1996).

Education has made considerable strides with regard to technology integration, yet, despite these technological revolution efforts in schools, pedagogical practices appeared the same as they did prior to the introduction of computers and Internet (Christensen, Horn & Johnson, 2008). For instance, word processing and drill-and-practice software applications held steady as the most common approaches of technology integration in elementary classrooms through the 1990s (Becker, 1983; Becker & Ravitz, 1999). Despite extensive educational funding being funneled into technologies, a paradigm shift in practice was necessary to understand the potential of technology to transform educational practices. There is a beginning of this shift in the research between the 1980s and the 1990s as attention to the computer's role in education refocused to the educator's role in using technology within instruction. Educators' relationship with the technologies, and how this relationship informs their teaching practice, was under-researched as an avenue to improve technology integration. To demonstrate, Shaw (2000) reports that in an investment of $313 billion dollars (0.1%) by the United States government on K-12 public education was allocated to research teaching practices with educational technologies to improve instruction.

Technology integration research has further been exacerbated due to the rate in which technological advancements occur. Technologies have become more readily available, intuitively useful and relatively affordable for many people since the turn of the century. Technology impacts almost every aspect of our daily lives in the United States;

K-12 education is also included in this technological landscape. Many classrooms are equipped with technologies ranging from electronic mail, multimedia authoring, and online databases to interactive whiteboards, videoconferencing, high speed Internet access and wireless handheld devices (Mollison, 2004; White, 2004). The Internet is now conceived of as a basic platform for voice, video and audio in which social networking, podcasting and blogging technologies may be used within K-12 teaching and learning (Chapman, 2000). Mishra and Koehler (2006) suggest that educators are generally expected to integrate technological knowledge into instruction in order to positively influence student learning. Angeli and Valanides (2009) remind us of the importance in understanding the ways in which technology can be used innovatively to transform teaching practices and generate new opportunities for learning so that we can avoid replicating historical outcomes. In addition, if the societal factors impacting K-12 technology integration are not explored, we may find ourselves battling the same technology integration issues related to ineffective technology uses with the only changes being the types of tools used and the date on the calendar. Armfield (2016) declares, "focusing solely on how, why, and when to use technology in the learning environments excludes the development of understandings about the technologies themselves and how they remove or extend social structures both inside and outside the classroom" (p. 110). As a result, how the technology (i.e. radio, television, computers, Internet, handheld touchscreen devices, augmented reality goggles) is used by educators and learners is one of the areas in which researchers can name the influential social practices, in both classrooms and communities, and work towards more equitable social inclusion.

Influence of Societal Factors on K-12 Technology Integration

Technology integration is prioritized and shape-shifted by both oft-cited and uninterrogated societal factors. Framing technology integration societal factors as issues and opportunities in education affords the ability to identify some spaces where social inequalities are present in schooling practices. These spaces of social inequalities are used to illuminate how technology integration as a social issue is employed in this dissertation research.

Oft-cited societal factors. It is common for the rationale for technology integration in education to be linked to social needs. For example, a report on early childhood education recommended that educators must focus on teaching and learning processes within technology integration in order to ensure societal needs, including the economic growth of the nation (Committee for Economic Development, 2004). Molner (1997) highlighted the common perception that the purpose of education is to indoctrinate children within the dominant culture and prepare youth for 'the real world' [the nation's workforce]. Societal factors in schools are further privileged when technological knowledge is deemed as essential for participation in a global marketplace (Goddard, 2002) by using research illustrating labor shortages in positions with these skills (George, Neale, Van Horne & Malcom, 2001). Consequently, workforce pressures combined with technology innovation rates influence K-12 technology integration educational policy (McKenzie, 2000). Legislation provisions, such as those ensuring teachers can integrate technology into the curriculum in order to improve students' achievement in the No Child Left Behind Act (United States Department of Education, 2001; 2007), indicate a firm

commitment to the expansion and use of technologies in K-12 classrooms (Ertmer, 2005).

In a similar manner, national policies make commitments to the use of technologies in

education (e.g. 2017 National Education Technology Plan Update by the Office of

Educational Technology). To illustrate, President Obama's State of the Union Address in

2016 suggested offering computer science to every K-12 student; "*Computer Science for*

All is the President [Obama]'s bold new initiative to empower all American students from

kindergarten through high school to learn computer science and be equipped with the

computational thinking skills they need to be creators in the digital economy, not just

consumers, and to be active citizens in our technology-driven world" (Smith, 2016).

While technology integration cannot solve all of the challenges and crises we face,

societal factors that are widely acknowledged (e.g. economic growth, workforce and

global competition needs) often are addressed through formal legislation and positioned

as the responsibility of K-12 education. Yet, by focusing on these public driving forces

for technology integration in K-12 education, deeper uninterrogated societal factors are

often overlooked.

      Uninterrogated societal factors. Identifying and interrogating societal factors

created and perpetuated by human social systems (i.e. power, positioning and privilege)

is a challenge because they are often absent within the technology integration literature.

Drawing upon Kincheloe's 2007 work, Porfilio (2016) suggests:

> Even when scholars, educators, and administrators hold the critical insight to
> recognize that technology is likely to reproduce existing relationships of power
> because it is situated in an economic system bent on maximizing profits for
> corporate leaders as well as folded into webs of social relations where power is
> asymmetrically concentrated along lines of race, class, gender, and (dis)ability,
> they generally fail to produce a body of scholarship that unveils how technology

impacts our subjectivity, the environment, and relationships inside of schools. (p. vii)

In short, Porfilio urges us to interrogate our assumptions and understandings of the impact of technology use in social relations. By questioning historical initiatives through social systems of power, we may be better positioned to address issues of practice and privilege.

For example, President Clinton's 1996 State of the Union address called for accessible computers and networked classrooms in K-12 education. Subsequently, the administration approved an E-rate program which funded low socioeconomic areas with networked Internet (Federal Communication Commission, 1999). Thus, one might ask: How was *accessible* defined across all communities? What assumptions were made regarding technology's influence on the agency of the community members in a networked classroom? How was technology integrated to position student contributions in critical social engagement? Who created this technology integration program proposal, and what experiences were included/excluded? In this program, which drove technology initiatives in the late 1990s, what perspectives, practices and/or people were centered (or marginalized)? This type of questioning may help reveal the underlying assumptions and understandings around the integration of technology in education. Making visible who profits and where power is concentrated unveils some of the ways in which technology impacts our subjectivity, environment and relationships in and outside of schools. Likewise, Gherardi (2016) calls for new questions to be asked which "focus on the social context of technology and technology-based reforms" (p. 179). Weston and Bain (2010) suggest that technology integration initiatives themselves must change.

They believe initiatives hold the power to disrupt the status quo in schools through (re)visioning the long-standing equilibrium of educational practices, roles and relationships amongst teachers, students and technology in classrooms. By focusing on the social relations of technology integration, as a society we may work towards social inclusion for the greater good.

Several scholars engage in critical technology integration research. For instance, Warshauer (2000, 2004), Araque et al. (2013), and Valadez and Duran (2007) have conducted critical explorations of technology integration that address social divisions. Specifically, Warschauer (2004) interrogated educational technology use as a perpetuation of social inequities thereby making visible the connections between students' socioeconomic/linguistic backgrounds and technology integration strategies (e.g. when low-level technology integration practices, such as drill-and-practice, are the primary learning opportunities for low socioeconomic communities). Other foci of critical perspectives of technology integration discuss hidden curriculum and marginalization. Blikstein (2008) names the hidden curriculum in low-level technology integration practices:

> The traditional use of technology in schools contains its own hidden curriculum. It surreptitiously fosters students who are consumers of software and not constructors; adapt to the machine and not reinvent it; and accept the computer as a black box which only specialists can understand, program, or repair. For the most part, these passive uses of technologies include unidirectional access to information (the computer as the electronic library), communicate with other people (the computer as a telephone), and propagate information to others (the computer as a blackboard or newspaper). (p. 5)

It is the hidden factors of technology uses in schools that reify those in positions of (and

social systems of) power. While technology integration may perpetuate

disenfranchisement, there is space to provoke social change. Miller (2016) suggests:

> Just as quickly as technology can extend democratic opportunities, it can also
> silence groups and continue marginalization or oppression… However, when used
> deliberately, digital technologies such as computers, social media, digital video,
> and digital photography can play a central role in democratic education and
> education for social justice. These technologies are versatile and can lead to
> multifaceted ways of communicating, engaging inquiry, asking critical questions,
> and conveying ideas. (p. 20)

One of the most dominant narratives about the purpose of integrating technology into

teaching and learning is to foster economic growth by developing a skilled workforce

prepared to lead our nation in global competition. While these societal factors are

valuable, they neglect to address the imperfect and dynamic world in which we live. To

this end, Miller's claim recognizes the humanizing elements of technology which

incorporate social change as an encompassing element within the purpose of technology

integration in education. Miller positions a technology integration stance which promotes

the critical interrogation of status quo for the well-being of the community. This stance

should be relevant to all who work within and care about education and our society.

Defining Technology Integration in this Research

The term "technology integration" is often employed without a concise or normed

definition (Bebell, Russell, & O'Dwyer, 2004; Belland, 2009; Hew & Brush, 2007).

According to The National Center for Education Statistics (NCES), "many groups have

struggled to clarify the issue of defining technology integration" (United States

Department of Education, 2003, p. 75). The words *technology, learning, instruction,*

incorporation, use, improve, practices, and *pedagogy* - including combinations thereof - are frequently utilized in technology integration definitions and understandings. Concepts that are commonly privileged in one definition may be in tension with how other concepts are understood. These tensions are where the possibilities are in informing a more critical conception of technology integration, which is one of the purposes of this dissertation. Therefore, an exploration of the ways in which technology integration has historically been defined, understood and applied in scholarship, policy, and practice is necessary.

One of the seminal understandings in using technology in education is Jonassen's (1996) constructivist view. He categorized student interactions with technology as learning *about*, learning *from,* or learning *with* technology. This definition positions technology as a thinking tool that fosters meaningful learning. During the 1990s, Jonassen's conceptualization was unique in that it negated technology euphoria and hinted at relational aspects of learning. Two decades later, the United States Department of Education via the Office of Educational Technology (OET)[11] (2017) offered a statement that technology is a powerful tool to support teachers. While this statement is vague and lacks any mention of learners, the office did identify resources to support educators' transition to using technology and collaborating with other educators.

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[11] OET outlines a national vision for transformative teaching and learning with technology. They support professional learning at the state and district levels. In addition, OET collaborates with federal agencies on educational technology issues, and while much of their work guides national policy, they do also develop national policies.

The National Council of Educational Statistics (NCES) defines technology integration as, "the incorporation of technology resources and technology-based practices into the daily routines, work, and management of organizations" (2005, Part 8)[12]. NCES does observe that this definition is insufficient in articulating advantageous technology integration (National Council of Educational Statistics, 2002). NCES considers the role of context in technology integration practices which impacts student learning.

Earle's (2002) conceptualization of technology integration is more comprehensive than NCES' or Jonassen's (1996) ideas. Earle noted that technology is comprised of the tools to deliver content and improve practices, and that integration is defined by the how and why of the technology use:

> Definitions of both terms (technology and integration), whether broad or limited, drive the problem… Integration does not just mean placement of hardware in classrooms… Technologies must be pedagogically sound. They must go beyond information retrieval to problem solving; allow new instructional and learning experiences not possible without them; promote deep processing of ideas; increase student interaction with subject matter; promote faculty and student enthusiasm for teaching and learning; and free up time for quality classroom interaction—in sum, improve the pedagogy. (2002, p. 10)

For Earle, technology is not an isolated tool, rather she privileged the pedagogical design of what teachers and students may accomplish through the use of the technology. This rendering of technology integration builds upon Jonassen's vision of learning *with* technology in authentic learning, as *technology-enabled learning* - an understanding that places further emphasis on pedagogy rather than a simple infusion and presence of tools.

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[12] NCES continues to conduct research on education technology in U.S. public schools post 2005 (e.g. 2008, 2010); however, more recent reports/chapters do not specify how the national center defines technology integration. It is assumed the 2005 definition remains in effect.

In this conception, technology-enabled learning leveraged the technology within a system that both influences, and is influenced by, the educators as social actors (Ertmer & Ottenbreit, 2013). Earle's (2002) reconciliation of the terms "technology" and "integration" situated pedagogy as a driving factor. Identifying the importance of pedagogy when teaching with technology is not a new conception. For example, Jonassen (1996) suggested that teachers should engage students in learning utilizing technology. Likewise, Ertmer and Ottenbreit (2013) expanded conceptions of technology integration to privilege pedagogy. Ertmer and Ottenbreit's (2013) conceptions highlighted social systems as playing a key role in pedagogical aspects of K-12 technology integration, particularly in changing historically-situated teaching practices.

Building upon these seminal definitions and understandings, an updated understanding of technology integration which clarifies conceptualizations of equity issues around technology use as a social issue is used for this dissertation. The rationale for an updated understanding honors critical examinations of teaching argued by Freire (2000) when he stated that people must be prepared to "perceive social, political, and economic contradictions, and to take action against the oppressive elements of reality" (p. 35). For those who engage in equity work within the field of education, new approaches to teaching and learning with technology positions all learners to become equitably enfranchised members of society (Armfield, 2016). Therefore, my understanding of technology integration begins with the following commitments:

- Power operates in relationships among teachers, students, and technology in social systems;

- Technology integration is positioned as part of the work of teaching - it is not an 'add on' to pedagogy and/or practice, it is an integral element of the daily expectations of education work;
- The privileged ways technology is used impacts people, learning and society;
- Technology integration should be situated within learning environments in the same way as culturally relevant pedagogies and practices;
- The use of technology is leveraged as a means for both learning and social change. This is a substantial shift from use of technology for efficiency in academic achievement and for societal factors such as economics, workforce and global competition and shifts the motivations for learning into social participation and action; and
- Technology integration practices are critical in that they interrogate social factors of technology use (power, positioning and privilege) while influencing social action.

For these reasons, this conceptualization of technology integration, which is situated in equitable education practices, guides my dissertation research: *Technology integration encompasses how practices using technology are leveraged in educational contexts to impact people, learning and society through the relationships among educators, learners and the technologies to produce social change.*

Social relations are embedded in both the commitments and definition of technology integration reaching beyond techno-centric understandings to embrace humanizing uses across social systems. Although incorporating aspects of 'social' in the

definition and understanding of technology integration may seem inconsequential, it is in fact essential in terms of humanizing the use of technology in schools. Instead of a techno-centric focus, this updated technology integration definition urges educators to consider the relationships with people, technologies and social systems while leveraging what is made possible through this unity.

      Factors influencing technology integration. There are many factors that influence technology integration in K-12 schools. The following ideas are cited as leading reasons that hinder meaningful technology integration in K-12 teaching and learning. Regardless of the local, national, or international contexts, educators across diverse school community contexts experience multiple, often intersecting barriers in integrating technology into teaching and learning. To exemplify this reality, the following factors are often identified and investigated in the literature (2000-2017):

- *Access* (including hardware, software, Internet, device maintenance) (Bauer & Kenton, 2005; Becker, 2000; Kay, 2006; Pelgrum, 2001)

- *Administration, school systems and support* (Bauer & Kenton, 2005; Clark & Estes, 2008; Grove, Strudler & Odell, 2004; Leonard & Leonard, 2006; Marx, Blumenfeld, Krajcik, Fishman, Soloway, Geier & Tal, 2004; Pelgrum, 2001; Rogers, 2001; Ronnkvist, Dexter & Anderson, 2000; Staples, Pugach & Himes, 2005; Verdugo & Belmonte, 2007; Zhao & Frank, 2003)

- *Educator beliefs and attitudes* (Becker, 2000; Christensen, 2002; Ertmer, 2005, 2005; Hazzan, 2003; Judson, 2006; Watson, 2006)

- *Pedagogy and practices* (Adams, 2007; Becker, 2000; Christensen et al., 2008; FitzPatrick, 2001; Hazzen, 2003; Livingston & Condie, 2006; Palak & Walls, 2009; Rosen, Cheever & Carrier, 2010)

- *Professional development* (Abbott & Faris, 2000; Bauer, Reese & McAllister, 2003; Christensen, 2002; Davis & Eslinger, 2001; Kanaya, Light & Culp, 2005; Marx et al., 2004; Guha, 2001; Pelgrum, 2001; Schneiderman, 2004; Smerdon et al., 2000; Staples et al., 2005)

- *Teacher knowledge* (Becker, 2000; Clark & Estes, 2008; Pelgrum, 2001; Roschelle, Pea, Hoadley, Gordin & Means, 2001; Rosen et al., 2010; Ward & Parr, 2010; Watson, 2006)

- *Time* (Bauer & Kenton, 2005; Pelgrum, 2001; McCrory Wallace, Kupperman, Krajcik & Soloway, 2000; Schneiderman, 2004; Zhao & Frank, 2003)

It is important for these factors to be both understood and addressed as they impede student learning and perpetuate the sluggish integration of technology in K-12 schools. In addition, it is significant to both the fields of learning technologies and elementary education for scholars to continue inquiries into these factors with aim to facilitate corrective action. However, for the purposes and relevancy of this research, the three most noteworthy factors of technology integration are discussed further: pedagogies and practices, educator beliefs and professional learning.

Technology integration pedagogies and practices. Considering the human-centered nature of learning, it is pertinent to explore what is pedagogically necessary to support technology integration. Pedagogy includes both the method and practice of

teaching. Pedagogy, and the practice thereof, is comprised of learning activity design, delivery, dialogue and assessment as they are informed by educators' epistemologies, learning theories, beliefs and knowledge commitments. Educators' personal epistemologies, which are beliefs about the nature of knowledge and knowing (Chan & Elliott, 2004; Hofer, 2001; Schommer, 1994), impact views about learning and pedagogical commitments that drive teaching practices. Pedagogy is both the science and the art of teaching[13] (Shulman, 1987). The why (pedagogy) and how (practices) of teaching are interconnected and influence one another. These terms will occasionally be used interchangeably in this dissertation as they are within the literature.

Pedagogical issues are identified as a gap in technology integration practices in a review of technology integration literature (Franklin & Bolick, 2007). For example, FitzPatrick (2001) found students sought to readily assume new roles when learning with technology. This enthusiasm, however, was tempered. The lack of evolution in instructional practices by educators inhibited the pedagogical shifts students desired. The affordances of technology can position students with new level of agency in their learning; yet, educators' comfort with technologies and educators' desire for control affect how technology is utilized in classroom practices.

Educator perceptions and beliefs about technology greatly influence the integration of technology into pedagogy and the learning processes (Buabeng-Andoh, 2012; Hew & Brush, 2007; Huang & Liaw, 2005; Keengwe & Onchwari, 2009). This

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[13] The art of teaching is the intuitive, responsive and creative aspects, whereas the science of teaching is considered the research-informed decision-making with theoretical underpinnings - both of which are based in ethical commitments.

dissertation applies beliefs about technology as an influence on pedagogies and practices in a fashion similar to Okojie, Olinzock and Okojie-Boulder's (2006) research. Their research situates pedagogy in relationship with technology - they are woven together in both pedagogical processes and practices. Okojie et al. (2006) states, "Technology which is used to facilitate learning, is part of the instructional process and not an appendage to be attached at any convenient stage during the course of the instruction" (p. 67). Okojie et al. asserts that technology is a part of, infused within, the teaching and learning process, in which technology is interconnected with the humans and classroom practices in order to enhance students' engagement and learning as well as educators' pedagogical practices.

An interconnected pedagogical approach of technology integration that weaves together beliefs and practices does not occur by happenstance. A common critique of technology integration is that no pedagogical shift occurs where educators use technology as an appendage to their existing practices (Cuban, 2001; Cuban, Kirkpatrick & Peck, 2001). Based on research conducted on computer use in the classroom Cuban (2001) observed, "No [educational] revolution had occurred… if anything teachers have only adopted the computers [technologies] to existing methods of classroom practices" (p. 185). Similarly, Palak and Walls (2009) identified no pedagogical shift in educators' teacher-centered practices when integrating technology due to educators' beliefs about good teaching. Even when teachers were sufficiently supported in a technology-rich school environment and held positive attitudes towards technology integration, teacher-centered pedagogy remained common in classrooms. In addition, Ertmer and Ottenbreit-

Leftwich (2010) found that basic knowledge of technology is not sufficient to enact

pedagogies and practices that effectively integrate technologies in the classroom:

> [Simply] *knowing how* to use a piece of hardware (e.g. digital camera, science
> probe) and software application (e.g. presentation tool, social networking site) is
> not enough to enable teachers to use the technology effectively in the classroom.
> In fact, if this were true, there'd be little, if any, gap between teachers' personal
> and instructional uses of technology. But knowing how to use the tools is only
> the foundation. Teaching with technology requires teachers to expand their
> knowledge of pedagogical practices across multiple aspects of the planning,
> implementation, and evaluation processes. (p. 260)

Christensen et al. (2008) described technology in scenarios like these to be a

sustaining innovation - one in which the technology is used to fit the existing processes,

practices, and pedagogies of the organization (i.e. classrooms and schools). To this end,

Newman's (1990) recommendation which advocated for technology to be integrated with

the intention of disrupting the educational environment is still relevant today in order for

teaching and learning to be fundamentally altered.

To date, the literature indicates that a primary issue in technology integration is

pedagogical in nature. Positioning technology integration pedagogies and practices as

primarily about the teaching is problematic; it centers the teacher, and by default their

actions, which privileges the educator over the learner. If we can, instead, privilege

relationships, and refocus these traditions of thinking and practice as one of the ways in

which educators act *with* their learners, rather than *on* their learners, we may minimize

techno-centric pedagogies and practices. Thus, the art and science of teaching are

considered to be ways in which we care for and care about social relations in technology

integration.

Technology integration teacher beliefs. Buabeng-Andoh (2012) suggested that institutional, technological and personal factors are interrelated as they influence educators' technology integration practices and beliefs. First, the ways in which teacher beliefs are understood and operate when integrating technology into teaching and learning are identified. Beliefs are then conceptualized as being in a relationship with technology integration practices through their significant influence on the perceived roles of teachers and students. Next, popular categorizations of teacher beliefs as barriers in technology integration are articulated. Finally, a proposal to advance the field is offered.

Substantial research has focused on teacher beliefs, and scholars use different terminology in their conceptualizations and research such as "attitudes, values, judgements, axioms, opinions, ideology, perceptions, conceptions, conceptual systems, preconceptions, dispositions, implicit theories, explicit theories, personal theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, repertories of understanding, and social strategy" (Pajares, 1992, p.309). Regardless of the term, teacher beliefs may be understood as "any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase, I believe that…" (Rokeach, 1968, p. 113). Importantly, teacher beliefs are not simply something one has inside their heads; they operate and can become visible through day-to-day actions in classrooms. Beliefs are one factor in teachers' instructional decision-making actions and relationships which help educators make sense of their roles, commitments, pedagogies and practices (Beijaard, Meijer & Verloop, 2004; Coldron & Smith, 1999). Scholarship that examines the strong influence of

educator beliefs on technology integration pedagogies and practices is relevant to this study.

Teachers' awareness of their beliefs is linked to and can generate agency that empowers transformation of practice (Day, Kington, Stobart & Sammons, 2006; Parkison, 2008; Sfard & Prusak, 2005); in which case, teacher beliefs are both the process and product which can undergo reinvention (Mitchell & Weber, 1999). For example, Lowther, Inan, Ross and Strahl (2012) found that "teachers who have higher technical skills and hold positive beliefs and readiness are more likely to integrate computers [technologies] into classroom instruction" (p. 23). These conclusions are an example of where technology integration is both process and product, where the process of acquiring technological knowledge developed into the product of positive beliefs regarding technology. Then, the product of teachers' positive beliefs about technology in education influenced the process of integrating technology into their classroom instruction, at which point the act of technology integration became a product that informed teacher beliefs about teaching and learning with technology. Hence, teacher beliefs underwent a constant reinvention as a process and product when they integrated technology into their classrooms.

Many scholars convey teachers' beliefs as playing a significant role in meaningful technology integration practices (Ertmer & Ottenbreit-Leftwich, 2013; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012; Hew & Brush, 2007). As an illustration, one survey of 764 elementary and secondary teachers found an influential predictor of teachers' technology use was exuding confidence they could achieve

instructional goals using technology (Wozney, Venkatesh, & Abrami, 2006). In addition, Bauer and Kenton's (2005) study with thirty 'tech-savvy' educators found that even with technological knowledge, educators' (low) confidence barriers inhibited successful technology integration. In other words, educators' self-efficacy beliefs play a significant role in technology integration. If educators do not feel confident using their own technology knowledge to facilitate student learning with technology, their beliefs become a barrier to technology integration pedagogies and practices.

Other scholars conceptualize teacher beliefs as being in relationship with technology integration practices. There has been an increased interest in studying the relationship between teachers' beliefs and their technology integration practices (Ertmer & Ottenbreit-Leftwich, 2010; Inan & Lowther, 2010; Kim, Kim, Lee, Spector, & DeMeester, 2013; Ottenbreit-Leftwich et al., 2010; Shifflet & Weilbacher, 2015). For example, Judson (2006) compared thirty-two elementary and secondary educators' beliefs with their practices integrating technology. The findings indicate a relationship between the teachers' instructional beliefs and how they integrated technology; specifically, if a teacher held positive beliefs about technology they employed a wide array of practices integrating technology. Another example is Ertmer et al.'s (2012) examination of the relationship between teaching beliefs with integration practices in twelve technology-using educators. They found the technology integration practices to be closely aligned with the educator's teaching beliefs; in particular, educators operating with student-centered beliefs tended to use technology in more interactive and collaborative ways.

Identifying external and internal barriers to technology integration was introduced by Brickner (1995) in an unpublished doctoral dissertation. Barriers as a concept became a useful way to understand and research issues surrounding technology integration with Ertmer (1999) and Ertmer et al.'s (2012) seminal scholarship. External barriers, coined first-order barriers, are the factors outside of the teacher's control which influence technology integration (i.e. access to reliable technology devices and Internet, administration/school systems and support, pace of technology advancements, student skill level, time) (Ertmer, 1999). Whereas, internal barriers, coined second-order barriers, are conceptualized as the 'true gatekeepers' of technology integration (Ertmer, Addison, Lane, Ross & Woods, 1999). Internal barriers are beliefs about technology and its value, teaching pedagogies and practice, confidence, and the purpose of integrating technologies into the classroom. Ertmer et al. (1999) and Ertmer's (2005) research indicates a connection between what teachers believe and how they enact those beliefs about technology integration.

Teacher beliefs are a strong predictor of technology integration behavior that has been confirmed by many studies (e.g. Ertmer & Ottenbreit-Leftwich, 2010; Inan & Lowther, 2010; Kim, Kim, Lee, Spector, & DeMeester, 2013; Ottenbreit-Leftwich et al., 2010; Shifflet & Weilbacher, 2015). For example, Inan and Lowther (2010) found teacher beliefs, in particular the perceived values of technology in learning, strongly predicted the integration of technology integration. Yet, deviation between teacher beliefs and technology integration pedagogies and practices are reported in other studies. For instance, Shifflet and Weilbacher's (2015) findings note disparities between teachers'

beliefs and technology integration practices, concluding that teachers' student-centered beliefs were not powerful enough to overcome the perceived barriers of integrating technology.

Teacher beliefs are one of many factors that hinder or enhance technology integration in K-12 teaching and learning. With this in mind, it is constructive to explore the relationship of teacher beliefs with successful technology integration. Christensen's (2002) study on elementary teacher beliefs as they operate within the day-to-day classroom actions provides an intriguing angle compared to other technology integration research. The findings of this study highlight the influence of educators' beliefs about technology on learners' attitudes towards technology use. Christensen (2002) found that as teachers' beliefs and skill with technology integration increases, students' educational use of educational technology grows. As student use of technology for educational purposes grows, a teacher's willingness to implement technologies increases - essentially creating a feedback loop for technology implementation. This conclusion reiterates the importance of humanizing technology use in schools. If teachers' beliefs have a direct impact on students' relationships with technology usage, then there is a need for technology integration understandings to reach beyond techno-centric conceptions and explicitly name humanizing uses across schooling and social systems.

This review of literature subsection identified teacher beliefs as one way to conceptualize technology integration factors operating in K-12 classrooms. Pajares (1992) described teacher beliefs as a *messy construct*. Indeed, teacher beliefs are contextually-situated and as Ertmer (1999) noted, "it is generally acknowledged that first-

order barriers [external] can be significant obstacles to achieving technology integration, yet the relative strength of second-order barriers [internal] may reduce or magnify their effects" (p. 53). Teacher beliefs are a primary factor influencing technology integration practice and the synergistic relationship among beliefs and practices continues to be explored in research. Moreover, given the impact of educator beliefs on learner beliefs, it is through the articulation of beliefs that teachers and scholars can explicitly engage with humanizing uses of technology.

Technology integration professional learning. Technology has mostly failed to be fully leveraged within educational contexts to produce social change, which may be in part due to ineffective teacher professional development (Duran, Brunvand, Ellsworth & Sendag, 2011; Lawless & Pellegrino, 2007; Liao, Ottenbreit-Leftwich, Karlin, Glazewski & Brush, 2016; Project Tomorrow, 2013). Yet, there is promise. An international scholar, Villegas-Reimers, noted:

> ... many societies are engaging in serious and promising educational reforms. One of the key elements in most of these reforms is the professional development of teachers; societies are finally acknowledging that teachers are not only one of the 'variables' that need to be changed in order to improve their education systems, but they are also the most significant change agents in these reforms. This double role of teachers in educational reforms - being both subjects and objects of change - make the field of teacher professional development a growing and challenging area... (2003, p. 7)

Positioning teachers as vital in educational reform, specifically in the context of technology integration, situates professional development as a key factor in social change.

Professional development is broadly defined as formal experiences (i.e. workshops, conferences, professional meetings, mentoring) and informal experiences (i.e.

academic reading, Professional Learning Network (PLN) Twitter chats, watching

academic documentaries) to help improve teacher efficacy (Ganser, 2000; Villegas-

Reimers, 2003). Ultimately, professional development, whether formal or informal,

seeks to address professionals' practices and beliefs. Within the field of K-12 education,

Glatthorn (1995) defines teacher professional development as, "the professional growth a

teacher achieves as a result of gaining increased experience and examining his or her

teaching systematically" (p. 41). Professional development experiences have begun to

transition from short-term isolated 'sit and get' experiences to long-term ongoing

processes in order to better support teacher growth (Cochran-Smith & Lytle, 2001;

Ganser, 2000; Walling & Lewis, 2000; Villegas-Reimers, 2003). Lawless and Pellegrino

(2007) share long-term visions for technology integration-related professional

development trends across federal, state and local education agencies, professional

organizations and institutions of higher education:

> [O]ver the past decade, the federal government has invested heavily in numerous
> initiatives to assure that schools keep pace with technology developments. These
> initiatives include (a) improving the capacity of schools to use technology, (b)
> training the next generation of teachers to use technology in their classrooms, (c)
> retraining the current teaching workforce in the use of technology-based
> instructional tactics, and (d) minimizing inequitable access to technology."
> (Lawless & Pellegrino, 2007, p. 576)

Notably, educators' dissatisfaction with professional development initiatives focused on

technology integration are similar to other professional development initiatives (Darling-

Hammond, Wei, Andree, Richardson & Orphanos, 2009). Educators seek depth and

coherence with direct links to classroom practice in professional development

experiences (Darling-Hammond et al., 2009) so they may leverage technology to improve

student learning (Garet, Porter, Desimone, Birman & Yoon, 2001). To this end, Sell, Cornelius-White, Chang, McLean & Roworth's (2012) found that "professional development will be more successful if it addresses teacher beliefs about instruction and technology, includes relevant hands-on training, [and] involves collaborative or cooperative learning among teachers" (p. 28). In other words, meaningful professional development about technology integration is a multifaceted process which works across practical technological applications, beliefs, pedagogies, classroom practices in contextually-relevant and collaborative ways.

Caena's (2011) scholarship on educator professional development builds upon this conception by adding considerations of time and patience; "Meaningful learning is a slow and uncertain process for teachers as well as for students, with some elements that are more easily changed than others, according to the interplay with teachers' deeply-rooted beliefs and attitudes" (p.9). If the relationship between beliefs about teaching and learning to classroom practices is not a component of professional development, educators are dissatisfied. For this reason, Ward and Parr (2010) suggest professional development aims should move beyond technological skill development to address beliefs and pedagogies, which is where educators' understandings evolve related to the benefits of technology integration. Proponents of these professional development approaches argue for the interconnectedness of technological knowledge and pedagogical beliefs and practices; however, they overlook underlying assumptions of professional development.

Typically, the intent of professional development is to develop professionals' perceived deficiencies in distinctive areas (often knowledge, competence, strategies/skills, and performance effectiveness) through the assumption professionals require external direction to 'fill up' with knowledge (Webster-Wright, 2009). This assumption positions professionals as passive consumers of knowledge and practices, which are often informed by administration's beliefs and pedagogies. One way to disrupt this deficiency discourse and position professionals as engaged learners is to shift terminology from professional development to *professional learning* (Webster-Wright, 2009)[14]. Webster-Wright (2009) notes literature across disciplines reveals most professionals strive to learn and improve their practice. Therefore, shifting the discourse from a deficit model of professional development to an asset-building model of professional learning may spark a sense of agency in educators to take on active roles in the knowledge construction process and applications to their practice. Valenzuela (2010) refers to this shift as fostering an additive asset-building mindset rather than a subtractive deficit-filling discourse. If educators are enthusiastically striving to improve their practice, then professional learning can transform teaching practices and commitments leading the changes in professional practices. In this dissertation I position educators as capable and willing learners with agency to shape technology integration practices in their environments.

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[14] Webster-Wright's (2009) indicates formal professional development and authentic day-to-day professional learning are treated separately in literature (Alsop, 2000; Beckett & Hager, 2002; Day, 1999, Jarvis, 2004). She employs the term *continuing professional learning* to encompass a combination of professional learning experiences (e.g. life experiences, collegial interactions, formalized professional development). In this research I draw upon Webster-Wright's positioning of professionals as inquiring social beings who learn from vast "combinations and permutations of experiences" (p. 705).

Teaching is a social practice (Caena, 2011); technology integration professional learning should be context relevant (Lawless & Pellegrino, 2007) as social systems are woven across and through the integration of technology in teaching and learning. Twinning, Raffaghelli, Albion and Knezek (2013) emphasize technology integration professional learning experiences should be under constant investigation of educators' perceptions and needs and be responsive in support across levels - individual teachers to school systems. In order to enact technology integration within social system such as schools, a process orientation to professional learning that works with the interactions of technology integration factors and pedagogy is productive (Ertmer et al., 2012; Ertmer & Ottenbreit-Leftwich, 2013; Mouza, 2011).

In this dissertation, I advance Webster-Wright's (2009) conceptualization of professional development as the path for professional growth to professional learning as an asset-building approach which provides educators with agency to (re)shape technology integration practices. I also highlight the relevance and prominence of social aspects in teaching and learning with technologies and urge the extension of social contexts into technology integration scholarship and practices in order to address social issues within education.

Summary of Technology Integration Review of Literature

The persistent historical trend across decades of literature is that increasing the volume of technologies in schools, regardless of the specific technological tool, has not produced a significant impact on K-12 teaching and learning (Anderson & Ronnkvist, 1999; Cuban, 2001; Norris, et al., 2003). Cassidy (1998) forwards a powerful claim that

it is not enough for educators to utilize the flashy new technology; alternatively, educators must work against the societal factors (i.e. school systems, economic and political forces, professional beliefs) to produce different technology integration results. Specifically, societal factors, when combined with technology integration practices in K-12 education, may bolster or reinforce social inequities (Araque et al., 2013); consequently, the integration of technologies in classrooms and schools is an equity issue (Wiske, 2004).

Chapter 3: The Digital Divides and Technology Integration

"[Educational technology] literature is important and abundant,
but it portrays educational technology and social justice as paradoxical
and working against or in spite of each other.
This antithetical depiction is not absolute;
it does not capture the efforts of K-12 students who utilize technology
to liberate themselves and challenge oppressive forces, including dominant discourse."

- Dr. Libbi Miller, Daniel Becker and Dr. Katherine Becker in *Technology for Transformation: Perspectives of Hope in the Digital Age* (2016, p. xiii-xiv)

This chapter builds on the review of literature in the previous chapter, focusing on digital divides and participatory technology integration. The conceptions of digital divides and participatory practices in technology integration are applied in this dissertation research as a way to promote more equitable technology integration in elementary education.

The Digital Divides

"To be conscious that you are ignorant is a great step to knowledge."

- Benjamin Disraeli

It is through educators' consciousness of the digital divides that equity-based technology integration practices may be enacted. Technology is "intertwined with education, politics, economics, and culture" (Franklin & Bolick, 2007, p. 34) in ways that inevitably and inequitably impact learners. To this end, literature addressing the digital divides is explored and informs the ways that developing consciousness in teaching and learning with technology supports equity in education.

Initial Digital Divide. In its most simple and well-known conception, the digital divide refers to the unequal access of digital devices and the Internet (Bradbrook & Fisher, 2004; Selwyn, 2003, 2004; Warschauer, 2003). This divide in access to technological tools (e.g. computers, tablets, smartphones) along with infrastructure (e.g. Internet broadband availability, coverage, speeds, capacity, reliability, cost) to support the use of those technological tools materialized as the term, "digital divide," in the 1990s (United Nations, 2013a, 2013b). This initial conception of the digital divide received a lot of attention as a societal concern in the United States as evidenced in national technology documents[15], policies[16] and educational initiatives[17][18]. The initial divide literature is first situated within early 2000s, the time period in which it received national attention.

The digital divide generates lasting consequences in the education of youth. In the early 2000s, Norris, Sullivan, Poirot & Soloway (2003) conducted research with approximately 4,000 K-12 educators across the United States and found a lack of reasonable access to technology to be a significant issue in instruction; nearly 26% of K-

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[15] For instance, ISTE Standards (2018) provide nationally recognized frameworks for students, educators and administrators for digital learning. Additionally, forty-eight states developed Common Core State Standards (CCSS) initiatives which include digital literacies (Common Core State Standards Initiative, 2018).

[16] The National Telecommunications and Information Administration, initiated by the Clinton administration, is an Executive Branch agency which informs programs and policymaking focused on the expansion of ICT (National Telecommunications and Information Administration, 1995, 1998, 1999, 2000; United States Department of Commerce, 2018).

[17] Anderson and Becker (2001) noted during the early 1990s national funding for educational technology infrastructure (i.e. computers, peripherals, network connections) comprised of two-thirds of the federal education budget as an attempt to address the digital divide.

[18] Becker (2000) and Smerdon et al. (2000) concluded by the end of the 1990s ninety-nine percent of public schools connected to the Internet.

12 educators in the U.S. worked in technology-poor environments with access to no more than one computer per classroom. They argue,

> the reason for this non-use lies not at the feet of the teachers, but rather in the very real lack of access to the technology. Having one computer in the classroom is not access, nor will it lead to significant student use. Frankly, technology can't have an impact if children have not had the opportunity to access and use the technology. (Norris et al., 2003, p. 15)

Ultimately, educators cannot integrate technology if the initial digital divide remains a social issue. Although some digital access is marginally better than no digital access, the digital divide has broader, more damaging implications in teaching and learning with technology.

There is a more alarming issue within the initial digital divide - equity. Hart, Allensworth, Lauen & Gladden (2002) reported two distinguishable characteristics affecting digital access in schools; the predominance of Black students and low student achievement levels on standardized assessments. These results were supported by national studies, such as Smerdon, Cronen, Lanahan, Anderson, Iannotti Angeles and Greene's (2000) research along with scholarship by Kleiner & Lewis (2003). To further exemplify the equity issue surrounding disparity in K-12 schools' technology access, Smerdon et al. (2000) indicated that schools located in cities or in the urban fringe were less likely to have similar access to devices and Internet as schools located in suburbs and towns. This evidence supported the notion of inequitable technology access for marginalized communities (Songer, Lee & Kan, 2002), which exasperates the under-serving of particular communities.

Recent data offers a perspective on the progress the United States has made in addressing the initial digital divide. Purcell, Heaps, Buchanan and Friedrich (2013), in research on teachers' use of technology in classrooms and in homes for the PEW Research Center, found striking differences in how technology is used and for what purposes (e.g. accessing content and resources, sharing ideas, interactions with students) when comparing wealthy and poor school districts. Children's lives are impacted when engaging in critical thinking and creative experiences through technology and accessing digital resources are limited by technology access (Armfield, 2016). Gains in addressing the initial digital divide have been made. For example, Horrigan (2015) stated that policy makers and advocates have pushed to reduce barriers for low-income households with school-age children to have access to broadband Internet. The underlying motivation for this advocacy was that low-income students are positioned at a learning disadvantage without online access to do schoolwork (Horrigan, 2015), a disparity in digital access which has been coined the "homework gap" (Anderson, 2017). Nearly one-third of U.S. households with children ages six to seventeen and incomes below $50,000/year do not have Internet connection at home; low-income homes with children are four times more likely to be without broadband Internet than their wealthier counterparts (Horrigan, 2015). More notably, Black and Hispanic low-income households with children trail white low-income households with children by 10% in access to high-speed Internet connection (Perrin, 2017).

Children's lives are further impacted by limited technology access when considering the types of devices they have access to. For instance, Perrin (2017) found

Black people and Hispanic people are more likely than whites to rely on smartphones as the device for Internet access. While smartphone access is a start in bridging the gaps in Internet access, Perrin added that Blacks, Hispanics and lower-income smartphone users are twice as likely to experience cancelled service due to expense. This example illustrates that while the United States has made gains in addressing the initial digital divide since early 2000s, for many learners, differences in types of technology and learning opportunities with technology remain.

The initial digital divide oversimplifies a complex issue contributing to social and institutionalized inequalities. In this dissertation, this conception of unequal digital access will be termed the *initial digital divide*; "the simple binary description of a divide fails to do justice to the complex reality of various people's differing access and usage of digital technology" (Warschauer, 2003, p. 44). Moreover, the Office of Educational Technology (2017) notes the implications of this complex reality suggesting, "without thoughtful intervention and attention to the way technology is used for learning, the digital use divide could grow even as access to technology in schools increase[s]" (p. 20). Scholars and educators in technology-infused learning environments must both specify and expand upon the vague notion of the initial digital divide - including the ways in which the divide plays out in social systems and processes. The initial digital divide is an important first step in addressing digital access issues, yet it neglects to address digital usage issues.

Secondary Digital Divide. This dissertation research is more deeply situated in scholarship encompassing what is termed as the secondary digital divide. The *secondary*

digital divide, or *digital use divide*, may be understood as unequal usage of digital

devices and the Internet that hinders the ability to access, adapt and create knowledge. In

other words, the secondary digital divide operates around discrepancies in how

technologies are used in schools to enhance and transform learning opportunities

(Attewell, 2001; Warschauer, 2003; Warschauer & Matuchniak, 2010). Transformative

learning opportunities may be understood as students utilizing technology to create,

design, build, communicate, explore and collaborate; whereas low-level student

technology uses includes passive consumption of content and rote engagement with

digital worksheets, remediation games, word processing and online multiple-choice

assessments (Culatta, 2015, March 3; Office of Educational Technology, 2017; Valadez

& Duran, 2007). The secondary digital divide frames technology usage as an influencer

on social divides through educational, social, political, cultural, linguistic, economic and

institutional contexts (Araque et al., 2013; Gherardi, 2016; DiMaggio & Hargittai, 2001;

Leonardi, 2003; Norris & Conceicao, 2004; Selwyn, 2010; Warschauer, 2011a, 2011b;

Warschauer, Knobel & Stone, 2004). For example, Warschauer (2011a) asserts the

"digital divide refers to social stratification due to unequal ability to access, adapt, and

create knowledge via use of information and communication technologies" (p. 1). This

conception of the digital divide moves beyond simplistic binary notions through the

fusion of access with social constructs and knowledge creation.

The conception of the digital divide as a social divide is powerful in education.

The availability of reliable computers and Internet (the initial digital divide) influences

how technologies are used in classrooms (the secondary digital divide). Low-level

technology integration tends to correlate with teacher-centered pedagogies and practices; high-level uses of technology in classrooms are often practiced through student-centered, constructivist pedagogies and practices (Becker, 1994; Becker & Reil, 1999). Hokanson and Hooper (2004) suggest that limited, or low-level, technology integration practices which merely deliver context and increase efficiency deny students learning opportunities. Likewise, Barron, Kemker, Harmes and Kalaydjian (2003) in their research focused on the use of technology as a learning tool for research, communication, productivity, and problem-solving found many educators are still integrating technology for low-level learning tasks. High-level technology use in education may expand students' ability to construct meaning and participate socially in a global community. Accordingly, the concern is that "exclusion from these [internet-mediated economic, social, political, cultural] networks is one of the most damaging forms of exclusion in our economy and in our culture" (Castells, 2002, p. 3 as cited in Livingstone & Helsper, 2007, p. 673).

Social Opportunities with the Digital Divides. Social divisions around technology are pervasive within and outside of classrooms. The previous section noted spaces where technology in schools tended to diminish or aggravate social inequalities. As a result, my conception of digital divides within this study considers opportunities for social change through digital usage practices and beliefs that enhance learners' voice and agency for social participation in a digital age. My aim is to utilize the critical lenses of power, positioning and privilege in the equitable use of ICT by teachers and students to construct knowledge and participate in social systems through technology integration.

Technology Integration - A Participatory Practice

The secondary digital divide signifies social participation in a digital age as a means to gain access to the power in which social, political and economic practices and systems are lived out. Livingstone and Helsper (2007) also make the shift from access to equitable social participation through the frame of *digital inclusion*, a continuum which encompasses multidimensional use of technologies in relation to inequalities in society. In their exploration with youth between the ages nine and nineteen of why discrepancies in technology access and usage matters, they found that "more sophisticated [technology] use permits a broad-ranging and confident use of the [I]nternet that embraces new opportunities and meets individual and social goals" (p. 692).

Digital inclusion takes a variety of shapes and is both conceptualized and researched under different terms (Golding, 2002; Spears Postmes, Wolbert, Lea & Rogers, 2001). For example, Jenkins, Clinton, Purushotma, Robison & Weigel (2012) and Jenkins, Ito and Boyd (2016) explore *participatory culture* through youth's practices and voices which blur cultural production and social exchanges with technology. They describe participatory culture in online communities:

> in which members believe their contributions matter, and feel some degree of social connection with one another… suggest[ing] potential benefits of these forms of participatory culture, including opportunities for peer-to-peer learning, a changed attitude toward intellectual property, the diversification of cultural expression, the development of skills valued in the modern workplace, and a more empowered conception of citizenship. Access to this participatory culture functions as a new form of the hidden curriculum, shaping which youth will succeed and which will be left behind as they enter school and the workplace. (Jenkins et al., 2012, p. 3)

In this understanding of digital inclusion, social and cultural participation are positioned in relation to schooling and social stratification. Similarly, Miller, Becker and Becker (2016) use the term *participatory practices* in their scholarship on students' engagement with the affordances of technology to challenge oppressive forces. Soep (2014) uses the concept of *participatory politics* to investigate how youth learn, play, socialize and participate in civic life using technologies to exercise voice and agency on social issues. Furthering the digital inclusion for participation in civic life, scholars situated in critical pedagogy and social (re)constructivism perspectives, such as Kahn and Kellner (2007) and Schneider and Smith (2014), argue for the creation of participatory communities which utilize technology for progressive and democratic social gains.

Relevant to this dissertation, each conception of digital inclusion encompasses the use of technology as social capital to participate in aspects of life - socialization, political engagement, economic opportunities. While some scholars focus on social and cultural aspects of multifaceted technology use for social participation (Jenkins, et al., 2012; Jenkins et al., 2016; Livingstone & Helsper, 2007), other scholars frame social participation with aims to explicitly address social issues via how people learn and are socialized to exercise voice and agency in civic life (Kahn & Kellner, 2007; Miller, et al., 2016; Schneider & Smith, 2014; Soep, 2014). The melding of this scholarship is useful for understanding social opportunities with technology integration. This dissertation utilizes the term technology integration in ways that honor the multiple practices and complex ways educators and youth use technologies in the context of schools to participate more equitably in culture, knowledge, politics and society writ large.

My conception of the digital divides is grounded in elements of the initial digital divide, secondary digital divide and participatory digital practices. What is common across each of the areas of scholarship is the productive usage of technology for participation in social systems. Drawing upon these bodies of literature, technology integration practices may foster educators' and learners':

- construction of inclusive knowledge, social systems and practices;

- productive utilization of technology in ways that are relevant to the learners' context and social systems;

- disruption of educational inequalities, which is characteristic of marginalization for those with markers of difference (i.e. socioeconomic, race, gender, sexuality, culture, language, class, religion, etc.).

This conception of technology integration practices and beliefs means in elementary education that technology is used with and for learners to construct inclusive learning experiences. These learning experiences should foster local and global human connections. Furthermore, learners could participate in supported spaces to critically question social practices and take action. Learning experiences like these could facilitate tolerance, mutual understandings and appreciation for diversity while sparking action towards the creation of a more inclusive world.

Social Opportunities with Technology Integration

Technology access and usage in education creates opportunities to address social issues. Three social opportunities made possible with technology integration are outlined: #NeverAgain; strengthening communities; and critical social action.

The MSD High School's #NeverAgain movement shared in Chapter 1 highlighted

students' ability to create content, mobilize virtually and participate socially via the

affordances of technologies in sophisticated ways to position and amplify their voices.

Their social participation was enacted in terms of digital communication. Similar to

digital inclusion scholars, the #NeverAgain students employed their multidimensional use

of technologies to coordinate and foster digital inclusion across technological platforms

for social change. The social actions of these students, through the affordances of

technology, is a powerful example of what is possible in modern practices of social

participation, which is intentional scaffolding through technology integration in schools -

beginning with our youngest learners - is necessary.

Another social opportunity made possible through participatory practices in

technology integration is the strengthening of our communities. In a message delivered

at the United Nations Conference (2003), Amir Dossal advances the notion that

technology can be used to foster social goods:

> A 'digital divide' threatens to exacerbate already-wide gaps between rich and
> poor, within and among countries. The stakes are high indeed. Timely access to
> news and information can promote trade, education, employment, health and
> wealth. One of the hallmarks of the information society – openness – is a crucial
> ingredient of democracy and good governance. Information and knowledge are
> also at the heart of efforts to strengthen tolerance, mutual understanding and
> respect for diversity. (United Nations Secretary-General, 2003, para. 2)

Dossel's commentary notes the importance of social capital - including cultural

consciousness and compassion - made possible through participation in an information

society. Strengthening our communities with technologies as a participatory act may

start with or work alongside more equitable technology integration in elementary education.

Further, critical social action is a social opportunity made possible with technology integration. Extending Schneider and Smith's (2014) assertion that, "the relationship of technology to power will always need to be addressed" (p. 6), Miller et al. (2016) advocate:

> As technology continues expanding on a global scale, so too does the influence it has on the lived experiences of individuals. The power of technology to impact the ways in which we relate to each other and to systems of governance and oppression will only increase with time. As a result, this conversation [merging educational technology use and social justice] will become increasingly important in the coming years as society becomes increasingly immersed with types of technology that have the potential to contribute to emancipation but can also perpetuate the dominance of some individuals and groups over others. It is through meaningful dialogue… that we can bring light to the vast potential of the [technology] tools we have to forge a future that empowers even the least advantaged. (p. xvi)

I interpret Miller et al.'s (2016) positioning of critical social action through the merging of educational technology use and social justice practices as a call to action. This viewing draws upon the notion of digital divides as social divides while utilizing the relationship of technology with critical social participation to forge a more equitable future.

Implications for Practice and Research

Beyond technological access, broad economic, political and social issues are operating when technology is integrated into elementary classrooms. Varied technology usage contributes to social inequalities (Attewell, 2001; Barzilai-Nahon, 2006, DiMaggio, Hargittai, Celeste & Shafer, 2004; Hargittai, 2004; Korupp & Szydlik, 2005;

Livingstone & Helsper, 2007; Norris, 2001; Ono & Zavodny, 2007; Selwyn, 2004; van Dijk, 2005; Warschauer, 2003; Zillien & Hargittai, 2009). Notably, when technology is utilized to facilitate human connections, the digital usage inhibits or enhances the production of knowledge (Warschauer, 2011a).

This dissertation strives to move beyond a binary notion of digital divides towards technology integration as a means of social inclusion. In the context of elementary education the majority of technology is utilized for rote content consumption (Becker & Ravitz, 1999; Barron et al., 2003, Culatta, 2015; DOE, 2003; Hokanson & Hooper, 2004; Office of Educational Technology, 2017; Valadez & Duran, 2007). I position K-12 technology integration practices as agentic in reinforcing or disrupting social inequities (Araque et al., 2013). The sole power for social change resides not in the technologies themselves; rather I privilege the relationships among people, social systems and the use of technologies and believe that these relationships have the potential to interrogate and disrupt social inequities.

Summary: Forging a New Path Towards More Equitable Technology Integration

> *"We cannot remain examining oppressions.*
> *We must find the radical imaginations."*

- Dr. Muhammad Khalifa, Debating Teacher Education: Critical Foundations and the Future of Teacher Education (speech, March 29, 2018)

The inquiry of pursuing more equitable technology integration in elementary education is offered as an imagination for the fields of elementary education and learning technologies. When positioning the use of technology as simultaneously a social issue

and social opportunity, it is useful to note how this dissertation is situated and synthesizes the calls within the literature.

Critical examinations of teaching and learning which prepare people to take action to enfranchise all members of society were inspired by the work of Freire (2000). In the learning technologies field, Porfilio (2016) invites us to engage critical awareness of technology uses' impact on social relations. Focusing on critical awareness, Gherardi (2016) calls for scholarship in which technology use and technology-based initiatives focus on social context. With these ideas in mind, understandings of social contexts, specifically how technologies and their uses deconstruct or reify social structures in classrooms and communities (Armfield, 2016), are important for the interrogation of assumptions and practices in thinking, practices and relationships to reconstruct them into more equitable social opportunities. Scholars such as Miller et al. (2016) and Gherardi (2016) acknowledge the imperfect and dynamic world we live in - including our school systems - and call for humanizing uses of technology.

Researching the pursuit of more equitable technology integration in elementary education responds to these scholarly calls in three ways. First, technology integration as it is conceptualized in this dissertation leverages relationships. Educators and learners are in relationships with technologies, and to date, this is an under-researched aspect of technology integration. Explicit in this conceptualization is the privileging of relationships among people, technologies and social systems. Second, professional learning, an asset building approach in which educators are situated with agency to (re)shape technology integration practices, is employed in this dissertation. The review

of literature identified educators' beliefs as a prominent barrier in technology integration. During the professional learning aspect of this dissertation participants had opportunities to interrogate of assumptions and beliefs around their thinking, practices and relationships to reconstruct technology integration into more equitable social opportunities. Third, in response to calls for humanizing uses of technology in our dynamic world, the social aspects of teaching and learning with technology are incorporated extending the literature in elementary education. This research expands upon scholarship in technology integration as an imagination for the fields of elementary education and learning technologies. Through repositioning technology integration in elementary education as a social opportunity we may begin to imagine and enact a more equitable future.

In the next chapter, relationships amongst people, technologies and social systems are explored through Zhao and Frank's (2003) ecological perspective of technology integration as a conceptual commitment. Within this technology integration ecosystem epistemological pluralism, phenomenology writ large, post-intentional phenomenology, and critical theory are discussed as they operate and interact as a dynamic process in this dissertation. These conceptual commitments inform the study design of technology integration as a social issue in education.

Chapter 4: Unpacking Conceptual Commitments

"When you step into an intersection of fields, disciplines, or cultures,
you can combine existing concepts into a large number of extraordinary ideas."

- Frans Johansson

Educators, politicians, scholars, theorists, philosophers, poets, historians, communities, families and children have all chimed in on a fundamental, yet inextricably complex question, "What is education?" Whether one believes that the purpose of education is teaching one to think, to prepare for life, to develop abilities, to generate character, or as a path to freedom, what is most interesting about education is that it occurs at the intersections of knowledge, society, and power. This research positions *intersectionality* as a lowercase i, rather than in the broader uppercase I, *Intersectionality* scholarship. Intersectionality (as an uppercase I) is a thread of social justice scholarship that explores the intersections of markers of difference (e.g. race, gender, class, sexuality, identity) as a theoretical framework and analytic tool (Carbado, Crenshaw, Mays & Tomlinson, 2013; Cho, Crenshaw & McCall, 2013; Crenshaw, 1991; McCall, 2005). In this study, intersectionality (as a lowercase i) is employed as a place where multiple concepts intersect and are in relationships with one another in order to understand the intertwined nature of people, social systems and the use of digital tools within schools.

This chapter deconstructs conceptual commitments to situate ways in which the pursuit of more equitable technology integration is studied. First, Zhao and Frank's (2003) ecological perspective of technology integration is discussed. Then, the conceptual commitments of this dissertation - epistemological pluralism, phenomenology writ large, post-intentional phenomenology and critical theory respectively are discussed.

These conceptual commitments are then utilized throughout the remaining chapters of this dissertation.

Technology Integration as an Ecosystem

According to Merriam-Webster Dictionary (2018), an ecosystem is defined as "the complex of a community of organisms and its environment functioning as an ecological unit" (https://www.merriam-webster.com/dictionary/ecosystem, 2018). An organism is an individual entity which grows in and responds to the environment. Species, a term used to classify organisms, encompasses multiple organisms with similar attributes. Two or more different species may occupy the same environment at the same time. An environment involves species and the physical surroundings; in the field of ecology, ecologists study the relationships and interactions of organisms with each other and the environment. An ecosystem is an interdependent operative structure with species interacting and enacting various roles within the system. Keystone species are well established in their roles, maintaining foundational relationships which influence functionality and survival of the system. Invader species enter an existing ecosystem, disrupting its roles and relationships.

To illustrate an existing interactive ecosystem, I use a representation of the Minnesota lakes[19] (see Figure 4.1). The ecosystem itself is permeable in that species may enter and exit the ecosystem. Species adapt to new roles within the system through

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[19] The University of Minnesota's Agricultural Experiment Station (https://www.maes.umn.edu/, 2018), The Aquatic Invasive Species Research Center at University of Minnesota (https://www.maisrc.umn.edu/ais-mn, 2018) and the Minnesota Department of Natural Resources (https://www.dnr.state.mn.us/, 2018) were resources for the creation of this ecosystem representation.

interactions and relationships with other species and the environment. In this example, crayfish and water fleas interact and have a relationship with Great Blue Herons and tadpoles. Wild rice, bulrushes and water lily interact and are in relationships with loons, bullheads, Eurasian Watermilfoil, Zebra mussels and turtles. Each species interacts with each other within the system and the environment thereby enacting roles in the ecosystem.

Figure 4-1. Ecosystem structure – An example representing Minnesota lakes.
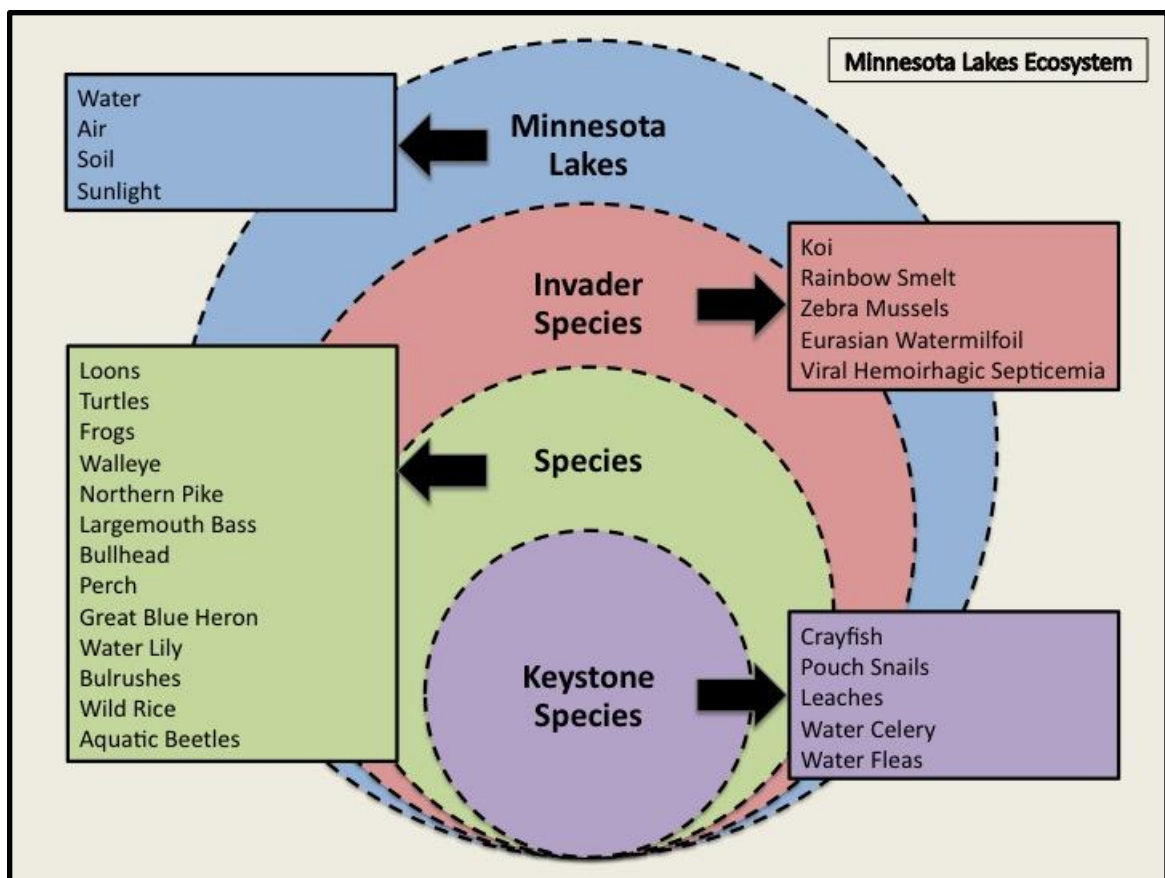
Even with a constant flow of species entering and exiting, ecosystems tend to achieve homeostasis (internal equilibrium). An ecosystem's internal equilibrium is established within a hierarchical structure through the ways each species interacts.

Diverse species with particular characteristics and roles, exist and survive while simultaneously modifying species' relationships and the environment in dynamic processes. For instance, Koi (common carp) is considered an invader species in Minnesota lakes. The ways in which Koi interacts and is in a relationship with other species of the ecosystem (e.g. water lily, walleye and largemouth bass) modifies each species' roles and relationships with the environment which disrupts the homeostasis of the ecosystem.

Zhao and Frank (2003) contend that schools are ecosystems where technology usage and educators are species and where technological innovations and educational initiatives are invading species. In this technology integration ecosystem metaphor, "the introduction, survival, and dispersal of an alien [invader] species in a new environment are complex processes" (Zhao & Frank, 2003, p. 808). Invader species are new species that are introduced into the ecosystem (intentional or unintentional) which interact with existing species affecting the internal equilibrium of the ecosystem:

> "Depending upon the properties of the invader and of the existing species, as well as on the types of interactions, several consequences may result: (a) The invader wins and wipes out the existing species; (b) both win and survive, in which case some other species may perish or the ecosystem may eventually become dysfunctional because of its limited capacity; (c) the invader loses and perishes; and (d) both the invader and the existing species go through a process of variation and selection and acquire new properties" (Zhao & Frank, 2003, p. 813).

Zhao and Frank's (2003) point is that contemporary technologies are invader species in school systems and the integration of them are complexly dynamic. Zhao and Frank have established ecosystem theory as a unifying "analytic framework for understanding technology uses in schools" (p. 807). They argue that factors influencing technology

integration should not investigated and understood in isolation, but rather emphasis
should be placed on the nature of co-evolving relationships among teachers, students,
technology and school/social systems. By way of illustration, Figure 4-2 is a
representation of how schools may operate as a technology integration ecosystem.

Figure 4-2. Technology integration ecosystem.
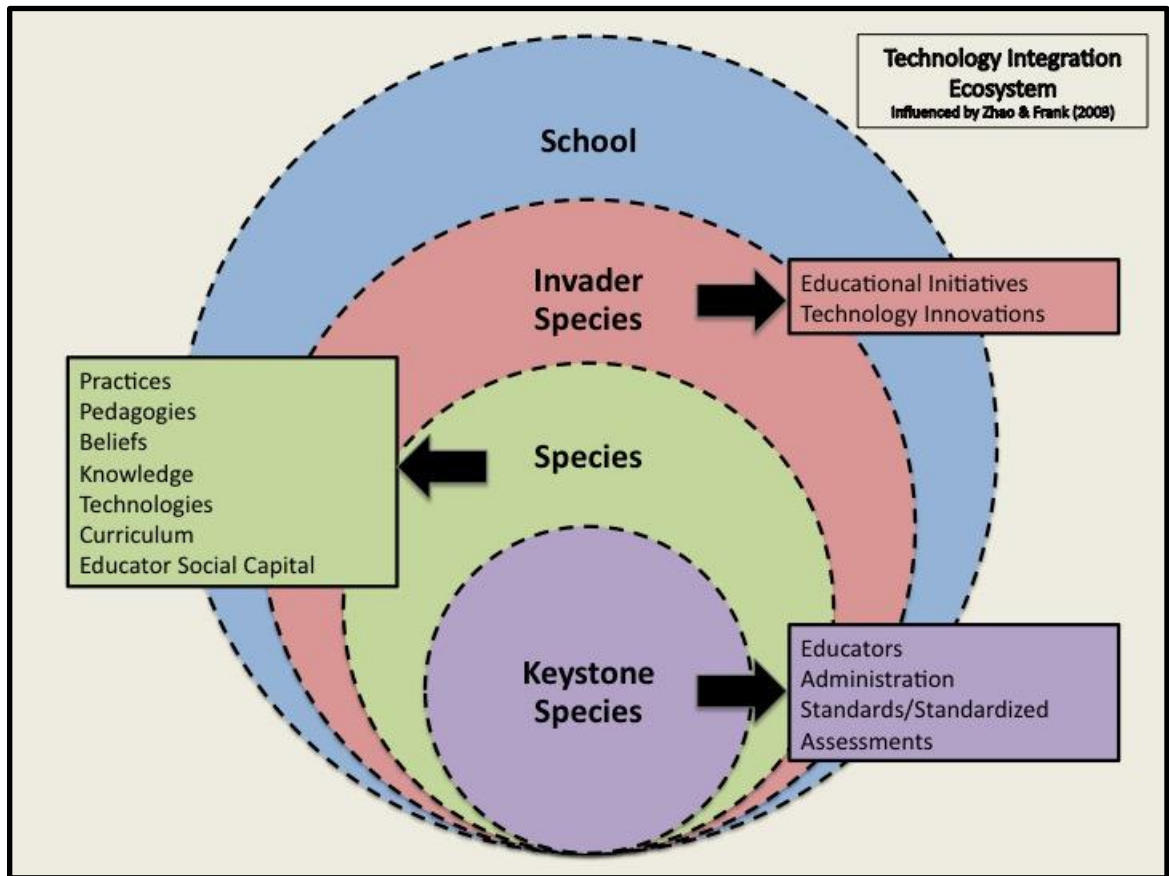
Like the Minnesota lakes ecosystem, the technology integration ecosystem is
permeable in that species may enter and exit the ecosystem. Species such as curriculum
and pedagogies adapt to new roles within the system through interactions and
relationships with other species and the environment. In other words, educators and
curriculum interact and have a relationship with classroom pedagogies and practices.

Learners, iPads/ChromeBooks, and school district initiatives interact and are in relationships with uses of technology tools, technology innovations and school/social systems. Zhao and Frank (2003) argue emphasis should be placed on the nature of coevolving relationships in the technology integration ecosystem rather than on isolated factors.

Conceptualizing technology integration as an ecosystem is important because technology use in schools has failed to have a lasting impact on K-12 teaching and learning (Cuban, 2001; Zhao, Pugh, Sheldon & Byers, 2002) despite the fact that technology is inextricably woven into many aspects of our daily lives. This reality perpetuates a disconnect between schools and society. As discussed in Chapters 2 and 3, an extensive list of factors impacting K-12 technology integration are all aspects of larger social and schooling systems. Zhao and Frank (2003) advocate for an ecological framework to explore the relationships among the factors and processes of integrating technology into educational contexts. They conducted a study between 1996 and 2001 across four school districts and nineteen elementary schools that explored the social dynamics of technology integration (Zhao & Frank, 2003). This study found that technology uses in the schools could be considered as complementary or competitive to the ways species (educators, technologies) interact in the educational ecosystems. In addition, educators' social capital, mutualistic interactions with technology, and mutual adaptations of self and technology uses play a significant role in the destiny of invader species (technologies) in school systems (Zhao & Frank, 2003). The destiny of species, in this case the invader species of technologies and their uses in elementary education,

may be shaped by the co-presence of knowledge, beliefs, opinions, and intuitive/subjective understandings of technology uses as legitimized organisms in classroom environments.

Epistemological Pluralism

A singular approach to knowledge may lead to the belief that one knowledge - a universal understanding - is accepted and accurate. This myopic view can reveal white supremacy and how it is woven into the habits and traditions of schooling. To avoid the creation or reification of a single dominant truth, educators should examine their own concepts of knowledge, teaching and learning. This section strives to make the intersectional relations regarding the nature of knowing visible as a path towards educational practices that cultivate cognitive and social justice.

Studying what makes up knowledge, the types of things we can know, the limits to what we can know, and even if it is possible to actually know anything at all is a discipline called *epistemology*. "The word epistemology comes from the Greek words *episteme* which means knowledge and *logos* which means a word or reason. Epistemology literally means to reason about knowledge" (Pardi, 2011). Hofer (2001) argues that a critical component of knowledge-acquisition and knowledge-construction processes are beliefs about knowledge and knowing. Reasoning about knowledge and how these commitments affect or mediate learning processes are crucial not only to understanding students' learning, but also to informing educators' teaching practices. Epistemologies take shape in the ways people interpret and evaluate information, influence strategy use and cognitive processing, and facilitate the resolving of competing

knowledge claims. The ways in which people understand epistemologies results in fundamental decision-making about knowledge and interpretations regarding how the world works. While there are substantial implications, epistemological commitments often remain unnamed, assumed and unquestioned. When scholars name how they situate their research epistemologically, underlying assumptions can be interrogated rather than positioned as a taken-for-granted truth.

Therefore, it is essential for scholars and educators to name epistemological commitments. This explicit naming helps to underpin what informs pedagogies and practices with specific underpinnings regarding how knowledge is acquired and legitimized. Within the United States, educational practice positions Western, colonial and Eurocentric culture and knowledge as the norm by which local knowledge and cultures are compared. Binaries emerge through *epistemological dominance* (Battiste, 2004; Coleman, Battiste, Henderson, Findlay, & Findlay, 2012) rendering hegemonic white/cultural supremacy knowing as superior and indigenous/other cultures as deficient and lacking. Healy (2003) argues epistemology is a matter of practice in which precedence is placed on context and learning processes. The concentration on practice highlights the means by which educators perceive how knowledge is constructed, dispersed and pragmatically applied. For example, the International Baccalaureate Organization (IBO)[20] identifies eight ways of knowing: language, sense perception, emotion, reason, imagination, faith, intuition and memory. The IBO (2018) advocates

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[20] The IBO is the International Baccalaureate Organization (http://www.ibo.org/about-the-ib/) which provides four programmes for schools (ages 3-19) focused on inquiry, critical thinking and international perspectives.

that epistemological commitments should be viewed and practiced as interconnected and not operating in isolation. Another conception of multiple ways of knowing may be drawn from Anishinaabe (the Ojibwe) people who identify seven ways of knowing as: relating, behavior, responsibility, thinking, language, knowing and doing (Gross, 2016).

Subsequently *epistemological pluralism* is "motivated by the realization that any single way of knowing is insufficient for understanding the complexity of the world" (Miller, Baird, Littlefield, Chapin III, & Redman, 2008, p. 3). This understanding of knowing recognizes that knowledge and reality are seen as socially constructed and in flux. Pluralism assumes knowledge is produced through multiple worldviews as situated and living with complexity, diversity and uncertainty. Pluralistic approaches can assist scholars, educators and students in engaging with complex understandings of how the world works that "might lead to the production of more fully integrated knowledge" (Miller et al., 2008, p. 2) in research and in practice. Epistemic pluralism fosters diverse knowledge-acquisition and knowledge-construction processes which can lead to cognitive justice, which in turn can lead to social justice. de Sousa Santos (2007) advocates for an *ecology of knowledges*, which is a plurality of knowledges that are sustained and dynamically interconnected while respecting unique autonomy as a path towards pluralistic ways of knowing. Reasoning about knowledge, and how epistemic commitments affect or mediate learning, is crucial to inform teaching practices through an equity lens.

Epistemological pluralism refers to and legitimizes multiple ways of knowing things (Healy, 2003) through an emphasis on fluidity and provisionality of knowledge

and learning (Andreotti, 2009). The essence of Andreotti (2009) and Heely's (2003) positions may be likened to an ecological perspective of knowing. Thus, an ecological perspective of technology integration which incorporates epistemological pluralism as a species situates the combined presence of knowledge, beliefs, opinions, and intuitive/subjective understandings of technology uses as legitimized organisms in classroom environments. Further, epistemological pluralism in a technology integration ecosystem can be understood as a path to explore connectedness and disrupt binary practices in teaching and learning. This dissertation positions epistemological pluralism as an ecological and conceptual underpinning to inquire into the multiplicities and phenomenological productions and provocations.

Phenomenology Writ Large

Prior to exploring the post-intentional phenomenological research approach employed in this study, the origin and evolution of phenomenology as a philosophy is discussed. The generative aspects of the philosophical, theoretical and methodological assumptions of phenomenology provides context for the development and application of post-intentional phenomenology as it is used in this research.

Phenomenology as philosophy. Phenomenology was first developed as a philosophy. Moran (2001) describes phenomenology as "a [philosophical] practice rather than a system" (p. 4). This philosophical practice rejects positivistic experimental systems, and ultimately phenomenology rejects Descartes' western thought in which meaning is isolated to the mind and unable to move in and through the world. Likewise, Merleau-Ponty's (1974) phenomenology of perception pursued 'being-in-the-world' -

engaging in the world through *embodiment* in which there is no distinct separation

between the body and the mind in sense-making. This philosophical concept shifts from

seeking pure essence towards being attuned to what is often overlooked in bodily context.

Bodies are the access point to the world in this conception of embodiment (Ihde,

2003). Embodiment is the context for which we feel, see, think, do and perceive the

world - it is essential for being-in-the-world. Embodiment situates one towards

awareness, attention and intention as working layers to the phenomenon. While scholars

situated in positivist ways of knowing would probably object to embodiment, those who

practice epistemological pluralism would likely align with being-in-the-world as a mode

of knowledge construction. In this dissertation, embodiment as a philosophically

informed phenomenological concept is not only recognized but embraced as a mode to be

attuned to in the pursuit of more equitable technology integration.

     Ihde's phenomenological philosophy of technology. Ihde puts technology in

the center as he situates the role technologies play in our culture and in people's everyday

lives. Specifically, Ihde's (1979) post-phenomenological philosophical approach to

technology hones in on relations among human beings, technologies, and the world. Idhe

describes relations as ranging from being 'embodied' and being 'read', to being

'interacted with' and being at the 'background'. This dissertation uses three of Ihde's

(1979) phenomenological philosophical insights as conceptual commitments: heuristic

and embodied relations with technology, technocracy and power structures.

     Heuristic and embodied relations with technology. A heuristic relation occurs

when a novice technology user has experiences "of" a technology (e.g. computer, tablet,

Internet, program/tool) as they are initially learning how to use it (Ihde, 1979). An

embodied relation occurs when a technology user has an experience "through" the

technology. In this human and technology relationship, the technology tool itself is

secondary (Ihde, 1979) while the relationship as it is 'interacted with' becomes an

embodied experience.

Technocracy. Ihde (1979) claims that technology is not a mere tool; instead,

technology is positioned as a socially-constructed cultural instrument. To this end,

technocracy - a technological way of being-in-the-world that influences the experiencing

of the life world (i.e. lived time, space, body, relations) (Ihde, 1979) - mediate and

influence human ways of being-in-the-world. Literally and figuratively technology

influences how humans relate to one another, how humans communicate, present

themselves and their bodies and how humans perceive and experience their

environments.

Power structures. The competing cultures of consumption and creation are

prevalent in Ihde's (1979) conception of technological power structures. In his

phenomenological philosophy of technology, Ihde represents the ways in which those

who participate in a culture of creation maintain power and influence in a technocracy

through the control of computer languages, programming and web development. Values

practiced in the digital age and its ways of thinking position technocracy creators with the

ability to disrupt traditional power dynamics. Therefore, in a technocratic worldview,

technology creators, rather than consumers, hold potential to disrupt power structures and

influence how being-in-this-world is experienced, constructed, deconstructed and reconstructed.

Ihde's (1979) phenomenological philosophical insights are situated as conceptual commitments in this dissertation. These commitments are positioned as organisms in the technology integration ecosystem (Zhao & Frank, 2003). Hence the exploration of the pursuit of more equitable technology integration positions power structures, technocracy and heuristic embodied relations with technology in the viewing of organism interactions within the ecosystem. Therefore, emphasis is placed on the symbiotic nature of coevolving organism interactions.

Phenomenology as methodology. Phenomenology as a methodology seeks to return knowledge to manifesting as it is lived - being and becoming - exploring human experiences as they appear and are connected to the world (Dahlberg, Dahlberg & Nystrom, 2008; Vagle, 2014; van Manen, 2014) at various points in time. Phenomenology does not seek to control or explain the world, but rather "aims at gaining a deeper understanding of the nature of meaning of everyday experiences" (van Manen, 2001, p. 9) to connect with the world.

At the foundation of phenomenology as a methodology, the unit of analysis is the phenomenon itself (Dahlberg et al., 2008; Moustakas, 1994; Vagle, 2018; van Manen, 1997). The researcher does not seek characteristics, causes or cures of a phenomenon. Instead, the researcher seeks to explore the deep meaning of the phenomenon from humans' experiences of the phenomenon (Dahlberg et al., 2008). The phenomenological discipline in which a researcher situates their work within informs how the phenomenon

is studied. For example, Husserl's (1970) descriptive/transcendental phenomenological philosophy took into account the human experience of things with a focus on finding the *essence* of a phenomenon. To this end the phenomenon is reduced from its context and perceived understandings, more commonly known as *bracketed*, as a means to purify and simplify it. These philosophical commitments significantly informed the development of the descriptive phenomenological approach in the human sciences.

Heidegger's (1998) interpretive/hermeneutic phenomenological philosophy is another example. Heidegger sought to explore what is it like to be in the world. The phenomenological methodological approach stemmed from Heidegger's focus on how context is brought to bear on the phenomenon. Neither the individual phenomenon nor the context can be understood without reference to one another. How the phenomenon manifests and matters in the context demands the researcher's focus (Cerbone, 2008). Therefore, stressing the '*in-ness*', that meaning must be both located and situated within the phenomenological context, is crucial.

Post-intentional phenomenology, like hermeneutic phenomenology, moves away from using essence in descriptive methodology. Post-intentional phenomenology instead investigates *tentative manifestations* of phenomenon as partial, malleable, permeable, multiple and shifting (Vagle, 2010, 2014; Vagle, Clements & Coffee, 2017; Vagle & Hofsess, 2016). In 2018, Vagle further developed post-intentional phenomenology. While this refined methodological approach will be discussed in depth within Chapter 5, it is important to note the shift from tentative manifestations in early iterations of post-intentional phenomenology to *productions* and *provocations* in the most recent iteration.

To this end, a production signals the ongoing shaping of a phenomenon over time and a provocation is understood as an intense catalyst strongly shaping the phenomenon (Vagle, 2018).

Post-intentional phenomenology does not seek to center meaning; instead, it seeks to engage with flexible, malleable and permeable multiple meanings. Therefore, the use of the preposition *through* in post-intentional phenomenology is considered to signify relational movements - dynamic, entangled and always in motion. For this reason, emphasis and careful attention is paid to contexts in which subjects and objects interact. It is in those contexts, and the influences on them, that the relationship with the phenomenon is taking shape, being shaped, and can be studied.

Phenomenological commitments. Phenomenology, regardless of which methodological approach is being used, commits to "...confront unexamined assumptions of our personal, cultural, political, and social beliefs, views, and theories" (van Manen, 2014, p. 13). Phenomenology is employed in this dissertation to understand complex social worlds (Creswell, 2008) in which the understanding of experience is required to problematize what is assumed and unexamined related to the phenomenon. Post-intentional phenomenology explores phenomena as they appear and are connected to the world through producing and provoking as they are being and becoming. These post-intentional phenomenological commitments position intrigue, perplexion, connections, disconnections, shock, and 'ah-ha' moments (Vagle, 2018) as fruitful given an ecological technology integration perspective.

With this perspective, multiple species occupy and interact with elementary school ecosystems. The ways in which the species interact with and affect each other and the environment while simultaneously modifying relationships with each other and the environment are dynamic processes. These processes can be understood through post-intentional phenomenological commitments. It is for these reasons that the phenomenon of the pursuit of more equitable technology integration led to post-intentional phenomenology being chosen as the methodology for this dissertation.

Post-Intentional Phenomenology: Assumptions and Delimitations

This research assumed that phenomena of pursuing more equitable technology integration is social in nature, not individual (Vagle, 2018), which required a dialogic quality in the exploration of complex, changing and competing contexts. Understanding the personal, social, ethical and political relations and how they connect (or disconnect) people with the world, provided opportunities to understand why and where shifts/changes may be needed in experiences, social realities, and/or teaching and learning with technology. Being cognizant that examining relations through multiple lenses is both productive and generative, post-intentional phenomenological analysis can discern how productions and provocations of the phenomenon produce social change (Vagle, 2018).

Theorizing through a 'post' lens. In poststructural thought, the nature of realities and ways of knowing are multiple, dynamic, partial, situated, and fleeting (Hlynka, 2004; Solomon, 2000; Yeaman, Hlynka, Anderson, Damarin & Muffoletto, 1996). To illustrate, St. Pierre (2013) claims, "Ontology in the 'posts' flattens what was

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assumed hierarchical. Here, there is no real - nothing foundational or transcendental - nothing beneath or above, outside - being to secure it" (p. 649). She expands upon theorizing ways of knowing with a poststructural lens in her understanding of Deleuze and Guattari's (1987) ontology as "entangled, connected, indefinite, impersonal, shifting into different multiplicities and assemblages" (St. Pierre, 2013, p. 653). In this dissertation, technology integration is situated in an ecosystem with dynamic and fleeting technology innovations, beliefs and practices. Theorizing this ecological perspective of technology integration through a 'post' lens is useful in the exploration of the phenomenon pursuing more equitable technology integration.

  Generative, partial, multiple constructions of the phenomenon in flux. Vagle (2014) conceptualizes phenomena as circulating and evolving in constant states of construction. Slattery (2012) suggests phenomenological knowledge is understood as a human construction where life is a socially "enacted, meaning-embedded experience, inseparable from human beliefs, values, and creativity" (p. 242). This inseparable fluid construction conception evades a concrete entry or exit point with the phenomenon. Deleuze and Guattari (1987) note subjects are not stable and researchers enter in the middle as the phenomenon is both being and becoming. They suggest researchers should name their positionality *in* and their relationship *with* data. Post-intentional phenomenology does not seek to locate concise and stable outcomes but rather learn about human experiences as they illuminate productions and provocations of the lived world. These productions and provocations are to be philosophized, conceptualized, interrogated and contemplated (Vagle & Hofsess, 2016).

Ontologically, post-intentional phenomenology lives in the margins of phenomenology and post-structural ideas (Vagle, 2015). Post-structuralists tend to believe understanding and meaning-making are context specific due to the fact that they are human constructions. Further, post-structural conceptions in understandings are perceived through the assumption that meaning is not a 'singular' or 'essential' construct, but rather meaning is understood as multiple, complex, changing and never complete as it is constructed and interpreted through experiences (e.g. emotions, actions, discourses, embodiments, connections with phenomena). Specifically, post-intentional phenomenology draws upon poststructural conceptions that knowledge is partial and evolving (Vagle & Hofsess, 2016). The best a researcher can do is write about the productions and provocations in the moment of the research as the phenomenon's assemblage is constantly being made and unmade.

Using rhizomes and embodiment to explore assemblages as way of knowing. In post-intentional phenomenology, terms such as rhizome, embodiment and assemblage, are applied in particular ways in the making and unmaking of the phenomenon's assemblage. Deleuze and Guttari's (1987) *rhizome* is a gnarly, generative and intertwined assemblage, and the ways in which it persists and recreates itself shapes how phenomena are conceived as rhizomes live through entangled and actively-evolving relationships. *Embodiment* as it is lived out in post-intentional phenomenology forms an *assemblage* - it is not singular or stable - where experiences are performed through mind and body (Vagle et al., 2016). Post-intentional phenomenologists disrupt academic research's positivist impositions and study embodied responses as a means toward

exploring ways of knowing assemblages as it becomes through the process of reflexivity (Vagle & Hofsess, 2016).

Intentionalities running through the lifeworld. While rhizomes and embodiments are utilized to investigate assemblages as a way of knowing, intentionalities are relations that move through them in the lifeworld. Although phenomenological aims morph over time with new philosophical and methodological conceptions, what remains central is investigating *intentionality*. Post-intentional phenomenology describes intentionalities as multiple, nonlinear, evolving and fluid in motion. The 'posting' of intentionality makes the shift towards phenomenon being embodied through social relations. Whereas Husserl's (1970) *intentionality* refers to the connection (relationship) between humans and the world (or of a particular phenomenon), Vagle's (2014) *intentionality* uses Deleuze and Guattari's concept of lines of flight (phenomena are pluralistic, eluding, entangled) as being and becoming and linked to social contexts. Intentionality in post-intentional phenomenology does not reside within humans or objects, but rather intentionalities are the relations that run through the lifeworld. Intentionalities can be investigated through human experience and interpreted through the social contexts of existence (Vagle, 2014).

'Plugging in' to produce and provoke phenomenon. In social contexts, intentionalities are explored with 'little m methods'. In phenomenological methodologies, 'little m methods' are practiced in divergent ways reflective of the research commitments. With descriptive phenomenology, Husserlian bracketing renders prior knowledge, theoretical explanations and understanding as non-influential and sets

them aside in order to explore the essence of how a phenomenon is being lived rather than how it is being conceptualized. The researcher suspends, not questions, what is informing significance in brackets. In Hermeneutic phenomenology, Dahlberg's (2006) bridling approach aims to uncover ontological questions of what it is to be in the world as subject and object; both the subject and object have agency being in relation with one another. Bridling is the tightening or slackening of the researcher's intentional relation and context with the phenomenon in order to interrogate how it influences, not whether it influences, the phenomenon. In this tradition, the researcher utilizes bridling knowledge to have a dialogue with and interpret the phenomenon.

In contrast, post-intentional phenomenology intentionalities are investigated with a 'plugging in' approach that works across and through connections, contradictions and interactions (Vagle, 2014, 2018). The 'plugging in' occurs as the researcher puts experiences, conceptions, theories, phenomenological materials in dialogue with one another (Vagle & Hofsess, 2016; Vagle, 2018). The researcher's experience of the phenomenon is also 'plugged in' and not sequestered away. The 'plugging in' as a *little m* method facilitates a deep examination of the phenomenon as it is produced and provoked with intentional relations.

Productions and provocations: Working in the margins for social change. Vagle's (2018) conception of productions and provocations employs a post-structural lens to investigate an ever-changing nature of intentional relationships with a phenomenon specifically around a social issue. This methodological approach emphasizes entering into a dialogue with meanings as they relate to contexts, situations

and partial understandings of the phenomenon (Vagle, 2014) to particularize plausible insights as we connect with the world (van Manen, 2014). To do this, post-reflexivity (discussed in Chapter 5) is situated in Lather's (1993) work to 'see what frames our seeing'. This relational process is used to explore the evolving knowledges that are at work (Vagle & Hofsess, 2016); perpetuating the cycle of producing and provoking the phenomenon.

Productions and provocations in post-intentional phenomenology capture fluid, flexible, malleable and permeable connections in motion. Nuanced noticings in post-intentional phenomenology do not seek to generalize findings by "taxonomizing, classifying, codifying, or abstracting" (van Manen, 2014, p. 66). Rather, crafting phenomenological research "embraces open searching, tinkering, and reshaping" (Vagle, 2014, p. 104) with action (as a liberating influence or as a dialogic production being constructed, deconstructed and reconstructed) in order to work in the margins for social change.

Post-intentional phenomenology in a technology integration ecological perspective. Working in the margins for social change assumes one is knowledgeable about the margins and the social constructs of each intersecting system. Being informed in each of the intersecting ecologies is essential for the introduction of invader species. Post-intentional phenomenology and a technology integration ecological perspective (Zhao & Frank, 2003) are complimentary as they both seek to understand interactions within evolving systems. Zhao and Frank (2003) state, "...we can no longer continue the tradition of studying discrete factors in isolation. Instead we need to become 'ecologists'

and provide an organic, dynamic, and complex response to this organic, dynamic and complex [technology use in schools] phenomenon" (p. 810). In the same vein, post-intentional phenomenology assumes phenomenon are dynamically complex and "privileges how things connect rather than what they are… in all sorts of unstable, changing, partial, [and] fleeting ways" (Vagle, 2014, p. 118). Both post-intentional phenomenology (Vagle, 2014, 2018) and a technology integration ecological perspective (Zhao & Frank, 2003) regard context as essential.

In this dissertation, the social structures of schools and societal factors of communities are not only relevant as the environment, but are also vital in the understanding how the context (school ecosystem) is producing and provoking the phenomenon. Critical lenses of power, positioning and privilege are valuable in exploring the hierarchical nature of the school ecosystem where diverse species affect one another while simultaneously modifying relationships with each other and the environment.

Critically-Oriented Thinking

Given that the phenomenon under investigation centers equity work in education, critically-oriented thinking is fundamental within the conceptual commitments of this dissertation. The concepts of power, positioning and privilege are used in this research, specifically equity in education, theoretical commitments, practical applications and representation within the technology integration ecosystem.

Equity in education. In its most straightforward conceptualization, equity in education means that personal or social circumstances (e.g. race, gender identity, social

class, sexual orientation, ethnic origin, religious beliefs, ability-level, family background) are not obstacles to learners in achieving their highest educational potential. Debates on terminology and practices between *equity* and *social justice* are ongoing. An equity approach signals targeted action for the most marginalized or disadvantaged communities first. Comparatively, a social justice approach signals addressing particular communities' needs in order to reach the greatest number of people (Equity for Children, 2013). In educational research, equity and social justice terms can be applied interchangeably as both ideas promote opportunity and aspire to reduce inequalities. For the purposes of this dissertation, equity and social justice are understood as addressing educational barriers occurring due to social circumstances, hegemonic systems and less pliable social constructions.

A distinction between the terms *equality* and *equity* is necessary. Equality assumes sameness, uniformity, interchangeability. Equity assumes the diverse, unique individuality of each person. Ultimately, equity pursues fairness for diverse people whereas equality strives for numerically equal outcomes for different people. This dissertation commits to the term *equity* as it honors unique multiplicities of individuals and communities while advocating for opportunity and striving to reduce inequalities.

Theoretical commitments: Critical examinations of education with power, positioning and privilege frames. Critical theory is a philosophical approach to culture. Critical theorists view the world as satisfying the needs and power of humans (Horkheimer, 1972) as they are connected to social movements through the combination of philosophy and social sciences. In the philosophical sense, critical theory draws upon

hermeneutics to interpret and explain texts and symbolic expressions (Hart, 1990;

Giroux, 2003; Horkheimer, 1972; Stanford Encyclopedia of Philosophy, 2005, 2016), and

draws upon Marxism to examine knowledge systems oriented toward interpreting,

critiquing and changing society (Greisman & Ritzer, 1981; Kincheloe & McLaren, 2002;

Reeves, Albert, Kuper, & Hodges, 2008).

Critical social theorists seek to understand lived experiences in context through

interpreting practices and structures of society in order to uncover and interrogate the

ways in which social groups are oppressed (Seiler, 2008; Watkins, 2001). Critical social

theorists move beyond seeking to understand or explain society to acting as a liberating

influence. Drawing upon structuralism, critical social theorists position 'knowledge as

power', specifically the creation and communication of knowledge, as a liberating change

agent in social systems (Leonardo, 2004; Symcox, 2002).

Knowledge creation and social participation through the use of digital tools, as

exemplified in the Chapter 1, are integral aspects of modern social systems. If, as

Watkins (2001) claims, "education can be used both to oppress and to liberate" (p. 1),

then the critical use of technologies in education is necessary for equitable practices.

Given that power plays a role in what schools teach, teaching practices often privilege

and marginalize particular groups of people (Nielsen-Winkelman & West, 2016). A

critical understanding of what and how learners are taught illustrates the relationship

among people, social systems (schools), and their use of ICT in order to understand how

they produce, reify and deconstruct each other. Critically-oriented thinking aides in the

exploration of the power of curriculum and teaching practices and the manner in which they are vital to social participation and knowledge production.

Critically-oriented thinking situates a vital conceptual commitment in researching the pursuit of more equitable technology integration. When the affordances of technology are not understood with this critical lens, modern practices of social participation and knowledge construction are barricaded from learners, often in relation to social markers of difference and the systems that maintain them. The frames of power, positioning and privilege are employed within this dissertation as practical and accessible entry points for technology integration equity work with in-service elementary educators.

Practical applications of critically-oriented thinking. Many educators and scholars claim they practice social justice *in* and *for* education. It is vital to identify how social justice is situated within and operates as part of a broader social commitment. This dissertation operates across philosophical, practical and narrative social justice conceptual commitments within the context of technology integration practices.

Philosophical social justice commitments, such as the scholarship of Bell (1997), Rizvi (1998) and Young (1990), aides in the understandings of how social justice functions both on individual and systemic levels. Philosophical social justice may be exhibited through having people clarify and describe assumptions, trace implications and conceptualize practices. Although these philosophical commitments were not made explicit in the research design or data analysis, these commitments helped me conceptualize systematic levels of social inequities in order to identify aspects of facilitating practical social justice professional learning and teaching.

The practical strand of social justice literature provides pragmatic educational practice models, competencies, and knowledge bases (Carlisle, Jackson, & George, 2006; Grant & Gillette, 2006; Hackman, 2005; Michelli & Keiser, 2005) that challenge marginalization and work towards creating more equitable learning opportunities. This literature is useful in facilitating educators' self-reflection, an openness to change and actionable change processes in education. While this strand of literature is critiqued for being decontextualized and undertheorized (Hytten & Bettez, 2011), when it is paired with philosophical and narrative social justice approaches, it fills the logistical "What do I do now?" void felt by teachers after awareness is developed. In this research, aspects of Jones' (2006) social class and critical literacy scholarship were used as pragmatic tools within the professional learning experiences (discussed in Chapter 5).

Unlike the philosophical and practical social justice approaches, narrative literature focuses on portraits of inequities in education and educators' personal reflections. This approach depicts compelling accounts of everyday injustices (e.g. hooks, 1994; Ladson-Billings, 2008; Valenzuela, 1999) as an invitation to reflect upon and commit to social justice action in education. Personal accounts and reflective stances in this body of literature, in conjunction with philosophical and practical approaches, hold immense potential for engaging educators and encouraging action through reflective practice and 'speaking back' in the crafting personal narratives. For this reason, narrative social justice commitments offered an aspect of storifying experiences as an invitation for educators to reflect upon and interrogate technology integration in relation to equity in education.

Summary of Conceptual Commitments Chapter

Equity as the pursuit of fairness for diverse people is explored in this dissertation through the frames of power, positioning and privilege. This research has many conceptual commitments in order to research the pursuit of more equitable technology integration in elementary education. Utilizing Zhao and Frank's (2003) ecological perspective of technology integration, epistemological pluralism and critically-oriented thinking may be conceptualized as invader species within the technology integration ecosystem. Post-intentional phenomenology is used to capture the fluid, malleable and permeable constructions of the phenomenon. In this way the conceptual commitments of this dissertation are used to explore how people, social systems and uses of technologies produce, reify and deconstruct each other. Accordingly, this dissertation positions critically-oriented thinking, post-intentional phenomenology and epistemological pluralism as conceptual underpinnings. These conceptual commitments facilitated the inquiry into the productions and provocations of pursuing more equitable technology integration through a post-intentional phenomenological research approach.

Chapter 5: Post-Intentional Phenomenological Research Approach

This research study uses a post-intentional phenomenological research design. This chapter details the approach used in order to delve into the phenomenon of pursuing more equitable technology integration within elementary education spaces as it is intertwined with social markers of difference, knowledge, society and power.

Research Design: Post-Intentional Phenomenology 2.0 Process

This phenomenon was researched employing Vagle's (2018) post-intentional phenomenology using a five-component process:

1. Identify a post-intentional phenomenon in context(s), around a social issue;

2. Devise a clear, yet flexible process for gathering phenomenological material appropriate for the phenomenon under investigation;

3. Make a post-reflexion plan;

4. Explore the post-intentional phenomenon using theory, phenomenological material, and post-reflexions;

5. Craft a text that engages the productions and provocations of the post-intentional phenomenon in context(s), around a social issue (p. 139).

I have termed this process as 2.0 to indicate (a) the most recent iteration by Vagle in 2018 and (b) my applications of this methodological design. By employing a post-intentional phenomenological approach, it is important to note the non-linear aspects of this research. So, while outlined in a linear manner for clarity purposes, each component of the process was engaged through constant interrogation in a cyclical manner as the phenomenon was

produced and provoked. Throughout the design and conducting of the research, I worked

back and forth across these methodological components.

Component 1: Identify a post-intentional phenomenon in contexts, around a

social issue. In all phenomenological research approaches, the phenomenon is

considered the unit of analysis. In post-intentional phenomenology 2.0, the phenomenon

is not only situated in its context(s), but it is also positioned as a social apparatus (Vagle,

2018). Therefore, the phenomenon is conceived as existing among, and being produced

and provoked through, dynamic social entanglements via "lived experience[s],

discourses, habits, policies, practices, contexts, histories, language, art forms, popular

media, politics, objects, etc." (Vagle, 2018, p. 140). This research investigated

productions and provocations of the phenomenon as a social issue.

Situate the research problem and partial review of the literature. Literature was

utilized to situate the social issue rather than provide evidence to support the study and its

findings. In this methodology, a partial review of the literature orients the researcher

without compromising openness to the phenomenon; "Although tracing existing literature

seems to make good common research sense, in phenomenology it can put at risk the

phenomenologist's philosophical and methodological commitment to remain as open as

possible to the phenomenon" (Vagle, 2018, p. 79). In Chapter 2, I traced the historical

underpinnings and understandings as well as societal factors of technology use in K-12

classrooms to offer an overarching perspective, and then situated the phenomenon in the

digital divides as an equity issue in education in Chapter 3.

Theories I chose to think with. In addition to a partial review of the literature, I also identified the conceptual commitments, philosophies and theorists to think with (Jackson & Mazzei, 2012) in this research. Jackson and Mazzei (2012) treat theory as an act that is fluid and multiple when engaging with data. Given post-intentional phenomenology's commitments to openness, then "reading-the-data-while-thinking-the-theory as a moment of plugging in, of entering the assemblage, of making new connectives" (Jackson & Mazzei, 2012, p. 4) is useful to incite productions and provocations of the phenomenon. Therefore, in considering the in-between-ness of post-intentional phenomenological research where sense-making happens "in between [the] researcher/researched; data/theory; and inside/outside" (Jackson & Mazzei, 2012, p. 11), the process of thinking with theory made it possible to use theoretical concepts as a generative act in the exploration of the phenomenon.

The conceptual commitments, philosophies and theorists I thought with during this dissertation helped me capture moments of intensities in the productions and provocations of the phenomenon. Specifically, I used *technology integration as an ecosystem* (Zhao & Frank, 2003), *epistemological pluralism*, *phenomenology* and *critically-oriented thinking* as theoretical tools to think with. Additionally, intensities in the phenomenological materials drew me to also think with *figured worlds* theory (Gee, 2011, 2014), Kumashiro's (2002) conception of *Othering*, and *social practice* theory (Fairclough, 1992). These conceptual commitments, philosophies and theorists to think with were used generatively, and circulated through each component of the research process.

Context(s). Determining the context of a project is always important in post-intentional phenomenology; for this research, which emphasizes social change, the shift to post-intentional phenomenology 2.0 was especially meaningful. Post-intentional phenomenology 2.0 focuses on social change which means that my analysis focuses on the conceptual commitment of the phenomenon "[being] shaped, produced, and provoked by context" (Vagle, 2018, p. 145) rather than situating the phenomenon in context(s). A post-intentional phenomenologist must *persistently critique* (St. Pierre, 1997; Vagle, 2018) and be responsive to context(s) in relation to the productions and provocations of the phenomenon in its shifting and changing form. To this end, context in post-intentional phenomenology 2.0 encompassed broad aspects (social norms and assumptions, dominant narratives, policies) as well as local aspects (places, embodiments, situations, and moments) as multiple, partial and shape-shifting.

The broad and local aspects were considered in the investigation of the phenomenon through in-service elementary educators' participation in a professional learning cohort. Participants engaged in a research design of three phases: professional learning cohort, interview, interview follow-up. Following an invitation to participate (see Appendix B), an informational conversation and the research consent process (see Appendix C), elementary educators participated in a series of three professional learning cohort meetings facilitated by me between November 2017 and January 2017 for a total of 7.5 hours. As a learning community we engaged in semi-structured discussions and activities around equity work in education and teaching and learning with technology (e.g. topics included: digital divide; digital usage divide; technology integration; race,

social class and gender in the classroom; anti-bias education; ICT for social justice; technology integration beliefs and practices). Participants were invited to collectively or individually participate in shared readings/media, discussions, journaling, artifact creation both during and in the time between cohort meetings. Details about the centering quotes/concepts, professional learning experiences, literature/media used for each cohort meeting are outlined in Appendices F, G and H. At the conclusion of the professional learning cohort, phase two consisted of each participant sharing their experiences in an individual conversational interview with me between December 2017 and January 2018 for no more than one hour (see Appendices I, K and L). The purpose of the interview was to explore more equitable technology integration through their experiences and reflections. Many participants shared an artifact from their teaching or reflective practice (see Appendix J). In phase three informal dialogue occurred in follow-ups interviews with participants between January 2018 and May 2018 via email, texts and face-to-face chats to clarify statements and discuss the evolution of their thinking that may have occurred since the professional learning cohort.

Given the emphasis on context with an explicit focus on social change, the selection of participants for the professional learning cohort was of particular importance. The phenomenon in this study was more likely to manifest in school contexts with significant markers of difference when compared to normed white, middle class ways of being. So, this dissertation drew upon educators' experiences from diverse elementary school contexts. The initial research design identified one specific elementary school community in which I would facilitate professional learning for the entire staff and then

draw research participants from this school context with its social norms, discourse, policies and practices. Due to a situation outside of my control, a revised research design (approved by co-advisors and IRB with input from a committee member) was constructed. In this design, participants were selected from several elementary school contexts which served first-ring suburbs with racially- and socioeconomically-diverse demographics. Participants were invited from contexts across three school districts and four elementary school communities (pseudonyms used) (see Table 5-1 for demographic data) (Minnesota Department of Education, 2017).

Figure 5-1. Participants' district and school demographics.

District	School	Grades	# of Licensed Staff	# of Students	Students of Color	Free/ Reduced Lunch	ELL Services	SPED Services
Compass Public Schools	Mississippi Elementary	PK-5	41	519	77%	76%	30%	17%
Compass Public Schools	Sunnyside Elementary	PK-5	36	484	75%	80%	34%	14%
Bell Community Schools	T.O.D. Elementary	PK-5	67	1,106	88%	80%	24%	12%
Rhodes Area Schools	South Hampton Institute of Technology	PK-5	25	444	67%	69%	15%	11%

Context related to dominant policies, practice, discourses and social norms were considered in the identification of these school communities in which the phenomenon might be produced, provoked and take shape. In addition, "spaces, places, embodiments, situations, and moments, all of which are partial and fleeting" (Vagle, 2018, p. 145) were also taken into consideration. The professional learning cohort, conversational interviews

and participant follow-ups took place across a variety of contexts: the researcher's home, a community library, a local coffee shop, participants' classrooms (after school) and electronically (via email, text, FaceTime, and phone). These contexts are important to name as they may have produced and provoked participants' comfort and engagement with the phenomenon. For example, when talking about the experience of being in a professional learning cohort, Kai shared, "I think it helped being in a home, sitting on a couch and being relaxed. If you're physically relaxed and comfortable, I feel like it's a little easier to feel at peace with speaking up or sharing" (Kai's interview, 12-27-17).

Social Change. Social change in post-intentional phenomenology 2.0 is considered to be a "concept/commitment/goal that needs to be articulated and explicitly located and named" (Vagle, 2018, p. 146). In this dissertation, I use digital divides and technology integration as two central concepts in the pursuit of more equitable technology integration in elementary classrooms. Other opportunities for social change become visible through the ways in which educators were prepared for the field and supported in ongoing technology integration professional learning related to their particular context(s). In these ways, the post-intentional phenomenological research approach evoked social change in education.

Statement of the Phenomenon: The phenomenon, research questions and participant selection. The pursuit of more equitable technology integration phenomenon aimed to better understand technology integration equity work in elementary education as it is experienced dynamically through intensities (Deleuze & Guattari, 1987) in contexts, discourses, practices, policies, social norms, assumptions, spaces, embodiments,

situations, moments and any other manifestations in context (Vagle, 2018). Most notably, the phenomenon was viewed as a social apparatus that both represents and constructs entanglements and intensities in elementary classrooms, school systems and society. For instance, the phenomenon represented and constructed entanglements in discourses and practices around perceived roles of educators with technology (Kai's interview, 12-27-17), in the questioning societal impacts of technology integration (Olivia's interview, 12-30-17), through disrupting discourses that Other learners (Rachel's interview, 12-12-2017), and in conceptualizing technology uses as an invader species (Eddie's follow-up, 2-25-18).

As an element of this component, I used Vagle's (2018) structure for post-intentional phenomenological inquiries: "*How might (the post-intentional phenomenon) take shape (for whom) in (what context)?*" I crafted one primary and two supporting research questions:

Primary research question. Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in diverse school communities?

Supporting research questions. What are some of the underlying technology integration beliefs and practices at work, if any? In what ways, if any, do the lived experiences of in-service educators evolve throughout involvement in professional learning experiences?

Participant selection and details. Educators needed to meet criteria in order to be participants in this study. First, reliable access to hardware/software and Internet in the

school site are essential to moving beyond the investigation and reification of the initial digital divide. While there was no specific device type or student-to-device ratio required, participants needed to have regular and reliable access to devices for their learners. Further it was essential that participants were afforded some professional autonomy in instructional decision-making with regard to integrating technology - including the how, when and why technology is integrated into teaching and learning experiences.

Second, participants needed to have foundational technology and ICT proficiencies as far as functional operations and productivity (e.g. ISTE Standards for Teachers, 2018; United Nations Educational, Scientific and Cultural Organization Competency Framework for Teachers, 2011). While participants were not assessed on their functional operation of technologies, the process of recruiting participants took into consideration functional technology use.

Next, participants were welcomed from a range of years in classroom teaching experience - from newly in-service to end-of-career educators. These criteria were used to recruit both participants who were grounded in their profession and those who were just getting started in their careers.

In order to facilitate rich discussion during the professional learning cohort, participants were recruited from diverse communities and teaching contexts from a variety of grade levels, school communities and school districts. This research study included six cohort participants (see Table 5-2).

Figure 5-2. Participant details with pseudonyms selected by participants.

Participant	School	School District	Grade	Years of Teaching
Claire Mattson	Sunnyside Elementary	Compass Public Schools	5	10
Eddie Flugelhorn	South Hampton Institute of Technology	Rhodes Area Schools	5	19
Kai Kelly	Mississippi Elementary	Compass Public Schools	1	15
Olivia Winnetka	T.O.D. Elementary	Bell Community Schools	2	18
Rachel Ramgren	Sunnyside Elementary	Compass Public Schools	3	8
Wade James	T.O.D. Elementary	Bell Community Schools	4	9

Each participant brought their own invaluable perspectives and experiences to the professional learning cohort conversations and phenomenon. The following brief participant descriptions help portray the multi-dimensionality of the professional learning cohort members. Then, participant demographics are synthesized and put into perspective with statewide elementary educator demographic data.

Claire Mattson is a fifty-two-year-old, upper-middle class white female. She earned her Master's degree in an initial licensure program. She is a member of the school- and district-based technology committees. Claire aims to conclude her career in education as a district-level technology integrationist. Claire's classroom contains 1:1 ChromeBooks in its learning studio and regularly uses Google Classroom and multiple online technology tools (e.g. DreamBox, NearPod).

Eddie Flugelhorn is a forty-four-year-old male person of color. This is his first year at South Hampton Institute of Technology. In his educational career, Eddie has taught in four local school districts, across many markers of difference, in both classroom teaching and instructional coaching roles. He has earned his Master's degree and

administrative license. Eddie participates in many equity-focused professional learning

opportunities and has facilitated professional development internationally as an

International Baccalaureate trainer. He also takes up many leadership roles within his

school community (e.g. lab classroom teacher, instructional leadership team

member). Eddie's classroom is equipped with 1:1 ChromeBooks, a SmartBoard and

Schoology.

Kai Kelly is a thirty-nine-year-old educator who identifies as straight, middle

class, white and female. She is in her first-year teaching at Mississippi Elementary, as

well as her first year in Compass Public Schools. Kai has taught in five different local

school districts. She has earned her Master's degree. Kai's classroom has a small group

set of iPads and an interactive whiteboard. She also has regular access to a class set of

ChromeBooks.

Olivia Winnetka identifies as a straight, white and middle-class forty-year-old

female who has been an educator for eighteen years. She has taught Kindergarten, first,

second, and fifth grades. She has earned her Master's degree and has experience with the

International Baccalaureate Primary Years Programme, as well as National Urban

Alliance, Reading First and STEP (Urban Education Institute at the University of

Chicago) trainings. Olivia will transition from classroom teaching into an instructional

coach role in the upcoming academic year. Olivia's classroom has four student iPads and

one teacher iPad. She has an Apple TV, LCD and doc cam for instructional use. The

management of technology devices - including selection, syncing and updating of apps -

is highly regulated by the school district. There are two class sets of iPads and two class

sets of MacBooks available for limited check out from school library with strict

regulation of use (frequency and learning purpose). Olivia is experiencing a district-wide

transition from the International Baccalaureate Programme to a STEAM program.

Rachel Ramgren is a thirty-year-old, female educator who identifies as straight,

white and middle class. She has earned her Master's degree in critical literacy and is on

the equity committee/leadership team at her school. Rachel's classroom has 1:1 iPads, as

well as multiple LCD projectors and SmartBoards throughout her learning studio which

is an open grade-level that houses three classes. Rachel co-teaches in the learning studio

with two other grade level teachers, two teacher candidates, an English language teacher

and a variety of educational and behavioral support staff. Additionally, Rachel and her

co-teachers utilize district resources (e.g. Google goggles) for virtual field trips and other

technology-enhanced learning experiences.

Wade James is a straight, middle class, white, thirty-two-year-old male educator

who earned his Master's degree while earning his teaching license. Wade began teaching

as a literacy specialist and transitioned into classroom teaching early in his career. He

has taught second, fourth and fifth grade. Like Olivia, Wade is experiencing a district-

wide transition from the International Baccalaureate Programme to a STEAM program in

which he is no longer a self-contained classroom. Wade has a teaching partner who

teaches both classes English and social studies while he teaches both classes math and

science. In addition to Wade's classroom having four student iPads, one teacher iPad, an

Apple TV and an LCD for instructional use, Wade sought special permission to check out

a classroom set of devices during the professional learning cohort in attempts to deliver a

modified flipped classroom. The management of technology devices mirrors that of Olivia.

State-level educator statistics and individual participant demographics offer contextual grounding for the phenomenon, making visible aspects of participants' privilege and markers of difference as it circulated through social systems (elementary classrooms, school systems and society). For example, while all of this study's participants have earned their Master's degrees, in the state of Minnesota, 53.8% of K-12 educators have earned Master's degrees (Minnesota Department of Education, 2017b). The Minnesota Department of Education (2017c) reports that 4% of K-12 educators identify as an educator of color compared to 17% of the participants in this study identify as an educator of color. Educator gender identity demographic data for elementary educators in the state of Minnesota is hard to come by: Kent (2007) indicates a mere 9% of elementary educators identify as male. One-third (33%) of participants in this dissertation identify as male elementary educators. Finally, class markers are relevant to this study; 83% of participants identify as middle class and 17% identify as upper-middle class. Through providing contextual information about the state, and synthesizing an overarching view of the participants in the professional learning cohort, the multi-dimensional identities and privileges that may impact participants' perspectives and experiences related to the phenomenon are acknowledged.

It is important to note that I had prior relationships with participants through my teaching networks. In addition, participants began the cohort experience having a professional relationship with at least one other participant in the study. These research

design decisions fostered a space in which some level of comfort and familiarity

precipitated the critically-oriented technology integration learning in the cohort.

Component 2: Devise a clear, yet flexible process for gathering

phenomenological material appropriate for the phenomenon under investigation.

Due to the responsibility to work with and question our assumptions, this dissertation

explores rhizomatic entanglements, productions and provocations around equity and

technology integration in elementary education. An openness to phenomenological

materials and flexibility in the gathering of them in co-construction, as the phenomenon

calls for them, is an essential position for researchers. Primary and supporting

phenomenological materials for this study have been identified and aligned to the

research questions (see Table 5-3).

Figure 5-3. Research questions and phenomenological materials alignment.

#	Primary Post-Intentional Phenomenological Research Question	Phenomenological Materials
1	Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?	Primary: ● Participants' cohort artifacts ● Interviews Secondary: ● Researcher's cohort artifacts ● Researcher's post-reflexivity journal ● Participant follow-up
#	Supporting Post-Intentional Phenomenological Research Questions	Phenomenological Materials
2	What are some of the underlying technology integration beliefs and practices at work, if any?	Primary: ● Participants' cohort artifacts ● Participant follow-up Secondary: ● Interviews ● Researcher's post-reflexivity journal ● Researcher's cohort artifacts
3		Primary:

		● Interviews
	In what ways, if any, do the lived experiences of in-service educators evolve throughout involvement in professional learning experiences?	Secondary: ● Researcher's post-reflexivity journal ● Participant follow-up ● Participants' cohort artifacts ● Researcher's cohort artifacts

In addition, the flexible process for gathering the phenomenological materials through this professional learning cohort was articulated and lived through. Phenomenological materials were used to consider, explore and theorize potential productions and provocations of the phenomenon. Each phenomenological material type is described and supported with methodological notes.

Participants cohort artifacts provided insights into the lived experience of engaging in technology integration professional learning and self-reflection anchored in equity (see Table 5-4). The cohort gatherings provided space and reflection opportunities to explore how the phenomenon was produced and/or provoked in the participants' identities, pedagogies/practices, language in use, social justice commitments, social practices, and critical lenses. Cohort gatherings were primarily semi-structured discussions and activities regarding the phenomenon. They opened with a post-intentional phenomenological question (e.g. What has it been like to reflect on your technology integration practices?). At times participants opted to collectively or individually create artifacts to aide or communicate their understandings and experiences. Cohort phenomenological materials were used to explore instances that produced and/or provoked the phenomenon by providing access points to understand the participants' lived experiences as they engaged in critical self-reflections related to (1) equity work in

education and (2) teaching and learning with technology.

Figure 5-4. Phenomenological materials – Participants' cohort artifacts.

Phenomenological Materials	Details
Participants' cohort artifacts (3 meetings)	• Cohort creations and image documentation (participant/cohort-initiated creation of product(s) such as lists, drawings, videos, anchor charts, etc.) • Participant journals (Notebook: lived experience written reflections, notes, drawings, representations, chronicling, lists, drawings; Virtual: lived experience video and audio reflections via Flipgrid) • Cohort artifact sharing (from teaching or reflective practice) was optional. • Ongoing cohort professional learning artifacts (participants opted to individually/collectively participate in shared readings/media, virtual discussions, journaling, artifact creation, artifact sharing in the time between cohort gatherings)

The researcher's cohort artifacts served as an initial grounding for technology integration professional learning and critical self-reflection anchored in equity as they were experienced by the participants (see Table 5-5). Artifacts included discussion and activity prompts (e.g. technology access and usage identification; technology integration experiences drawing and quick writes; "who I am…" identity representation; living in and through the 3Ps; digital divide/participatory technology integration reflection; vision for my learners; vision for technology integration) (see Appendices F, G and H). Ongoing researcher post-reflexing and analysis explored how these relations and intentionalities may have sparked the production and/or provocations in and through the phenomenon.

Figure 5-5. Phenomenological materials – Researcher's cohort artifacts.

Phenomenological Materials	Details

Researcher's cohort artifacts (3 meetings)	• Cohort discussion and activity audio recordings and transcriptions
	• Cohort discussion and activity video recordings and transcriptions
	• Cohort discussion and activity image documentation
	• Cohort materials:
	  ○ Website (resource hub for presentation materials, readings and media, cohort gathering details, contact information, etc.)
	  ○ Slides
	  ○ Handouts
	  ○ Readings
	  ○ Media
	  ○ Agendas
	  ○ Discussion prompts

| | ○   etc. |
| | ●   Cohort field notes |

This research employed the 'interview as a social practice' (Talmy, 2011) stance and treated the interview as a social practice that problematized assumptions and facilitated analyzing the 'whats', 'whys' and 'hows' as a source of knowledge production. The interviews provided space and reflection opportunities to explore how the phenomenon is produced and/or provoked in their beliefs, pedagogies/practices, language in use, equity commitments, social practices, and critical lenses. This phenomenological material was used to explore instances that produced and/or provoked the phenomenon by providing access points to understand the individual participants' lived experiences as they engaged in critical self-reflections related to (1) equity work in education and (2) teaching and learning with technology (see Table 5-6).

Figure 5-6: Phenomenological materials – Interviews.

Phenomenological Materials	Details
Interviews (1 interview)	● Interview audio recordings and transcriptions ● Interview recordings ● Interview artifact image documentation (artifact selected by teacher from teaching or reflective practice and shared in interview) - optional, determined by participant ● Interview protocol ● Interview prompts ● Interview field notes

The follow-up conversations with participants were facilitated and collected as phenomenological material (see Table 5-7). They provided opportunities for participants to clarify statements made in the interview, or in other phenomenological materials. This material also explored any evolution of thinking that may have occurred since the conclusion of the professional learning cohort gatherings. Participants were given an

opportunity to ensure accurate representations and note shifts in their productions and/or

provocations of the phenomenon.

Figure 5-7. Phenomenological materials – Participant follow-up.

Phenomenological Materials	Details
Participant follow-up (varied, ongoing)	• Follow-up inquiries • Follow-up correspondence (e-mail, phone, letters, Flipgrid videos, etc.) • Follow-up field notes • Follow-up audio recordings and transcriptions • Follow-up recordings • Follow-up artifact image documentation

The researcher's post-reflexivity journal was the final phenomenological material

collected (see Table 5-8).   This material provided a consistent interrogation of the

researcher's pre-understandings to explore personal experiences as they related to the

phenomenon during planning, delivery, material collection and analysis. Post-reflexivity

journal entries noted moments of intrigue, perplexion or shock. Post-intentional

phenomenologists utilize this space to question knowledge, beliefs and/or assumptions

that frame experiences, assumptions and bottom line commitments regarding the

phenomenon. Post-intentional phenomenology highlights this practice as an essential

element in the research process. This post-reflexing was used as a collection to

continuously revisit.

Figure 5-8. Phenomenological materials – Researcher's post-reflexivity journal.

Phenomenological Materials	Details
Researcher's post-reflexivity journal (ongoing)	• Weekly post-reflexivity journal entries (written reflections, notes, drawings, representations, chronicling, lists, drawings, anchor charts, quotes, wonderings) • Voice memos • Post-reflexion on phenomenological materials analysis

Component 3: Make a post-reflexion plan. Post-reflexivity is an analysis

method that is situated in Lather's (1993) work to 'see what frames our seeing' as a

relational process to explore the evolving knowledges that are at work (Vagle & Hofsess, 2016). Post-reflexion is the researcher's consistent interrogation of their pre-understandings and analysis happening "before, during and after phenomenological material is gathered" (Vagle, 2018, p. 153). The post-reflexivity journal is the space where the researcher explores their personal experiences as they related to the phenomenon during planning, delivery, phenomenological material collection and phenomenological material analysis. Essentially, post-reflexion is a process to be explicitly attuned to thinking and embodied responses regarding the research.

Post-reflexion assists researchers in "uncover[ing] underlying, shifting, changing knowledges that are at work in all intentional relations" (Vagle, 2018, p. 154). I utilized post-reflexion as a process to not only interrogate my pre-understandings of the phenomenon, but also explore developing understandings of how the pursuit of more equitable technology integration was experienced and took shape. In my post-reflexivity journal, I situated myself with a reflective stance. For example, at times my post-reflexion journal supported the methodological processes of conducting post-intentional phenomenological research (see Figure 5-1), and other times my post-reflexion journal was a space for me to think through the intensities that were bubbling up in the phenomenological materials (see Figure 5-2). I also post-reflexed using tools such as Voice Memos.

Figure 5-9. Thinking --> <-- Methodology.
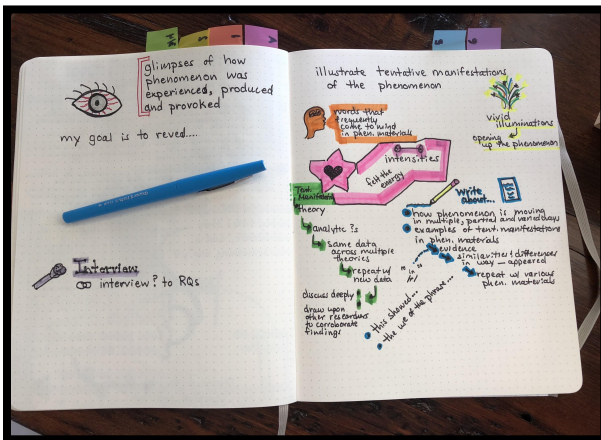
Figure 5-10. Being and becoming.
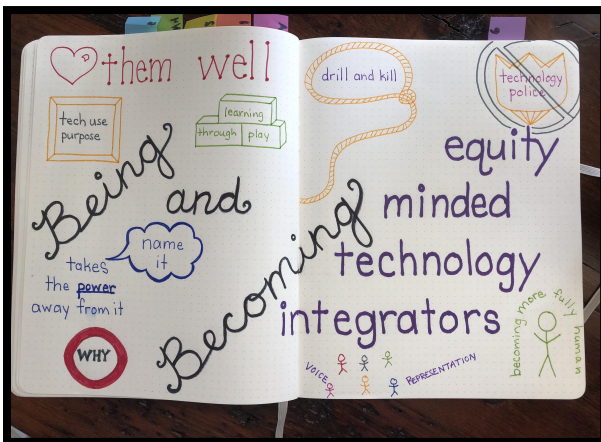
Throughout the research I used the post-reflexivity journal as both a physical and virtual

space to "wonder, question, think, contradict [my]self, agree with [my]self, vent, scream,

laugh, and celebrate" (Vagle, 2018, p. 155). In these spaces, I worked in a non-linear

fashion organizing the post-reflexions in a variety of ways (e.g. by concept, chapter and

analytic 'sticking spots').

    Initial Post-Reflexion Statement. In post-intentional phenomenology,

researchers craft an initial post-reflexion statement. In this statement researchers often

describe their roles, assumptions, perspectives and background related to the

phenomenon under investigation. Additionally, researchers should "begin to try to see what frames [their] seeing - that is, [their] connections/disconnections, assumptions of normality, bottom lines, and what shocks [them]" (Vagle, 2018, p. 155). This process is intended to open up and explore my influence on the phenomenon. The initial post-reflexion statement is to be revisited as it is a working document to engage with through the entire methodological process.

I crafted an initial post-reflexion statement which situated my initial perspectives of technology integration in elementary schools and sought to unpack 'what frames my seeing' in equity/social justice anchored technology integration (see Figure 5-3).

Figure 5-11. Initial post-reflexion statement.

Years back, I was a teacher who integrated technology into my Kindergarten classroom. We had a computer station with 4-6 desktop computers, a handful of iPods, a SmartBoard, a classroom website, a document camera, LCD projector, sound system to name what I can recall at this moment. Additionally we would round up laptop computers as they were available. Note I say we to indicate that much of my teaching was co-teaching with my Educational Assistant (who was in the process of earning her teaching license) and the combination of student teachers, practicum students, and push-in reading specialists along with a variety of volunteers.

Each day/throughout the week learners would have the opportunity to use technology during their "station time" and our "remediation/enrichment time". I set student up with websites, apps, tech tools that I thought met their targeted areas in need of growth. While some students created recordings of books (working on fluency and also creating recordings to make some texts accessible to other readers in our class), many were on web based games.

I remember feeling 'ick' for lack of a better description. I knew I was using more tech than many of my peers, but something felt off.

Fast-forward. I taught 3rd grade - larger gaps in literacy, mathematics, life were apparent. I had more unsupported (meaning our IT folks would not support the devices, repairs, Internet, updates, etc.) technologies than I did in Kindergarten, including access to a class cart of laptops shared amongst three classrooms. We now had Reading A-Z accounts for each learner, and began working with presentation type software.

Fast-forward again. The year I taught as a "Technology Specialist" and part time as a "Literacy Specialist". I now saw Kindergarten, First Grade and Third Grade students. This was a new position. I had access to a full class laptop cart and a full class iPad cart. I was able to design the curriculum - including selecting of the tools, apps, software, etc. I had the Promethean Board removed. It was not conducive to primary learners nor was the placement even accessible. Instead we used Stage, Skitch, Explain Everything and the Apple TV... when it worked. The goal was to use more of an inquiry approach to building digital literacies (although I didn't have the digital literacy language at that time) and enhance an IB planner from each grade level. We started from square one - how to hold, carry, open, turn on, login, shut down, etc. - and this was shockingly painful. Mid year we finally got to a point where students were exploring how to use tools to create something to show what they knew. As we (my fellow Tech Specialist) and I hit many roadblocks and addressed many misconceptions. We were not there it teach typing. We were not there to create online standardized assessments to speed up grading time. We were not there to fix classroom teacher's tech. We were there to lay some foundational skills and strategies so teachers could more readily integrate technology into their classroom instruction. Many pushed this off as they get it with you so I don't need to learn or use any of this. We met with teams, tried to coach spaces with what they learned in our class could be applied in their class. This was not often well received. So we took on some summative IB planner projects to foster teacher 'buy in'. The more we tried to do this the less the class became about students creating instead of consuming content. I didn't know why but I felt pretty passionate about students creating things using technology. Come spring, given lack of support and lack of

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school's investment we suggested with pending budget cuts to nix the program. At which time I left the school/district and began my PhD journey.

   I recall sitting in 8133 with Dr. R, my brain drowning in all of the this I didn't know. Feeling significantly ill prepared to be a PhD student, scholar and writer. Recognizing that my undergraduate and Master's programs in no way set me up for success. Listening to D (fellow LT PhD student), who was near the end of their coursework rattling off all things LT, and methodological, and conceptual, and theoretical.

   I. Was. Lost.

   I began working on my first graduate paper and coming across an older quote from Baker and Baker about the discrepancies in how technologies are used in classrooms based upon socioeconomic factors. Essentially their research found that in higher income schools tech was used in ways where students were creating things, sharing things in online spaces, using tech to connect with the world, opening their perspectives and sharing their voice. These students had agency in their learning journey and the resources to support it - ultimately opening many doors for them. Whereas the lower income schools - who had access to regular and reliable technology - were using it for remediation. Basic drill and kill activities dominated students' experiences with technology. I was like yes - a fire burned within.

   Then I paused. I felt sick to my stomach. I realize that during my time in the classroom this was exactly how I integrated technology. It was what I knew how to do. Then the devastation hit when I thought about how many learners over how many years I had limited their learning opportunities. As I thought about how I perpetuated the gap I was both angered and drawn to this topic - the digital divide.

   Now I when look back at that very first paper I first want to reach out to Dr. R and apologize for my awful and painful attempt at writing and second I see a space of intrigue. This space and feeling of ick has sparked much of my journey and shaped a great deal of my thinking - as an academic and as a teacher.

   This statement was revisited throughout the study with notes in the margins as I further interrogated what framed my perspectives and perceptions. I questioned my technology integration practices in the classroom. I assumed everything I had done was *wrong*. I struggled with a feeling of *not-enoughness* (Hughes-Decantur, 2011) and feeling like an imposter. I perceived exploring the phenomenon just as much about my journey as it was about the journey for my participants. I shared my story in one of our cohort gatherings in what I assumed would be a moment of questioning my positioning in our work together. I noted later the moment was taken up in a humanizing way - as being a member of the community. It was moment of ease and situated me as a peer who strives to improve their craft and encounters bumps in the road (addition to the Initial Post-Reflexion Statement on 12-8-17). I noted that challenging my assumptions not only led me to greater openness with the phenomenon, but the experience also put my

assumptions explicitly to work where they lived, breathed and took on a life of their own (addition to the Initial Post-Reflexion Statement on 1-14-18)

 Post-Reflexion Journal. The post-reflexion journal served as a space for consistent interrogation of the pre-understandings and to explore personal lived experiences as they relate to the phenomenon during planning, facilitation of professional learning experiences, phenomenological materials collection, phenomenological materials analysis and writing. Specifically, post-intentional phenomenologists utilize post-reflexions as spaces to question knowledge, beliefs and/or assumptions that frame experiences, assumptions and bottom line commitments. In post-intentional phenomenology 2.0, Vagle (2018) shared that, as "craftspeople, it is important to pay attention to:

1. Moments when they/we instinctively **connect** with what they/we observe and moments in which they/we instinctively **disconnect.**

2. Our **assumptions of normality.**

3. Our **bottom lines,** that is those beliefs, perceptions, perspectives, opinions that we refuse to shed; and

4. Moments in which they/we are **shocked** by what they/we observe. (p. 154, emphasis in original)

Ongoing post-reflexing held "promise in creating a more radical reflexivity that can begin to uncover underlying, shifting, changing knowledges that are at work in all intentional relations, and can begin to embrace post-structural arguments such as all-knowing being partial and fleeting." (Vagle, 2018, p. 154)

This post-reflexing practice was an essential element in the research process in probing what was produced and provoked in relation to the phenomenon. For instance, throughout my analysis post-reflexing occurred on whiteboards, post-its and chart paper (see Figure 5-4).

Figure 5-12. unOthering.
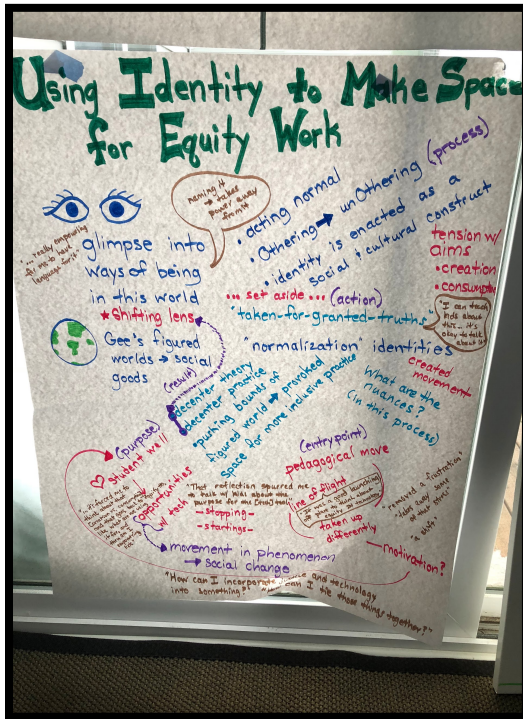
The post-reflexions were utilized as a collection to continuously revisit and interrogate. For instance, in the analysis process I post-reflexed moments of intensities in the phenomenological materials on post-its so that I could move them around in my sense-making process to understand how the phenomenon was taking shape (see Figure 5-5).

Figure 5-13. Post-it post reflexing.
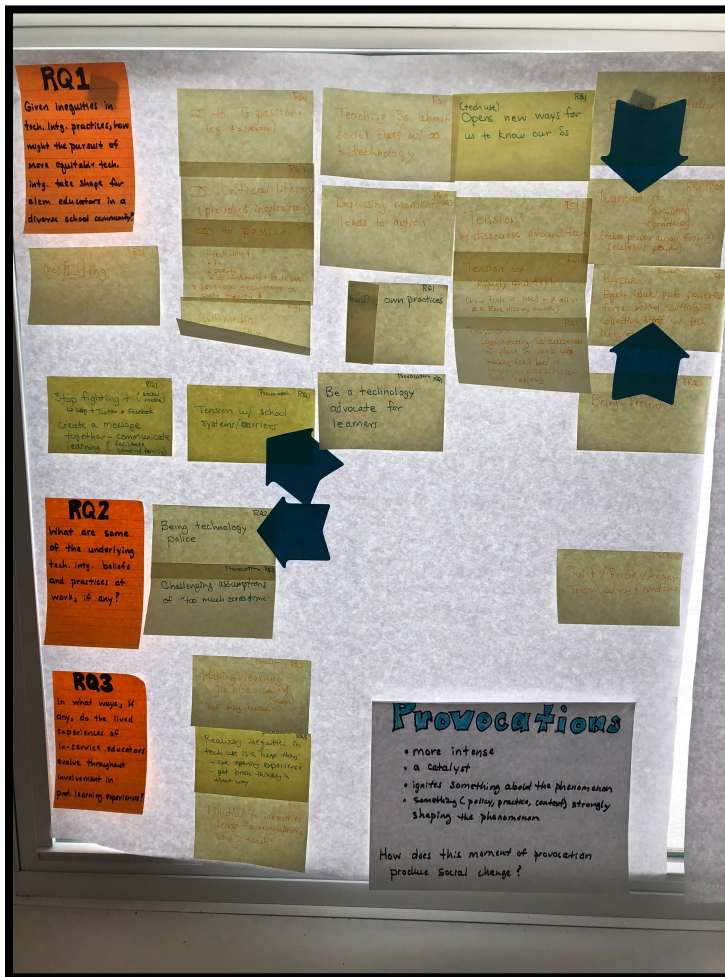
Post-reflexing pressed me as a researcher to situate myself as a historical and social being

in relation to others and the phenomenon. For example, at one moment I became so

entangled in my assumption that privileging multifaceted technology integration was a

path for social change that when I thought analytically with Fairclough's (1992) social

practices theory, I was stuck with an unyielding tension in how this assumption may

unwittingly marginalize multiple ways of knowing and being (RPRJ, 3-15-18, 3-26-18).

In this way post-reflexing served as a space to question knowledge, beliefs and

assumptions and explore how they influenced my experiences, assumptions, bottom line

commitments and interpretations.

     Researcher positionality. In this approach, the researcher is intertwined in every

aspect of the methodology, from identifying the phenomenon to analysis of the

phenomenological materials to crafting a representative text. To this end, I positioned

my role as a researcher to be a '*facilitator of productive struggle*'[21]. This position

recognizes my role in the design of the research, the facilitation of professional learning

and the analysis of the phenomenological materials as it moves through my intentional

relationships with the phenomenon. I also found Lincoln and Guba's (1998) idea that the

constructivist researcher is a *passionate participant* to be helpful. They suggest that

researchers need to recognize how their own lived experience shapes their interpretation

of the lived experience of others (as interpreted by Benson, 2012). Vagle (2010) takes

this notion one step further when he states,

> Whatever understanding is opened up through an investigation will always move
> with and through the researcher's intentional relationships with the
> phenomenon—not simply in the researcher, in the participants, in the text, or in
> their power positions, but in the dynamic intentional relationships that tie
> participants, the researcher, the produced text, and their positionality together. (p.
> 35)

In interpretative research, and more so in the post-intentional phenomenological research

approach, a researcher's positionality induces productions and provocations in the

contemplation of varied meanings and processes beyond the product itself. In this

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[21] *'Researcher of productive struggle'* is a phrase I have had jotted on a post-it which has hung on my
monitor screen throughout my time engaging in this work. It is not attributed to any specific scholar or
field to my knowledge. It is italicized here to indicate its importance to me personally as I lived in this
entangled body of scholarship.

approach to research the researcher's being is entangled and shape-shifting into fleeting multiplicities. The assumption is that the researcher lives through the phenomenon just as much as the participants. By making visible who the researcher is and how they enter this scholarly act influences the readers' understanding of the phenomenon and subsequent research results.

To this end, I, identify as a forty-year-old early childhood and elementary educator. I also embody the identities of teacher preparer, professional learning facilitator and researcher. Further, it is crucial that I name and understand my privileges - being white, straight, cisgender, female and middle-class. In the realm of elementary education, I am considered the norm, and systems of power, positioning and privilege in K-12 classrooms and schools often operate through these lenses and assumptions (e.g. whiteness, femininity, middle class). I strive to be an ally in challenging the incubation of whiteness and classist beliefs/practices in support of, and in collaboration with, communities that experience marginalization in education. The intent of this dissertation is to speak up but not speak over such communities - using my privilege and platform to share space and social opportunities. I recognize that my participants and I make mistakes as we unlearn problematic beliefs and practices which is one way I can educate myself and others. Thus, the sense-making in this dissertation was in dynamic relationships with the phenomenon, the participants and myself as the researcher. My whiteness, my femininity and my middle class understandings of the world are entangled in the interpretations of the phenomenological materials, theory and the phenomenon.

Component 4: Explore the post-intentional phenomenon using theory, phenomenological material, and post-reflexions. While several strategies can be practiced in the exploration of post-intentional phenomenological research, this study exercised a modification of whole-part-whole analysis. First, a careful holistic reading, watching and listening was done across the phenomenological materials. Next, theory was used to analyze deeply and dynamically across the phenomenological material in the analysis. In subsequent engagements with the phenomenological materials I noted intensities and post-reflexed in a responsive manner. Additional phenomenological materials, including post-reflexions, were then 'plugged in' to explore productions and provocations in relation to the phenomenon.

Part 1: Deconstruct the wholes of phenomenological material. While each element of the whole folds together in dialogic relations with one another, further analysis occurred through the deconstructing the wholes in order to investigate and visualize the fluid nature of the phenomenon and its rhizomatic constructions. Philosophically it is in this stage of the research approach that Deleuze and Guttari's (1987) lines of flight were used. For example, in Rachel's interview she described what is now named unOthering. There was an embodied moment of intensity during the interview as she reconceptualized what was normal in her students (RPRJ, 2-22-18) (discussed in Chapter 6).

Unanticipated noticings of powerful excerpts, questions, mis-fit notions, binaries, assumptions, bottom lines, hesitations and uncertainties were spaces to interrogate both the phenomenological materials and my influence on them. Being attuned to embodied

responses, or as Hofsess (2013) described them as *embodied intensities*, were opportunities to notice emerging, shape-shifting and fleeting productions and provocations. For instance, Rachel's embodied moment in her figured world (RPRJ, 12-12-18, discussed in Chapter 6) facilitated the exploration of social constructs being taken up that were barriers to her experience pursuing more equitable technology integration and how in this embodied moment she disrupted Othering discourse/practices. In these moments of noticings, I turned to post-reflexing Voice Memos. It was in these moments of the analytic process that I started to notice *lines of flight* intensities (Deleuze & Guattari, 1987). It was also in these moments where opportunities to explore the particular ways the pursuit of more equitable technology integration took shape, was produced in time and space, and was entangled and provoked.

At this point in the analysis process, follow-up participant inquiries were generated and facilitated in order to further explore clues for the interpretation and representation of the phenomenological materials. Subsequent readings, listenings, viewings and analysis notations were also conducted for aiding in the articulation of intensities that emerged, were produced or provoked. Reflective revising was incorporated through each step in the analysis process. To illustrate, I used the creation of charts and post-its as one of my iterative analysis processes which allowed me to move around, build up, interrogate, and think deeply about the productions and provocations (see Figure 5-7).

Figure 5-14: Reflective revisiting.

Part 2: Think with theory. Theories were a launching point in the next stage of the research approach. Informed by the phenomenological materials, I made decisions regarding which theories could extend and open up the phenomenon in compelling ways. Deep thinking, puzzling and problematizing of the phenomenon was the purpose of using theory at this stage in the analysis which prompted the utilization of additional theories (e.g. Gee's (2011, 2014) *figured world* theory, Kumashiro's (2002) conception of *Othering*, Fairclough's (1992) *social practice* theory) to facilitate analytic thinking. This aspect of the post-intentional phenomenological research approach is described in subsequent vignette chapters.

Part 3: Analyze post-reflexions. This phase primarily used the post-reflexivity journal and focused on accessing prior knowledge, assumptions and moments of intrigue, perplexion, connection/disconnection, shock or 'ah-ha' as it was produced and provoked. This phase, as articulated in subsequent vignette chapters, noted interpretative startings and stoppings.

Part 4: Iterative entanglement. Once initial productions and provocations of the phenomenon were unpacked, I worked across and through the phenomenological materials, thinking with theory and post-reflexions noting movements in the phenomenon. Jackson and Mazzei (2012) insist "plugging in [theory] creates a different relations among texts; they *constitute* one another and in doing so create something new" (p. 4). In my application of post-intentional phenomenology research approach 2.0, I used analytic questions to explore more deeply the vivid illuminations (i.e. findings, discussed in chapter 6) of the phenomenon was being produced, provoked and took shape (see Figure 5-8).

Figure 5-14. Analytic questions for exploring vivid illuminations.

Analytic Questions for Exploring Vivid Illuminations
Essential Analytic Questions:
1. How were movements in the phenomenon magnified through dialogic interplays?
2. How do the analytic "breathing spaces" (dialogic vignettes) shape the byproduct (vivid illuminations)?
3. Why does this matter?

Top Tier Supporting Analytic Questions:
4. How does positioning "unvoiced thoughts" generate a new/different way of seeing?
5. What happened when I de-centered, and therefore de-privileged, single focus points in the analysis?
6. How do multiplicities unfold/become visible?
7. What part(s) can no longer be separated and described independently?
8. What is generated by working across the analytic structures?

Lower Tier Supporting Analytic Questions:
9. What was produced through the dialogic interplay?
10. At what moments is the dialogic interplay harmonious? cacophonic?
11. Are there moments of embodied meaning-making in the dialogic interplay?
12. What did using these intellectual tools (conventions of comics) afford the analysis?
13. How did the positioning of comic conventions as equals produce/provoke the phenomenon/analysis?
14. As the analyst/reader works across the analytic structures flanking the page, what happened to meaning-making?
15. How is the phenomenon's fluidity being exposed?
16. In what ways, if any, are rhizomes constructed?
17. How might the different modes of thought shape (powerful) interpretations?
18. How did I work across and through the analysis in an iterative way?
19. How does working across the analytic structures influence sense-making?
20. What are the analytic structures telling me?

These analytic questions were used to explore what was produced when theory, phenomenological materials and post reflexions were analyzed together. At this stage,

the parts can no longer be separated and described independently. This iterative process amplified the rhizomatic constructions of the phenomenon as they were constantly in relation with the produced entanglement.

Component 5: Craft a text that engages the productions and provocations of the post-intentional phenomenon in context(s), around a social issue. Framed in the social issue of equity, the text represents the productions and provocations of the phenomenon in their multiple, partial, and varied contexts. Ultimately this text sought to "transform the lived experience into a textual expression" (Vagle, 2014, p. 136) in a manner that honors the non-linear constructs. While my attempts for a final crafted text in a non-linear form was limited due to the constraints of writing in Microsoft Word, the non-linear process of final analysis prior to crafting a text was not (see Figure 5-9).

Figure 5-16. Multi-layered textual analysis.
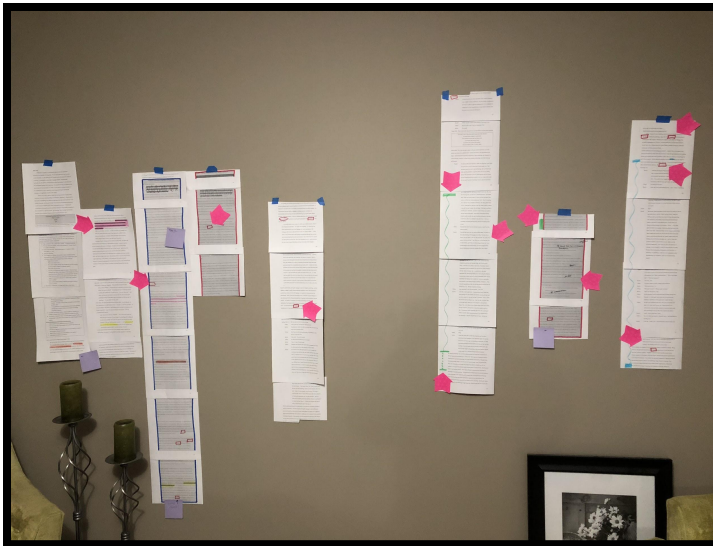
I wrote across and through the interpretations of complexities and entanglements indicated in the coloring, highlighting, post-it notes and layering of texts. During this

process I noted how the phenomenon's productions and provocations were entangled with movement towards social change. Subsequent findings are represented as vivid illuminations of the phenomenon. Vivid illuminations reveal productions and provocations of pursuing more equitable technology integration as they materialized with and through the participants. Three vivid illuminations (unOthering, Questioning Societal Implications and Achieving Homeostasis) are shared in the next chapters.

As readers partake in these vivid illuminations, they are invited to become part of the analysis - a phenomenon all on its own, not explored in this research. My hope for the reader is for this reading experience to become an extension of oneself, triggering further embodied and transformative representations of pursuing more equitable technology integration and aligning with the playful constructive nature of post-intentional phenomenology.

Chapter 6: unOthering - A Vivid Illumination of the Phenomenon

*"*NO ***PHILOSOPHIES****,*
NO ***MOVEMENTS****,*
NO ***WAYS OF SEEING***
ARE OUT OF BOUNDS!*"*

- Scott McCloud, in *Understanding Comics: The Invisible Art,*
1993, p. 22, emphasis, including capitalization, in original

In this chapter, the vivid illumination of unOthering is discussed as a provocation of pursuing more equitable technology integration. Figured worlds (Gee, 2011, 2014) and Othering (Kumashiro, 2002) are theories I thought with. The social and cultural constructions of what is "normal" and what is considered "not normal" (i.e. Othered) may reinforce discriminatory and dehumanizing discourses and practices in schools. Throughout this chapter, I use some of the things I learned from what Rachel share with me to interpret how unOthering may be taken up as a catalyst for equity work in elementary technology integration.

"I see four ways to conceptualize and work against oppression: education for the Other, education about the Other, education that is critical of privileging and Othering, and education that changes students and society."

- Dr. Kevin Kumashiro, in *Troubling Education: Queer Activism and Antioppressive Pedagogy*, (2002, p. 31)

As a post-intentional phenomenologist, I interrogated how the phenomenon was produced, provoked and ultimately took shape as a continuous process of construction. In post-intentional phenomenology 2.0, Vagle (2018) encourages researchers to employ Jackson and Mazzei's (2012) *Thinking with Theory* as a "plugging in" process. This

analytic approach of "plugging in to produce something new is a constant, continuous process of making and unmaking…" (Jackson & Mazzei, 2013, p.1), and "should not be viewed in a linear 'methods' fashion, but in an open and shifting cyclical pattern" (Vagle, 2018, p. 139). The iterative cyclical process of Vagle's (2018) methodological components were exercised in addressing the research question, "*Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?*" Identity as social and cultural constructions were used to better understand educators' experiences of the phenomenon. Therefore, the way in which the phenomenon (as represented in the phenomenological material) took shape through identity offered a glimpse into particular ways of being in this world.

To this end, I utilized Gee[22]'s *figured world* theory (2011, 2014) as a thinking device, a generative act, for analyzing the phenomenological material portrayed in this finding. Gee asserts, "a figured world is a picture of a simplified world that captures what is taken to be typical or normal" (Gee, 2011, p. 42). These social and cultural constructions of taken-for-granted-truths regarding what is 'normal' are at work both within our minds and within our ways of being through discourses and practices (Gee, 2011, 2014). An elementary education figured world is shaped by social and cultural constructions of what has been constructed as "normal" in classrooms. The figured world of elementary education, I argue, is constructed through three dominant sets of

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[22] Gee drew upon scholarship in which identity is shaped by particular actors being recognized and valued. Significance is assigned within interpretations of how the world works as part of a larger theory of identity (Holland, Lachicotte, Skinner & Cain, 1998).

assumptions: the commitment to the whole child, stage developmentalism and interdisciplinary instruction. Figured worlds influence the distribution of social goods (Gee, 2014) in terms of what people desire and value, and who gets what. Within this chapter, I refer to the social goods of inclusion, education and social opportunities through technology integration in elementary education.

Figured Worlds as Entangled Social Constructs

Rachel and I engaged in a conversational interview about her experiences pursuing more equitable tech integration. We sat in third-grade sized chairs, at a third-grade sized table, in a side classroom of her learning studio after school had wrapped up for the day. Surrounded by anchor charts, language scaffolds, whiteboards and curriculum the ebb and flow of the discussion offered time and space to talk freely about her professional learning cohort experience - the moments of intrigue and perplexion, the connections and disconnections, the 'ah-ha's', the movement in thinking or practice - as we explored equity work in education around using technology for teaching and learning as an opportunity to pursue social change.

During our discussion, Rachel was invited to share an artifact she felt represented her learning journey (see Appendix J). Rachel turned to her journal, highlighting a few reflective experiences that really stood out for her. In my multiple listenings, viewings and readings of this interview as well as my post-reflexing Voice Memo following the interview, I found myself circling back and being drawn to this embodied moment in which Rachel's description of the 'normalization' exercise occurred. The following

'What is normal?' professional learning cohort exercise (see Figure 6-1) framed aspects

of our social identities work.

Figure 6-1. Professional learning cohort experience: What is normal?

Professional Learning Cohort Experience:
What is normal?
Identity
-isms

This reflective learning experience took place early in the morning during our initial cohort meeting as a framing exercise around the topic of social identity. I facilitated the reflective process using the notes below as a guide while participants processed their thinking and journaled. Writings, drawings, lists, flow maps, mind maps, etc. were all welcomed as modes to communicate.

- Take a moment to write or draw what is "normal". If a person is normal they…
- Now let's think about students. What are the attributes of a "normal" student? If a student is normal they…
- Zoom in one more layer. Write and draw about you - in and out of school. What makes you - you?
- Scan your journaling.
- In the margins, in a different color, name the identity categories you have represented (e.g. gender, race, culture, socio-economic status, sexual orientation, religious beliefs, language, family structure, able-ness).
  - What terms do you use?
  - What do they mean to you?
  - How was this identity formed? What messages did you receive growing up about yourself in relation to this identity category?
  - What makes you think that?
  - How have your experiences shaped your identity? What other things influenced your identity in this category? What messages did you learn about those who are different from you in this social identity category?
  - What work do you believe you still need to do in this social identity category to feel positive about your own identity and/or understand others' identities?
  - How are these identity markers of difference represented in what you view as "normal"?
- Our society is hierarchical - privilege exists in walls, systems and habits.
  - We don't even necessarily need a perpetrator to experience/be affected by privileged ways of being.
  - Similarly – we might act that privilege out (embody it) unconsciously and affect others.
  - It is important for us to become conscious of how society is geared to privilege ways of being in infinite ways, to spark social change, particularly as teachers.
- Look back at the identity markers, markers of difference, and share your thoughts on whether certain identity markers are privileged over others.
- This exercise is intended to help us "see what frames our seeing" (Lather, 1993). We will refer back to what frames how we perceive the world throughout our time together.

Guiding Phenomenology Questions for Cohort Discussion:
1. What is it like for you to think about your social identity?
2. How did you feel when thinking about early memories that relate to your identity formation?
3. Describe the experience of thinking about your social identity in relation to other identities different from yours.
4. What is it like to connect your social identity to your teaching?
5. What might this mean for your learners?

With a tinge of nervous laughter Rachel began to share:

The very first day when you asked us what is normal, and I was kind of thinking, how does this relate to anything? … this year has felt super challenging with behavior and with student needs, and just the size of our classes. And I was listing like things that are normal to me, I think it helped me look at my class through a different lens. I feel like oh, the way that they're acting is really normal. And like when I think about some of the trauma and the different experiences that kids have had, I think it just shifted my thinking from feeling frustrated like, this is such a hard year, to like, well these kids are acting like probably most eight or nine-year olds would coming from the situations that they've come through. And so I feel like it really shifted my lens… so I'm seeing it [their behavior and needs] as normal. So I think that helps remove some of my frustration and like, Why is this like this?… and then, that doesn't fix anything, but it takes away some of that stress I think, if that makes sense. (Rachel's interview, 12-12-2017)

Thinking with the figured world theory (Gee, 2011, 2014), the social identities portrayed in this excerpt captured a simplified understanding of "normality" in a third-grade classroom. Rachel initially identified that it is not normal for a third grader to lay on the floor, talk out of turn, compete for attention, throw a chair, run out of the classroom, or refuse to work (Rachel's interview, 12-12-2017). Initially Rachel's figured world of a third-grade classroom assumed the learner's physiological, safety, love/belonging, self-esteem and self-actualization (Maslow, 1943) needs as a whole child were met and their development was on par prior to entering the learning space. Further, this construction of a figured world assumes social and cultural norms for how students think, communicate and act in elementary school (e.g. sitting still in chairs, raising hand to speak, keeping body to self). Social constructs shifted as Rachel challenged the boundary of her figured world to include experiencing feelings, fears, and insecurities; having good and bad days; being a product of your environment; reflecting your family and how you were raised; and desiring attention. To illustrate the deconstruction and reconstruction of "normality" in Rachel's figured world, she shared:

> Okay so this is normal… so I can let go of the part of this isn't what I pictured… I think I was doing less of comparing my experience [of school and home] to theirs and now I think like, we're the same. (Rachel's interview, 12-12-2017)

Prior to our professional learning cohort, and specifically the "What is normal?" learning experience, Rachel experienced, and may have at times used, "normal" in ways which reinforced discriminatory and dehumanizing discourses and practices in her school community. Rachel attempted to stretch the bounds of the term "normal" to be inclusive of all of her learners (RPRJ, 2-12-18).

For example, Rachel declared, "Well these kids are acting like probably most eight or nine-year olds would coming from the situations that they've come through. And so I feel like it really shifted my lens… So I'm seeing it as normal" (Rachel's interview, 12-12-2017). As an equity-oriented scholar and practitioner I routinely encounter deficit-oriented phrases such as "coming from the situations they've come through" (Rachel's interview, 12-12-17) positions students' experiences as a deficit, as outside of the realm of normal. Often, they are meant with good intentions in acknowledging experiences of the whole child (e.g. trauma, poverty). However, they can also indicate moments of savior notions or deficit discourses being taken up in educational spaces and practices. The demographics of Rachel's school community are 75% students of color and 80% free/reduced lunch (Minnesota Department of Education, 2017). Rachel's identity as a white, straight middle-class female may be influencing her read of her students. In this way, when Rachel initially expressed her frustration with what she and her colleagues perceived as challenging behaviors and needs of students, the students were being compared to her privileged interpretation of appropriate participation in schools.

Following Rachel's participation in the professional learning cohort her perceptions regarding ways of being normal in school shifted.

As a foundation to this dissertation, Gee's (2014) framing of identity as "different ways of being in the world at different times and places for different purposes" (p. 3) is important. Rachel named her prior understanding in comparison to her new conception of what is "normal"[23] in elementary school. Exploring social identity, and how normalization practices are connected to teaching practices, is central to this analysis. What is considered as normal (a way of being) in a classroom (a particular place/context) is one way identity is enacted. Rachel's learners are conducting themselves in ways that often reside outside of acting "appropriately or normally" in Rachel's dominant configuration of an elementary classroom figured world.

The judging of appropriate ways of acting, interacting and identities in school, albeit likely unconscious, combines the presence of knowledge, beliefs, opinions, and intuitive/subjective understandings regarding the idealized 'ways of being' in classroom norms. To this end, the figured world represented here is one of an *evaluative world*, one in which "theories, stories, ways of looking at the world which we use, [is] consciously or unconsciously [used], to judge ourselves and others" (Gee, 2014, p. 109). In this evaluative figured world Rachel expressed what is valued as 'appropriate' - ways of acting and interacting in school (e.g. attitudes, communication, participation, body control). The nuances of the (re)figured world classified ways of being a learner and a

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[23] For this point forward the use of the term normal, when written as "normal" is a move to indicate Rachel's new conception of normal as a figured world in which all of her learners are members (RPRJ, 2-12-18).

teacher supported addressing the research question, "*Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?*" by opening up how an elementary educator's figured world might take shape in the pursuit of more equitable technology integration. I interpret inclusion being distributed as a social good in this vivid illumination. The phenomenon took shape in the entangled social construct of (re)normalizing students in more inclusive ways. Rachel's experience helped me to understand how pursuing more equitable technology integration may be influenced by social and cultural constructions of what is deemed normal in elementary classrooms. The phenomenon was constructed through the reconfiguring of 'normal' students towards more inclusive practices which allow for multiple, non-hierarchical existence and engagement. As normal is diversified, by way of inclusive, multiple and varied conceptions of learners, ways of being through discourses and practices in the pursuit of more equitable technology integration can take shape. Another way the phenomenon took shape was made visible through embodied knowing.

Embodied Knowing

Throughout Rachel's dialogue her body made prominent shifts. She began the above conversation with minimal motions while drinking tea and then proceeded to larger, more expressive motions. Large spiraling hand gestures emerged as she spoke of challenges. Arm gestures and counting fingers coincided with the listing of situations and ways of being "normal". Rachel closed this part of the conversation holding her hands on her chest, after she physically set aside the challenges she and her learners were

experiencing with a pushing motion away from her body. She held her hands on her heart. Her shoulders relaxed. She took a deep breath in a regrouping pause. As Rachel held her hands to her chest, a sense of warmth and care radiated from her. Further, Rachel's voice transitioned from relatively calm in monotone to passionate and expressive with significant fluctuation as she chronicled the professional learning and reflective experience interrogating what is considered to be normal in elementary schools. Rachel's sense-making was distinctly performed through both mind and body.

In my post-reflexion journal, I processed and analyzed how I initially found this embodied response surprising. I began to unpack my interpretations of what her body was potentially telling me with multiple viewings of the interview video (12-12-2017). I kept revisiting the Voice Memo (12-12-2017) from my drive home after her interview. I noted at first, I felt uncomfortable: I did not know what to do with that experience. I knew I had witnessed something powerful. Yet, I was unsure how to go about unpacking it.

Acknowledging that any single way of sense-making is insufficient for understanding our complex world (Miller et al., 2008), my analysis indicated the embodied response, and my interpretation of it, operated through interconnected language, sense perception, emotion, reason, imagination, intuition and memory. The verbal language, reasoning and memories Rachel communicated operated in conjunction with emotions and imagination of what could be. At the same time, my sense perception, intuition, reasoning and memory were utilized for analytic sense-making. Rachel physically and figuratively pushed aside oppressive forces of learners being labeled as

other than the idealized ways of being normal learners in her classroom. The analysis of these phenomenological materials (post-reflexions, professional learning cohort experience, Rachel's embodied response, interview artifacts) composed an entanglement of normalization and care for students and technology integration.

Rachel's sense-making from the professional learning experience focused on identity was different than her peers' sense-making. The intent of the exercise was to identify social identities and connect how they influence teaching beliefs and practices. Then in a later professional learning cohort we would interrogate how social identities may influence technology integration beliefs and practices. However, Rachel's experience of the exercise illuminated how identity reflection made space in her teaching to engage with the phenomenon through perceptions of "normal". Through thinking with the figured worlds theory (Gee, 2011, 2014), I interpreted that the making and unmaking of her conception of what is "normal", and the recognition of practices in her classroom, enabled her to set aside some things that "were not as they should be" in order to (re)consider conceptions of equity within technology integration (RPRJ, 1-7-18, 2-12-18, 2-22-18).

In another post-reflexive Voice Memo (RPRJ, 2-12-18) I focused again on this phenomenologically embodied moment and questioned why Rachel may have taken this experience up in such a different way than her peers. I wondered if Rachel was unwittingly seeking a path to move beyond 'what should be' in the figured world of her classroom (RPRJ, 2-12-18). I noted in my past observation experiences within Rachel's classroom (not related to this study) how she strives to be 'on' and 'responsive' in each

and every interaction with her learners. In my Voice Memo, I used the phrase "love them well" (RPRJ, 2-12-18). My analysis process included flow-mapping the transcript of our conversation with post-reflexion journal and cohort artifacts. Through the analysis flow map, I was able to visualize how this embodied moment of reflecting on what might deemed as "normal" circulated through Rachel's figured world and the pursuit of more equitable technology integration (RPRJ, 2-22-18). Normalization (as made visible through figured worlds), care for students and technology integration were entangled in the pursuit of more equitable technology integration. I concluded that the force behind Rachel's pursuit of more equitable technology integration was, in fact, her efforts to love her students well. Prior to my post-reflexing on the moment this notion of 'loving our students well' in relation to the phenomenon was not an idea I had imagined.

unOthering

For this reason ('loving our students well'), I concurrently thought analytically with Kumashiro's (2002) *Othering* to understand oppressive forces in the lives of learners related to technology integration practices. Kumashiro's reference to the term Other in working against oppression may be understood as:

> … those groups that are traditionally marginalized, denigrated, or violated (i.e. Othered) in society, including students of color, students from under- or unemployed families, students who are female, or male but not stereotypically masculine, and students who are or are perceived to be queer. They are often defined in opposition to groups traditionally favored, normalized, or privileged in society, and as such are defined as *other than* the idealized norm. (2002, p. 32)

Education often serves mainstream society; so, those who are perceived as other than the idealized norm (i.e. Othered) most likely experience harmful practices in schools was an assumption in my analysis made visible through thinking with Othering. I situated

markers of difference (i.e. socioeconomic, race, gender, sexuality, culture, language, class, religion, ableness, etc.) as conceptions of Othering in my analysis. In analyzing the phenomenon through the manifestation of Othering, Rachel helped me lean into influences of elementary figured worlds, the taken-for-granted-truths of what is "normal" in the elementary classroom. Rachel spoke of her experiences in school. She described behaviors such as sitting still on the carpet for stories and waiting for a turn in line as what she believed happened in school with a good teacher (Rachel's interview, 12-12-2017). Rachel shared the disruptive, and at times physically harmful, behaviors of some of her students. She expressed how she and her colleagues would say, "Well it shouldn't be like that" and "I wasn't laying on the floor as a student… just as much as I am a product of my environment, they're a product of their environment" (Rachel's interview, 12-12-2017). Rachel's students are positioned as in opposition to the children who behave normally in school. The 'correct' way to behave (e.g. Rachel's white middle class ways of being) is normalized and privileged by Rachel and many of her colleagues. Othering influenced Rachel's profiling[24] of her classroom. For example, she shared how this year has been challenging with student behaviors, sharing that she wasn't disruptive as a student and "Well it shouldn't be like that" (Rachel's interview, 12-12-2017), she profiled students based upon her figured world of how normal students behave. Rachel and her colleagues Othered students who behaved differently from the students in their privileged figured worlds. In this way discriminatory and dehumanizing practices

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[24] In my analysis and post-reflexing I note that the word profiling brings with it a long and racially-charged history. In account of the equity work focus of this dissertation I have opted to not shy away from the word profiling, especially in the context of exploring educational Othering.

towards those who reside outside of what is deemed normal may have been reinforced. As such, the students' identities were 'Othered' and barriers to 'loving our students well' were constructed.

Drawing upon Othering (Kumashiro, 2002) produced a lens to explore how the process of saying-doing-being establishes one's identity through casting opposition to (and frequently vilification of) a group through markers of difference. Those who are Othered are denied characteristics of being the 'same', 'normal', 'not one of us', and, at times, not worthy of entitlement to human rights. The act of Othering is positioned here as a manifestation of normalization practices in schooling. The learners are different from an imagined 'us' - us being those who 'know' and 'do' school correctly. Othering or unOthering can be conceptualized as practices rooted in figured worlds. This conceptualization facilitated a critical lens to be understand privileging and Othering in classroom practices. As a result of this theorizing I explored the analytic question, *"How might unOthering practices in a classroom figured world produce the pursuit of more equitable technology integration practices?"*

This inquiry was explored through revisiting Rachel's interview (12-12-2017). I interpreted in the process of naming normality, Rachel found respite in letting go of what she could not control.

> I was listing things [in the professional learning cohort activity] that are normal to me, I think it helped me to look at my class through a different lens… because I wrote down feelings, fears, insecurities, having good and bad days, being a product of your environment. It's normal to reflect your family and how you were raised, to want attention, to be insecure about things you can't do. (Rachel's interview, 12-12-2017).

In this moment, rather than comparing students to her figured world, Rachel began to look for similarities and humanize her students. Rachel expressed prior to this professional learning cohort experience she felt stuck and that she could say it is not supposed to be this way for one hundred and eighty school days, or she could let go of seeking to control the ways things are and look for opportunities to empower her students (Rachel's interview, 12-12-2017). Relinquishing tensions around lack of control was crucial in order for Rachel to make space for a shift in her mindset and enter into thinking about equity in technology integration. When asked about this shift she said:

> Yes, [a shift] completely. "So then what can I do from that [viewing my students actions and needs as normal]?" And that goes not only for technology, but just anything, and reading, and "So, what can I do?" "How can I then work?" ... But I think it did help me think about my class, and then the cohort, it was a good launching off place to think about equity in technology, and like what can I do from there… "It was a shift, it felt like a shift." (Rachel's interview, 12-12-2017)

I then asked, "So [by] making that shift then,... how did that inform your experience as we talked about tech[nology use]... as a frame for your action" (Rachel's interview, 12-12-2017). unOthering made space in Rachel's figured world to set aside how she perceived her students 'should be', which allowed her to be present and responsive. This was exemplified when she said:

> I think it just removed a frustration… I don't need to worry about why things are the way they are, it's just a matter of in technology and in reading and in math and in anything, "How can I now empower these kids who are acting normally? How can I help move them forward?" ... It was a good launching off place to think about equity IN technology, and like what can I do from there. (Rachel's interview, 12-12-2017, emphasis added)

Rachel's shifting beliefs opened up space to explore how she experienced the pursuit of more equitable technology integration. The pursuit took shape through Rachel pushing

aside stress and frustration informed by the perceived way things should be in her classroom. By creating some breathing room, Rachel appeared to have (re)positioned the use of technology in the classroom ecosystem to hone in on the work of empowering her learners. This moment of reflecting on what Rachel deemed as "normal", in the new inclusive conception, circulated through her journey pursuing more equitable technology integration.

Although I concede that Othering in the figured worlds of elementary classrooms exists, in this moment Rachel's movement to unOther her learners provoked space to enter into inclusive thinking. This provocation facilitated a shift in the classroom figured world in order to enter into work around equity in technology integration. In short, pushing the bounds of a figured world interrupted and transformed understandings of how the pursuit of more equitable technology integration took shape through thinking with Othering (Kumashiro, 2002). In doing so, the dispersion of social goods (e.g. inclusion, education and social opportunities through technology integration in elementary education) was influenced by the phenomenon.

Making and Unmaking Through Discourse

Another way the pursuit of more equitable technology integration phenomenon took shape was through discourses. Discourse, as a social construct in figured worlds, shapes particular ways of being an educator. The phenomenon was made and unmade through language. Specifically, the language a participant used was entangled in embodied knowing and unOthering practices as elementary educators who work against oppression through equity work in technology integration.

For example, Rachel expressed how building her language capacity around inequities was powerful for herself and her learners (Rachel's interview, 12-12-2017). As a professional learning cohort, we engaged in building common vocabulary and understanding around concepts of equity with technology (e.g. digital divides, digital inclusion, social participation) (Researcher's cohort artifacts, 11-18-17, 12-2-17, 12-6-17; RPRJ, 11-19-17, 12-3-17, 12-16-17). The experiencing of building equity-focused common language shaped how Rachel entered into a conversation around technology use with her students (RPRJ, 12-12-17, 1-7-18). Rachel articulated the power of discourse:

> … it was really helpful to put words to it [oppression and inequities] and for me to identify [terms]. I think I had thought about the [digital] skills… but I didn't have language... so I think that was really empowering for me to have language for it and to talk about it with colleagues, like I have a name for this now and I can explain it better…. I liked when we read articles [about digital divides, digital inclusion, digital literacies, social participation, social class, race] and we drew pictures representing them and then we drew arrows connecting them [the terms and concepts]. One of the things in my articles was talking about [social] class, and it was encouraging you [educators] to... teach kids about the class divide… give kids some of that language… We've started to do that... we try to be really intentional about that… teach[ing] third graders about that [social inequities] and doing the same thing with technology uses gives them [the language], or it's have you noticed not everybody has the same thing and some people have smartphones and some people don't?... reading that article [excerpts about social class] I feel like really pushed me to think about taking that [the language to understand inequities as] the next step, and to giving kids language to something that they all see and feel and know. That this student has a phone, this student doesn't, and... so I think that was another little click in my brain, like oh, I can teach kids about this [social inequities], and I think part of me feels like it needs to be a secret, and I don't think it should be. It's just like I want everyone to feel the same, but everyone's not the same and we don't have all the same access, and so it's okay to talk about it. (Rachel's interview, 12-12-2017)

My interpretation is that Rachel's understanding regarding having the language to name her thoughts and feelings as well as to explicitly name inequities built her capacity to engage in equity focused technology integration work. In her pursuit of more equitable

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technology integration she experienced an empowering moment in which the language-in-use (Gee, 2014)[25] further sparked unOthering practices in her classroom's figured world. Due to Rachel having the language to talk about equity with colleagues and her students, it prompted her to replicate a similar experience with her learners. This experience with her learners helped illuminate a component of how pursuing social change took shape through the facilitation of learner's ability to name and discuss the inequities experienced (Rachel's interview, 12-12-2017, RPRL 1-7-18). My analytic notes cited naming inequities as having perceived implications for participants in removing the power from a given injustice (RPRJ, 1-7-18). For example, Rachel expressed a tension with fostering a community in her classroom and the practice of 'calling it like it is' (Rachel's interview, 12-12-2017):

Tiffany:	Can you tell me a little bit more about that [teaching learners vocabulary about inequities] piece?
Rachel:	Sometimes we want to feel like we're all the same, you know? And there's that community piece… [but]… it's not real.
Tiffany:	So what does that mean for you as a teacher?
Rachel:	It is part of being human. I feel like we're still figuring that out, but I've already been wrestling in my mind with that, and I think sometime when you do name it [inequities], it takes the power away from it too. And like, better to just say oh some of us have phones and some of us don't, and some of us have parents who don't want us to have phones yet, and we all have different rules. I think if you do it well and you… have a strong enough community when we name it, hopefully it can just feel okay then… but the thing is that's already there and they already know it [that we don't have the same things] … So I think the same could be true, true with technology. Some of us have Internet, some of us don't. Some of us have laptops, some of us don't. So I think it could go really well if it's done effectively and after have a little bit of class[room] community, and I do think naming it [privileges and

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[25] The saying (information), doing (action) and being (identity) of language, by which language meaning is constructed and enacted in and through social practices (Gee, 2014).

inequities]... and talk[ing] about it… I think in the long run, that
type of thing [conversation] is empowering for kids. (Rachel's
interview, 12-12-2017)

Rachel's experience of the pursuit of more equitable technology integration took shape in

the repositioning of her push for commonality in her classroom community towards a

more inclusive community which acknowledges and accepts differing lived experiences.

Her reconstructed figured world positions having language to name differences across its

members as empowering and produced a challenging of the status quo in education and in

her classroom. (Re)positioning what is normal made space for her pursuit of education

that could change students and society. Rachel's experience of the phenomenon

continued to take shape as she took up naming inequities as a path to remove the power

from them (RPRJ, 1-7-18, 2-12-18). Rachel expressed feeling connected to a statement I

shared in our final professional learning cohort when we discussed our role as educators

(see Figure 6-2).

Figure 6-2. What is our work?

Our work is not to leave the world's inequities where they are,

but rather teach students to understand

how systems of power and privilege work,

to recognize and critique them,

to question and confront their effects.

(Bomer & Bomer, 2001)

When asked, "How does that [quote] then connect with your overall experience of this

journey, pursuing more equitable tech?" (Rachel's interview, 12-12-2017) Rachel shared

her experience of beginning to name technology use, likening it to 'code-switching', to

foster more equitable technology use in their learning environment.

> Rachel: It's forced me to reflect again… [that] they [students] haven't created [anything]… it's forced me to think about that, and that goes back to equity too, like what are we using it for, and then am I empowering kids? And I think, after I think our second [cohort] I talked with the kids about… my school laptop and I don't, when I'm teaching you, I don't go buy a sweater at Old Navy, like talking about what it's [the technology is used] for. I mean that's so obvious to me, but… like kids think, "Well this is an iPad, so I should go on YouTube"… [I've learned to be] more explicit, but then empowering them… [with] code-switching language, so it's like, "So when I'm at school, [on] this laptop. Now do I like YouTube? Yes, when I'm at home, I do like YouTube"... but I like to go on YouTube and I like to watch Netflix, and I like to do those things at home, but I don't do those things at the computer that I got from Compass Public Schools; that's my computer that I use at school. And when I do take this home, I use it to plan lessons and make slideshows, and those are learning things, but I like the other things… So ... I use[d] that to talk about appropriate use, and during reading time, we're using this [iPad] to become better readers, and so if you're on DreamBox, that's not an appropriate use because that's a math tool… That reflection spurred me to talk with the kids about the purpose for the [technology] tool. So that's maybe the first step… I think they were able to make that connection and even that, I think when I said DreamBox is not appropriate right now, but they know that I tell them to get on DreamBox at math time, so I think that helping distinguish that DreamBox isn't bad, just like YouTube isn't bad, it's just not gonna help you become a better reader, just like YouTube might not depending on [the video] help me become a better reader. So, I think that distinguish[ment] help[ed]. (Rachel's interview, 12-12-2017)

Rachel's utilization of language to explicitly name digital divides and differences in

technology uses developed her capacity to engage in equity-focused technology

integration work. Building the language around student technology use as a space to

code-switch technology use provoked her classroom figured world. By naming

technology uses and their appropriateness for a particular environment (or device),

Rachel's experience pursuing more equitable technology use in their learning

environment set her learners up to 'tech-switch' their technology usage as a foundational

step. Through the act of sharing "normal" things to do with tech (i.e. watch

YouTube/Netflix, shop, play DreamBox) and categorizing them in relatable ways for her

students. Rachel helped students develop a shared understanding with the purposes of the

technology use not as good/bad binaries, but rather as purpose-driven decisions.

Specifically, the use of language to 'tech-switch' technology uses based upon

context and purpose, made space for unOthering practices in Rachel's classroom figured

world. In this way technology tools became normalized and their uses were framed in

Rachel's (re)figured classroom. Language around technology uses for learning further

developed capacity beyond identification of digital divides to applications of the

conception. Specifically, Rachel and her students distinguished and normalized

appropriate technology use. The ways in which Rachel took up this professional learning

experience influenced how she understood technology integration as a social issue and

experienced the phenomenon. Rachel positioned building language around inequities as

powerful learning opportunities for herself and her learners. As a result, the phenomenon

can be understood as entangled relations among people, social systems and the use of

technologies with potential to interrogate and disrupt social inequities. Rachel's

experience helped illuminate a component of how pursuing social change can take shape

in the facilitation of learners' ability to leverage technology for a variety of purposes

(RPRJ, 2-12-18, 3-23-18). As learners' capacity to understand multi-faceted uses of

technology in society develops, so too does their capacity to leverage relationships among people, technology use and social systems.

When analyzing how the phenomenon was being made and unmade through language, I found myself resorting to post-reflexing thinking that felt safe around this topic (RPRJ, 2-6-18, 2-10-18, 2-20-18). At this point, my thinking was no longer explored through the intensities; instead, it became a mind-map of assumptions around technology usage (RPRJ, 2-10-18, 2-20-18). To productively disrupt this train of thought in this process I analyzed my assumptions through these questions:

- *Where are my pre-understandings shaping the phenomenon and phenomenological materials?*
- *Where are the startings and stoppings in my thinking?*
- *How does this ongoing shaping of the phenomenon produce social change?*
  (RPRJ, 2-22-18)

Across multiple charts and countless post-it notes hanging around my dining room these questions guided me to understand how the entangled messiness of the phenomenon took shape in Rachel's particular technology integration practices. Predominantly, Rachel encountered tensions with technology use in her classroom between aims (students creating) and current practice (students using remedial targeted apps during small group instruction time). This tension between beliefs and practice in Rachel's pursuit of more equitable technology integration was witnessed as she questioned what has been normal technology usage for her students in their schooling (Rachel's interview, 12-12-2017). Rachel and her learners began to filter their technology usage through the lens of a

prompt: *"Does this technology tool helps make me a better _____*

(reader/mathematician/scientist/engineer/artist)?" This prompt captured the making and

unmaking of the phenomenon through technology usage lens in education for and about

the Other (Kumashiro, 2002) in two ways. First, using the lens of critiquing technology

tool uses to develop one's *academic* identity could be viewed as education for the Other.

This critical lens draws upon the leveraging of technology to enhance the education

within the school system. Second, using the lens of critiquing technology tool uses to

develop one's *social* identity could be viewed as education of the Other. In this way

technology use is leveraged to highlight the visibility and development of diverse social

identities.

For example, Rachel helped to illuminate how the pursuit of more equitable

technology integration can take shape through striving to normalize (with inclusive and

authentic representation) her students' social identities with more equitable representation

in STEAM[26] at Sunnyside Elementary. Education of the Other could occur through

leveraging technology to increase the visibility of the Other in fields that society writ

large privileges (such as engineers and technology startups). Rachel crafted the prompt,

"Does this technology tool helps make me a better _____

(reader/mathematician/scientist/engineer/artist)?" as a learning-focused frame for

technology use in her classroom (Rachel's interview, 12-12-2017). Drawing connections

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[26] STEAM refers to an approach in education which focuses on inquiry and critical thinking in Science, Technology, Engineering, Arts and Mathematics. Sunnyside Elementary is an established STEAM school. T.O.D. Elementary has transitioned from an International Baccalaureate focused school to a STEAM focused elementary school.

to the professional learning cohort experience Rachel shared her equity-focused thinking

around an article she began to read (a self-selected piece during a cohort meeting):

> Rachel: I started reading [an article]... about STEAM and diversifying STEAM more, and I really like that idea… about kids seeing themselves in STEAM, but I felt like it went a little bit deeper than that, so not just like here's a black scientist, you know?... we did a 'Black Authors Matter' thing last February, and we had talked about kind of doing the same thing… [with] different scientist[s] and… artists, and featuring different people of all cultures… reading is easy to think about, making sure stories are diverse and that there's doors and windows and [mirrors] like that, but I guess I hadn't really been thinking about STEAM in that same way. And so, I think that question would be a little bit like how can I make sure that STEAM is applicable?... [I] think it's something to be mindful of, how can I incorporate justice and technology into something? How can I tie those things together?
>
> Tiffany: I wonder if, if you pull from your critical literacy passion, if you enter in some of your STEAM concepts and have the kids question, well "Who's positioned here?", "Who is privileged here?", "Who has the power?"
>
> Rachel: "Who don't we see", or-
>
> Tiffany: "Whose voice isn't here?"… [weave] the power and the positioning and privilege [inquiries] through that.
>
> Rachel: Because you could apply those same type [of questions and inquiries]…
>
> Tiffany: That, in my mind, could be one way to start entering in the conversations, and then think, and then we can think about well, what [technology] tools can they use to explore that further?
>
> Rachel: Totally. And to share other voices… I think [technology use in] STEAM could be a really cool place to pursue… So that's really exciting, I like thinking about how I could do that equity work. (Rachel's interview, 12-12-2017)

In this interaction, we collaboratively processed how the pursuit of more equitable

technology integration was taking shape in Rachel's classroom. Together we fused

Rachel's passion around critical literacy[27] practices with her intrigue in increasing diverse

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[27] Critical literacy is not explicitly at work here. Within the interview Rachel referred to her Master's Degree learning around critical literacy and how there was a familiar thread of looking closely at privilege

representation in her STEAM instruction through the use of technology. In the process of

striving to inclusively normalize social identities with more equitable representation, the

conception of Othering was featured. Rachel discussed her aim in ensuring those who

are Othered are exposed to windows, mirrors and sliding glass doors in science and

technology fields (Rachel's interview, 12-12-2017). Her phrasing revealed inherent

Othering in the process of attempting to unOther. Specifically, within Rachel's

experience of the phenomenon through striving for inclusive classroom resources, she

brought forth the Othering gaze of who is positioned where in relation to the windows,

mirrors and sliding glass doors. The trouble in the naming of unOthering reifies Othering

to a degree with a constant comparison to what is perceived as normal in the given

figured world; who constructs the windows, mirrors and sliding glass doors, and how

does this conceptualization for diverse educational materials refiy a colorblind binary. In

equity-oriented work it is important to inquire what it means when we enact such

practices and the ways it impacts those who experience marginalization. Future research

should explore these noticings; I drew upon Dr. Rudine Sims Bishop and Dr. Zetta

Elliot's scholarship as I sought to analyze this moment, which focused on literacy-

oriented concepts and moved me away from the technology integration phenomenon.

For the analytic purposes of this dissertation, this moment represents one way in which

the pursuit of more equitable and inclusive teaching and learning can take shape. All of

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and power in texts with using technology to facilitate critical inquiries and more inclusive STEAM learning
materials/experiences.

which was launched in response to dialogue circulating through Rachel and her learners' new technology usage frames for learning.

Another example of a change in technology integration through unOthering practices in her classroom figured world occurred in Rachel's literacy instruction. As she re-conceptualized what is normal to be more inclusive (unOthering), she noticed discrepancies in how technology tools were integrated across her leveled literacy groups (RPFJ, 2-22-18). The "high group" engaged in book talks and comprehension discussions via Google Classroom whereas the "low groups" either did not have the opportunity to use technology during literacy time or they used low-level rote memorization games (Rachel's Cohort Artifact, 12-6-17). Deficit discourses manifested through these Othering practices in which the saying, doing and being of language-in-use were constructed and enacted in and through the social practice of literacy instruction. These literacy practices took shape as inequitable technology integration practices. Through our professional learning cohort experiences, inequitable technology integration practices such as this one became visible and were disrupted. In her interview Rachel indicated her plan to change her instructional practice to include collaborative virtual discussions across all literacy groups as one way she is working towards inclusive education and social opportunities (12-12-17).

One way this finding might be misunderstood is if agency is interpreted as residing solely within Rachel. On the contrary, while Rachel did enact agency and autonomy in her teaching, it is how she experienced the pursuit of more equitable technology integration that fostered agency to enact social change. In this conception,

the ways in which one experiences the productions and provocations of the phenomenon influences technology use in education which changes educators, learners and social systems.

Summary of unOthering Chapter

Thinking with theory fostered the exploration of *"How might unOthering practices in a classroom figured world produce the pursuit of more equitable technology integration practices?"* as an analytic tool in addressing the research question, *"Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?"* Specifically, thinking with figured worlds (Gee, 2011) and unOthering as an analytic approaches for the pursuit of more equitable technology integration aided in capturing these constructions:

- identity through classroom normalization practices;

- influence of figured worlds on teaching practices and the social goods of inclusion, education and social opportunities through technology integration;

- manifestation of Othering in schooling;

- emergence and exploration of an analytic question; and

- provocation of the phenomenon through unOthering practices and the recrafting of a classroom figured world.

These constructions aided in the understanding of how the recrafting of what is "normal" and unOthering practices were critical for how Rachel spoke to, and intervened in, technology integration as a social issue. unOthering as a practice may be a launching

place for equity IN technology (Rachel's interview, 12-12-2017). In doing so, one may disrupt how the classroom figured world "can marginalize people and things that are not taken as 'normal' or 'typical'" (Gee, 2011, p. 41) with aim to redistribute the social goods (Gee, 2014) of inclusion, education and social opportunities through more equitable technology integration. Therefore, unOthering practices may produce a shift in teaching beliefs and practices towards more equitable technology usage to enact social change. Ultimately, unOthering in Rachel's classroom figured world provoked space for technology integration equity work to actively constructed a more just future. Likewise, the vivid illumination of questioning societal implications, discussed in Chapter 7, may position elementary educators to actively construct more equitable technology integration futures.

Chapter 7: Questioning Societal Implications - A Vivid Illumination of the

Phenomenon

If one conceives the ability to utilize technology as an opportunity for an inclusive

social process, then exploring technology integration through a social theory of discourse

(Fairclough, 1992) may be fertile grounds to probe the process of making and unmaking

social change in education. In this chapter, social practice (Fairclough, 1992) is *thought*

with as a tool to explore discourse as a mode of action. In particular, the vivid

illumination of questioning societal implications explores social practice as a process in

which movement between the social structure of discourse and the social practice of

technology integration in elementary education. Being the 'technology police', a fear of

impact and checking assumptions are three intensities in how the social practice of

discourses informed some of the ways in which underlying technology integration beliefs

and practices were at work in the pursuit of more equitable technology integration.

Throughout this chapter, I use some of Kai's, Olivia's and Wade's phenomenological

material to interpret how questioning societal implications may shape equity-oriented

technology integration work in elementary classrooms.

In particular, I thought with Fairclough's social theory of discourse when

analyzing specific phenomenological episodes in order to address the secondary research

questions, *"What are some of the underlying technology integration beliefs and practices*

at work, if any?" and *"In what ways, if any, do the lived experiences of in-service*

educators evolve throughout involvement in professional learning experiences?" My

analytic approach sought to (a) decenter binaries, (b) facilitate emergence of analytic

questions, and (3) position myself and my readers in the threshold of meaning-making (Jackson & Mazzei, 2012).

The provocation of *questioning societal implications* analysis is organized in the following ways. First, I outlined how Fairclough situates discourse as a social structure. In doing so, I draw connections to assumptions and delimitations of ideology at work in the phenomenon as a social practice. Second, I framed my thinking with regard to Fairclough's (1992) social practice theory in relation to social structures and struggles as represented in the phenomenological materials. Third, I used Fairclough's social practice (1992) to theorize the analytic questions that emerged around educators' technology integration beliefs and practices as a means of leveraging technology in classrooms towards more equitable social change.

Discourse as a Social Structure

Discourse is positioned as a mode of action - to act upon the world, to act upon each other, and to represent social meaning (Fairclough, 1992). Hence, discourse is in a relationship with social structures as they constitute and are constituted by each other. Specifically, discourse is socially constructed in a "relationship between social practice and social structure… not just of representing the world, but of signifying the world, constituting and constructing the world in meaning" (Fairclough, 1992, p. 64). That is to say that discourse is a mode of action on both individual and societal levels contributing to systems of knowledge and beliefs which politically and ideologically composes, naturalizes, and sustains power relations (Fairclough, 1992). What is most relevant to this dissertation is the conception of social practice as a process. Movement occurs

between the social structure and the social practice (Chouliaraki & Fairclough, 1999) in a social activity such as teaching (Fairclough, 2001). Social practices are shaped in ways members of the social structure often are unaware. Unconscious social practices are borne through systems of knowledge and beliefs, social relations and social identities - what Fairclough (1992) identifies as three foci to examine. In this way, discourse shapes teaching practice through established, and frequently reified, societal ideology which influences cognition and motivates action/inaction. As a result, social ideologies shape how people make sense of their world while positioning and legitimizing.

Technology Integration as a Social Practice: Structures and Struggles

Utilizing intersectionality (with a lowercase i) as a conceptual concept to better understand and experience the intertwined nature of people, social systems and the use of digital tools within schools facilitated an exploration of the pursuit of more equitable technology integration through discourse as a mode of action. Three intensities emerged in the phenomenological materials as structures and struggles: being the technology police, fear of impact and checking assumptions.

Being the technology police. Discourse surrounding technology use with youth has contributed to beliefs which ideologically compose, naturalize, and sustain how people represent, engage with and act upon the world. Educators and parents have been cautioned about the relationship between technology use and children's health and well-being (e.g. obesity, sleep patterns, behavioral issues, brain development), children's academic growth (e.g. focus and attention problems, decreased academic performance), and children's interpersonal skills (e.g. socialization with peers and adults, language

development) (American Academy of Pediatrics, 2011a, 2011b; Appel & O'Gara, 2001;

Brooks-Gunn & Donahue, 2008; Campaign for a Commercial-Free Childhood, 2010;

Christakis, Garrison, DiGluseppe, & McCarty, 2004; Common Sense Media, 2008, 2011;

Cordes & Miller, 2000; Lee, Bartolic, & Vandewater, 2009; Vandewater & Lee, 2009;

White House Task Force on Childhood Obesity, 2010). As represented in Kai's

experience of the phenomenon, these discourses informed one of the ways in which her

underlying technology integration beliefs and practices were at work in the pursuit of

more equitable technology integration.

Kai:	One of the biggest things that jumped out to me was just the past few weeks, I feel like I haven't been limiting my students with technology.
Tiffany:	Okay. Tell me more.
Kai:	I always feel like I have to be the "technology police". You see kids out at Target or driving in a car, and they have a device in their hands, and I always hear all of my friends say, "I have to limit screen time," so I feel like I had to be that person for them. I'm like, "I'm going to be a positive role model with technology, and I'm going to really limit how much screen time they get in the classroom"... I think that's a fear of mine… so I regulate it.
Tiffany:	At one of our cohort meetings… you talked about that tension of, "Where do I let them just be free, and where do I have that ethical responsibility of need[ing] to monitor [their technology use]?" (Kai's interview, 12-27-17)

Kai opened our chat over coffee one afternoon with this reflection on what she terms her

technology police role. The relationship between people and their use of digital tools

within schools can be explored through Kai's voicing of this perceived role that informed

her technology integration practices. I wondered what might have caused Kai's

perceived role as an educator to include the policing[28] of learning experiences with

technology. Thinking analytically with the social theory of discourse (Fairclough, 1992),

prompted me to question, *"What social and ethical discourses around technology usage*

with young learners may have influenced this technology police mindset and role to be

lived out?" (RPRJ, 1-16-18, 3-2-18). It might be said that being the technology police is

chiefly about protecting students from the negative impacts of technology for their health,

well-being and academic growth. While protecting learners is one way to love them well

and uphold our ethical responsibilities, the problem with this understanding is it neglects

to consider the positive affordances of technology such as fostering communication and

collaboration, engaging globally in high-interest and culturally relevant learning

experiences, increasing accessibility of curriculum, facilitating computational thinking

skills, nurturing creativity - all of which support students' development in producing

embodied knowledge.

    Further, this intensity provokes important questions for the field of learning

technologies and elementary education: How are social, ethical, legal and human issues

with ICT use identified? Whose perspectives are considered in the crafting and

reification of these discourses? How are these issues positioned within educators' roles

to address? (RPRJ, 12-27-17, 1-16-18). Posing such inquiries offers a tool to employ

discourse as a mode of action between the social structure of elementary education and

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[28] The term policing is used here in regard to power in the surveillance and control in determining and enforcing technology use in schools. In this form of policing, one's beliefs are enacted and naturalized through discourses and practices. Coded of ways of being an educator are both at work and taken up under the guise of protection.

the social practice of technology integration. For instance, in a professional learning cohort experience Kai identified her current classroom technology use as teacher controlled with limited choice. She believed that technology is used to 'occupy kids' as a high-interest toy/for entertainment and technology use does not help learners develop socially or academically (Kai's Cohort Artifact, 12-2-17).

Kai also expressed ethical issues regarding screen time, following recommendations from the American Academy of Pediatrics (AAP) of limited to no exposure to screen time for children (AAP, 2011). Policies from AAP, including those focused on the use of technologies, influence and filtrate into education through professional organizations such as the National Association for the Education of Young Children (NAEYC). The NAEYC strives to promote high-quality early learning by connecting early childhood practice, policy, and research (NAEYC, 2018). The NAEYC[29] notes technology's appeal may lead to inappropriate uses and encourages caregivers/educators to prohibit/discourage the passive use of technologies and media (NAEYC & Fred Rogers Center, 2012). Discourses become a mode of action when educators' ethical and practical commitments are shaped by discourses emerging from organizations such as the AAP and NAEYC, just as they did for Kai (Kai's interview, 12-27-17).

These discourses shaped my interpretation of how students' social interactions and educators' policy-driven ethical commitments were underlying technology

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[29] Recognizing and explicitly acknowledging the middle-class assumptions that run through broad policy initiatives like NAEYC is one way educators may shape-shift their application of such initiatives to teach all learners in relevant and inclusive ways.

integration beliefs and practices at work in, and in tension with, the pursuit of more

equitable technology integration. I wondered, *"How are social, ethical and human issues*

with the use of ICT identified by elementary educators?" and *"How are elementary*

educators positioned to address these issues within their roles?" (RPRJ, 3-2-18). When

considering these questions, I noticed Kai's reflections (RPRJ, 3-2-18) the following

across cohort artifacts:

> After re-thinking equity/accessibility I realized my assumption is that **ALL** kids
> get too much screen time. I felt like I was being a good example by limiting
> them… In the future I want to be a technology advocate and model proper use
> and allow creativity… I don't want [to] wait on a tech expert (district's
> technology integration specialist) ... I need to me more progressive, research and
> do more… because technology is intertwined with education, politics,
> economics, [and] culture. (11-18-17 through 12-27-17, emphasis in original)

Kai entered the professional learning cohort with discourses from AAP and NAEYC[30]

acting upon her in her role as an educator. In turn she took up discourses, specifically

those around screen time and being the technology police, to act upon her learners. In

practices shaped by the perceived technology police role, Kai represented social meaning

through practices she felt positioned her as being a 'good educator'. The intensities

surrounding the policing of technologies in Kai's classroom suggest that well established

discourses may provoke tensions with technology integration beliefs and practices. In

particular, tensions emerge when positioning technology policing discourses as a social

structure alongside technology integration as an equity-focused social practice. For

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[30] AAP has since revised their positions on technology use with young learners. In 2016, AAP modified its
stance of technology use from a hard line of limiting to a 'be strategic in types of use' approach. Kai was
unaware of this shift, indicating colleagues and peers have not begun to shift their thinking (Kai's follow-
up, 4-17-18).

example, in Kai's pursuit of more equitable technology integration, tensions manifested between her discourse-informed practice and her commitment to equity. Kai's understanding of social interactions shifted from face-to-face peer interactions to broader conceptions of participation in society (Kai's interview, 12-27-17). Kai's conception of ethical teaching practice transformed from protecting learners by limiting technology use to "free-flowing technology-enabled learning" (Kai's Cohort Artifact, 12-2-17). Kai's discourse around human issues with technology were revealed when she noted:

> [The] take away from my study is… [the digital] divide has evolved… the divide has taken a new form [as a] deeper issue = inequity in society. Looking at the digital divides provided me with a new lens to look at technology use in my classroom… I need to consider the use of technology as a vital human right, not a privilege. (Kai's Cohort Artifact, 12-2-17).

I interpreted Kai's representation here as the evolution of not only her beliefs about technology integration, but also of how she experienced societal rights and. privileges manifesting in the (re)constructing of social, ethical and human issues. Here the conception of social practice as a process is exemplified. Movement occurred between the social structure of discourse and the social practice of technology integration in elementary teaching as a social activity. Kai's shape-shifting beliefs around 'being the technology police' and the social practice of discourses informed some of the ways in which underlying technology integration beliefs and practices were present in the pursuit of more equitable technology integration. In the process of exploring the phenomenon as a social practice the following binaries became visible:

- ideologies of using technology as being bad/good for young learners;

- ideologies of technology being a high-interest toy for entertainment/learning and communication tool;

- ideologies of regulating technology use as a role that is positive and productive/harmful and controlling; and

- ideologies of technology use for social participation as a human right/privilege.

Kai's lived experience of identifying tensions between her discourse and her practice illuminated misalignment between her commitment to equity and integration of technology. This illumination decentered binaries in the pursuit of more equitable technology integration. Accordingly, 'being the technology police' as a social practice took shape in a divergent way when the discourse of questioning societal implications emerged.

Fear of impact. Another way discourse of questioning societal impact of integrating technology into elementary education took shape was in a fear of impact intensity. My analysis leaned into intensities surrounding moments of uncertainty in the phenomenological materials. For example, Olivia expressed fear about encountering surprises with technology in the classroom (e.g. inappropriate content, unreliable websites) and not understanding how digital literacies play a role in future life barriers (Olivia's interview, 12-30-17). Feeling uncertain of what might happen induced fear in Olivia around the impact of using technology in her classroom. In these moments of uncertainty, the challenging of her beliefs and practices manifested through her questioning the societal implications of her teaching practices (RPRJ, 1-3-18, 1-11-18).

To illustrate, in Olivia's interview the fear of causing students harm and her learners

being ill-prepared for life became visible as we spoke:

> Tiffany:　　You mentioned you have an aha, a moment of intrigue, or
> something that caused you to pause and think, from our time
> together.
>
> Olivia:　　I think just how important it is to pursue technology in the
> classroom. We use it, but not very much. And then to try to figure
> out, how is that [not using technology very much] hurting or not
> preparing my students for the future if I'm not pushing myself to
> do more with it, I think that was a big [step]... It's hard. (Olivia's
> interview, 12-30-17)

What appears to be motivating this fear is the realization of the broader impacts of her

social practice in her role as an educator. I asked Olivia during her interview, "What is it

that we did together [in the professional learning cohort] that either raised or exemplified

that [pursuing equitable technology use in the classroom] importance to you?" (Olivia's

interview, 12-30-17). When she responded, I perceived a distinct shift of intensity in

Olivia's volume and tone. Her response began to explicitly signal her realization of the

broader impacts of technology integration in her role as an educator as she questioned

one of the societal implications of her teaching practices:

> I think it was a lot of the articles we read and looking at the statistics of what it
> can lead to in the future for them [students], even just as far as filling out a job
> application online and having the digital literacies to do that. Am I giving them
> what they need to provide for their families in the future? (Olivia's interview, 12-
> 30-17)

This moment of the interview was distinctly different than the rest of our conversation

with regard to Olivia's body. Throughout our time together, Olivia's body was relaxed.

She sat with one knee to her chest, occasionally sipping coffee and petting her dog, while

using small hand gestures over the span of a few inches (RPRJ, 1-3-18). Yet, as she

spoke of the uncertainties of what the future holds when considering societal impacts of technology use in schools, shifts in her body were evident. Olivia placed both feet on the ground, squared her shoulders and used precise large arm motions from her head to the table, which generated a sound on impact as she processed how not forcing herself to integrate technology in her classroom might be hurting or not preparing her students for the future (RPRJ, 1-11-18). My interpretation through discourse and embodied ways of knowing is that her uncertainty of what might happen induced fear around the impact of using technology in her classroom. In that moment of uncertainty, the challenging of beliefs and practices manifested through questioning societal implications of her teaching practices (RPRJ, 1-3-18, 1-11-18).

Specifically, Olivia's uncertainty of what may happen if/when she does not challenge herself to leverage technology in teaching and learning is similar to Kai's experience of the phenomenon taking shape through the questioning of societal implications of her teaching practices. Although the relationship among people, social systems, and the use of digital tools in schools manifested differently in these examples[31], Kai's social practice around pursuing technology integration was illuminated when she spoke of how her approach with technology may be replicated in her learners' technology practices. Specifically, thinking with discourse as a mode of action (Fairclough, 1992), one may consider the following to be an example of discourse to act upon the world. As

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[31] In Olivia's experience of the phenomenon the relationship among people, social systems, and the use of digital tools in schools took shape in response to the perception of digital literacies impacting the ability to provide for one's family. In Kai's experience of the phenomenon the relationship among people, social systems, and the use of digital tools in schools took shape in response to the decentering of 'being the technology police' as a social practice to protect her students from the negative impacts of technology.

an illustration, Kai shared her beliefs regarding how the power of her relationship with

technology shapes her learners' relationships with technology:

Kai: I think just being that comfortable with it [using technology in the classroom]. It's kind of like the parent who is timid, the kid's going to possibly be timid too. If the teacher's timid with the technology, like I am, then I feel like I'm limiting them too. I'm comfortable with the iPads that are in our classroom all the time, but I need to push more on what else we can do [with the technology] … Thinking of the ideal classroom and where I want to go, I don't know. I think just taking the baby steps that I have by using "yes" more… [and not policing their technology use] is a big step… I need to be the advocate that I want to be. (Kai's interview, 12-27-17)

Kai perceived her timid relationship with technology as potentially "rubbing off" (Kai's

interview, 12-27-17) on her learners. This belief, when combined with discourses around

screen time, manifested in Kai 'policing' technology usage through uncertainty as a

social practice. In the pursuit of more equitable technology integration Kai is taking

action to change this social practice by saying yes and incorporating more opportunities

for her learners to utilize technology in their learning experiences:

Kai: I feel like I don't know what the shift was... but I just felt better not saying no [to technology use] so much.
Tiffany: Okay. Then what happened?
Kai: … I know I was going off of my assumptions that they all get too much screen time, and I felt like I was being a good example by limiting [use of technology], but then in the end, I didn't feel like a good role model [as a technology user] or an example... and now I don't think screen time is necessarily harmful… I just kind of realized that I don't know what they're actually getting, but then another big part of it is that's [technology] where their interests are. It's kind of like when we would get together [in the professional learning cohort] with you, and you would say, "Write, draw..." You'd just say, "Whatever mode you want to express yourself in, do it that way." So why not allow them [my students] to express themselves… on an iPad instead of with a paper book? (Kai's interview, 12-27-17)

Systemic discourses operating on Kai's individual teaching beliefs and practices were explored. Kai's regulation of technology usage through a timid mindset was bolstered by assumptions around screen time. These assumptions for classroom level technology integration were informed by discourses at a societal level. Kai's shifting beliefs impacted her technology integration practices towards more open-ended learner-focused experiences. As a result, Kai's individual teaching beliefs and practices aided in the exploration of another way societal level discourses operate on technology integration. By interrogating assumptions and tracing implications she re-conceptualized technology integration beliefs and practices. Thus, Kai and Olivia's personal accounts and reflective stances aid in the understanding of how discourses functioned on individual and societal levels (e.g. policies, media) through clarifying and describing assumptions about technology use, tracing implications of technology use to social practices and re-conceptualizing teaching practices. My interpretation is that leaning into the underlying discourses around technology usage in elementary classrooms facilitated the decentering of educators' binaries (such as causing harm/preparing for life, comfort/discomfort with technologies, timid/aggressive technology use and avoidance/advocacy technology integration practices). Naming how these technology integration binaries might be at work on individual and systemic levels made visible aspects of questioning societal implications as a phenomenological intensity in understanding how the pursuit of more equitable technology integration takes shape.

Checking assumptions. Given discourses functioned on individual and societal levels, the structures and struggles of discourse-informed assumptions are further

explored. What is often unvoiced, Wade explicitly named. He shared how he understood

that his assumptions were at work when talking about equity in combination with

technology in his teaching. His assumptions became evident when I asked, "What was

that [equity and technology learning] experience like for you?":

Wade:	I think it just made me be more mindful about what assumptions I had, what students knew how to do. If I had took the time to think about it, I would realize someone might not have a computer at home, but I figured most people have smartphones or a tablet or something.
Tiffany:	What makes you think that?
Wade:	I've heard the students tell me they go to the library all the time and access technology there, and they have technology in our school, which they have access to. But again, if I had thought about it and well, if you're new to the school, you might not have had technology at your old school, or I've had students that are new to the country, which they might not have had access in their home country or refugee camps. If I thought about it, I would actually see, you know what, not everyone had the same access to any technology… I thought that the initial divide had been taken care of.
Tiffany:	Why might that be important?
Wade:	If I actually thought about it even deeper, not every teacher may have utilized technology, so then that whole process of thinking about if I want to be equitable, I have to start from the beginning... but I have to make sure that… [students know how to] log in to the computer… [and] take care of a computer… actually thinking about how equitable my expectations were…
Tiffany:	When you had the time and space to think about your Assumptions… what happened? … Was there anything you encountered about your beliefs about teaching or social issues in our communities?
Wade:	My whole main thing is here's where I have some control, and if I want it to be equitable, then I need to be more thoughtful about what assumptions I have before I start using the technology with the students… I think through the process of having the [cohort] meetings I'm more conscious now about the assumptions I have with technology… and how to be equitable for them [my students]. (Wade's interview, 1-8-18)

There were aspects of the professional learning that were cohort we discombobulating for Wade as he interrogated the assumptions of his beliefs and practice. Intensities emerged in moments of his professional learning when the impact of his social practice was questioned in cohort experiences and individual reflections (Wade's interview, 1-8-18). Throughout the second and third cohort discussions, Wade was intentional in checking his assumptions about technology integration. Prior to our cohort experiences Wade assumed the digital divide had been addressed and was no longer an issue in the U.S. (Wade's interview, 1-8-18). As Wade explored his assumptions, *wobbling* (Fecho, Graham, & Hudson-Ross, 2005) in his thinking generated space for him to explore and understand some of the greater social implications of these assumptions regarding equity within technology integration in his elementary classroom (RPRJ, 1-13-18). Through utilizing the social theory of discourse (Fairclough, 1992) as an analytic tool, I interpreted that in making these comments, Wade might be suggesting that the opportunity to think about and voice his assumptions unfolded into a commitment of building his students' background knowledge with technology (RPRJ, 1-11-18).

Following my analytic readings for intensities in Wade's interview transcript, I wondered if his exertion of control in starting at "the beginning" with his students' technology skills could also be understood as a way of 'policing' technology use? (RPRJ, 1-12-18). While the explicit scaffolding may be beneficial to some, is it possible that the micromanaging of technology usage could also be another mode of exerting and/or exhibiting power? (RPRJ, 1-12-18). My initial reading of Wade's interview transcript operated in binary constructions as either good teaching practices addressing assumptions

and scaffolding instruction or as a negative example of exerting power and control over the technology use (RPRJ, 1-13-18). By employing discourse as a social structure, I now understand this segment as a 'yes, and…'. For example, while it may be controversial to go 'back to the basics', it may also be conceptualized as a practice to level the playing field. The 'yes, and…' interpretation works to decenter the use of discourse as a singular mode of action. Yet, at the same time, the 'yes, and…' interpretation may be conceptualized as a way for educators to act upon the world through practices that are normed across a diverse classroom community resulting in the representation of social meaning in the privileging of developing digital literacies in elementary education (RPRJ, 1-19-18).

Within my exploration of this phenomenon teaching beliefs and practices have been identified with the potential to confine educators to a single way of being, even when their ideological commitments are centered on creating a more just world. Through discourse, Wade, Olivia and Kai represented moments in their pursuit of being equity minded educators for social change in which their assumptions may have shaped the making and unmaking of their beliefs and practices in integrating technology into their elementary classrooms. Next, I discuss how the making and unmaking of their beliefs and practices integrating technology are related to social change in elementary education.

Making and Unmaking of Social Change in Elementary Education

As represented above, my participants helped me understand how pursuing the intersection of equitable practice and technology integration was unfolding and taking shape in moments as a continuous process of construction. Yet, in the open and shifting

iterative process of analysis (Vagle, 2018), I also captured my own technology

integration tensions being made and unmade in the pursuit of social change (RPRJ, 3-9-

18, 3-12-18, 3-15-18, 3-23-18). I detected a significant shift in my interpretations the

more I grappled with Fairclough's (1992) social practice - the third level of discourse.

Even with a resistance to categorize in the post-intentional phenomenological analysis

process, I found myself first naming ideological assumptions that were potentially at

work on societal level and then sorting and labeling these assumptions (RPRJ, 3-15-18,

3-23-18). After repeated pressing into these categorized assumptions, represented in

Figures 6-4 and 6-5, a personal tension became visible (RPRJ, 3-12-18, 3-15-18, 3-23-

18): *If I assume (and position/privilege) technology integration (in meaningful, non-rote*

ways) for social change, am I then unwittingly reifying a classed deficit discourse and

perpetuating the notion (and practice of) social mobility in schools? It felt like I just

swallowed a boulder. My stomach sank. Given that, epistemologically and

pedagogically I hold multiple ways of knowing and being in high regard, the analytic

question of, *if I privilege a 'modern world' and 'social participation in a global society'*

am I then positioning hierarchically-particular ways of knowing and being? also surfaced

in my analysis (RPRJ, 3-12-18, 3-15-18, 3-26-18).

Figure 7-1. Emerging technology integration tensions, Part I.

> Fairclough suggests three foci to examine social practice: Social identities, system of knowledge and beliefs, and social relations (1992).
> - Social identities assumption: Middle/upper class social systems operate and sustain their ways of being through use of technology (social class being considered as a component of social order).
> - System of knowledge and beliefs assumption: People desire to move 'up' in social class (manifesting as a result of norming discourse around social mobility).
> - Social relations assumption: It is the role of educators (of working class, working poor, and lower-class students) to build capacity for upward mobility (commodifying the preparation for and practice of social mobility).

Figure 7-1. Emerging technology integration tensions, Part II
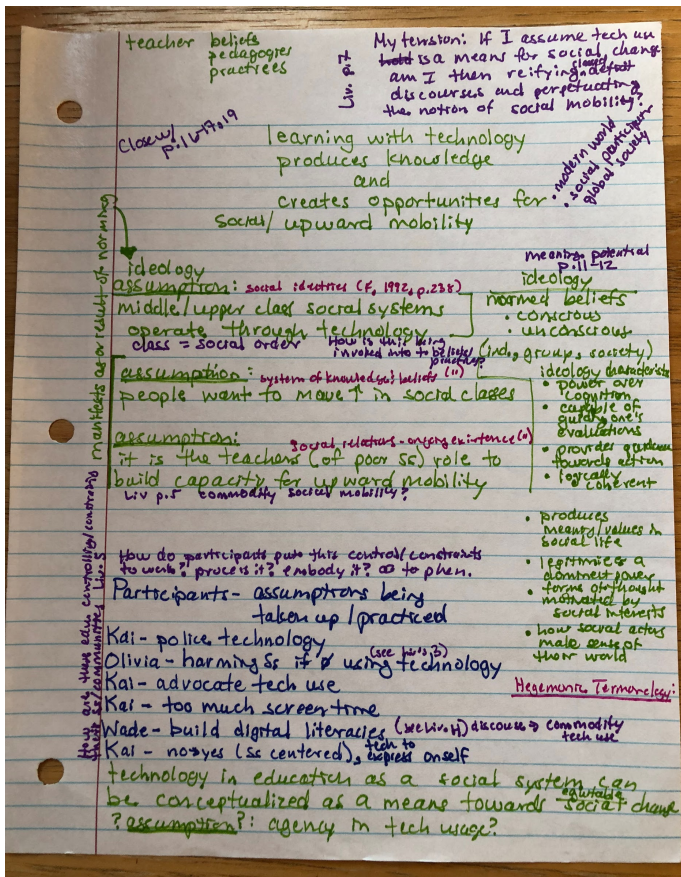
Operating with the assumption that multiple ways of knowing (language, sense perception, emotion, reason, imagination, faith, intuition and memory) are necessary to understand the complexities of how the world works, I needed to ask myself in this finding, (1) *What ways of knowing/being might I be privileging?* and (2) *What ways of*

knowing/being might I be marginalizing? (in technology integration beliefs, practices, discourses and societal ways of being) (RPRJ, 3-26-18). I synthesized dominant U.S. culture as a social system that privileges reason, English language and memory grounded in understandings of the individual as a primary unit; a winner/loser binary to protect property/wealth/entitlements; and linear thinking based upon cause-and-effect relationships (RPRJ, 3-15-18). In this construction of sense-making, technology integration is positioned to privilege the benefits of the individual over the greater good for the whole community/society. As a result, the purpose and practice of using technology in education reifies ways of knowing/being which align with securing and/or maintaining property/wealth/entitlements. Being skeptical of technology integration for social change resurfaced the importance of explicitly encompassing multiple ways of knowing/being in elementary technology integration to create the possibility for transformational social change through inclusive beliefs and practices (RPRJ, 3-23-18).

For this reason, I revisited the phenomenological materials with the analytic question, *"Is it possible for equity-minded educators integrating technology to concurrently strive to facilitate learning opportunities with technology as a means for social change while unintentionally legitimizing dominant forms of social knowledge, beliefs and identities through social relations?"* (RPRJ, 3-23-18). This questioning aided in pressing against binary social practices and discourse. For example, I initially understood Olivia's desire to "figure out, how is that [not using technology very much] hurting or not preparing my students for the future" (Olivia's interview, 12-30-17) as Olivia questioning the broader social impacts of her beliefs, practices and her role as an

equity-minded educator. Yet, after problematizing my tension, another reading of Olivia's except could shed light on the ways social mobility is commodified, produced and reified in classist social systems. The first reading indicated Olivia stepping into questioning her practice when a perceived moment of injustice emerged. Subsequent readings indicated a moment when the discourse commodifies her role in perpetuating upward social mobility through preparation of her students for a distinct privileged form of their future. In this case, the social structure may have been embodied in the ideology and materialized in the phenomenon (RPRJ, 3-26-18).

Thinking critically about how social practices operate in schooling invoked the necessity of working across the complexities of multiple assumptions and interpretations. Questioning societal implications of technology integration through multiple, and at times complex, perspectives decenters binaries and a singular way of knowing and being in which the in-between-ness (Jackson & Mazzei, 2013) of discourse produces movement amongst social structures and social practices. For example, during the professional learning cohort, Wade began to check his assumptions and developed a consciousness about digital literacies and social implications of his technology integration beliefs and practices (Wade's interview, 1-8-18). This discourse prompted a change in Wade's instructional practices, initially a shift occurred in the ways Wade privileged developing digital literacies as an act towards more equitable technology integration. As he perceived a broader implication of digital literacies as an equity issue, he made shifts within his practice and school system in the development of a modified version of flipped instruction.

Another example of thinking about social structures and social change taking shape in the pursuit of more equitable technology integration was how fear of impact prompted Olivia into action. Olivia questioned her beliefs and teaching practices regarding the future social and financial opportunities of her learners. In her role as an educator, Olivia acted upon others through discourse, beliefs and practices. As she became aware of the depths of the digital divide Olivia "felt challenged to find ways to incorporate technology beyond just practicing skills" (Olivia's follow-up, 4-12-18). She felt compelled to survey families during conferences to learn about their access to and usage preferences for technologies. Olivia then used that information to guide new technology tool selections. She focused on tools that facilitated student voice. Olivia began to integrate the WriteReader Classroom app for her learners to develop digital literacies and communication skills in inclusive ways within her classroom community and beyond. Olivia's fear of societal implications prompted a shape-shifted discourses as a mode to act upon the world and pursue social change. Olivia's pursuit of more equitable technology integration took shape through expanded technology integration beliefs and small shifts in her practice. While Olivia's beliefs and practices may motivated by social ideology and discourses around her students' social mobility, her shift in technology integration practices indicates movement towards more inclusive technology integration.

A third example of underlying movement in technology integration equity work was made visible when thinking with discourse as a mode to represent social meaning (Fairclough, 1992). Kai's discourse around being the 'technology police' represented

social meaning through her role as an educator. Kai's perceived role of an elementary educator constituted and was constituted by social structures contributing to the meaning-making through systems of knowledge, beliefs and social practice. Kai questioned societal implications of being the technology police in her elementary classroom. Her unconscious social practices informed her social identity as an educator. As Kai examined her enactment of being the technology police in our professional learning cohort, she critiqued her technology integration beliefs and practices. Specifically, Kai explored the tensions amongst her technology integration beliefs and practices. In this process she learned how she could enact an equity-orientation in her role educator with technology integration. Kai's change shifted the representation of social roles in which educators do not restrict technology use, rather they "consider the use of technology as a vital human right" (Kai's cohort artifact, 12-2-17).

Each of these examples illustrates how participants experienced and navigated the in-between-ness of their pursuit of more equitable technology integration. I used the social theory of discourse (Fairclough, 1992) to aide in the decentering of binaries and unpacking of (a) underlying technology integration beliefs and practices at work, and (b) the lived experiences of educators as they evolved throughout professional learning experiences. In sum, the provocation of *questioning societal implications* in education as a vivid illumination of the phenomenon was a social system construction representing the making and unmaking of social change in elementary education. Another conception of social change towards more equitable technology integration is achieving homeostasis within a technology integration ecosystem, which is discussed in Chapter 8.

Chapter 8: Achieving Homeostasis (in a Technology Integration Ecosystem) -

A Vivid Illumination of the Phenomenon

"An ecosystem is an open and dynamic system,
with things constantly entering and leaving.
But ecosystems have the tendency or ability to achieve homeostasis
or internal equilibrium a key ecological phenomenon…
We contend that a school and its classrooms can be viewed as an ecosystem
because they make up a complex system containing many parts and relationships,
with both biotic components (e.g. teachers, students, parents, and administrators)
and abiotic components (e.g. physical setting, location of the computers, grades,
and subjects taught).
Within the school, teaching librarians, students, books,
dictionaries, projection devices, workbooks, desks,
and other "species" interact with each other
in certain ways to form a system that enables learning to take place…
Just as in a biological ecosystem, the teaching ecosystem exhibits diversity
in that it contains many types of species,
each having a different set of characteristics
and playing a different role (occupying a unique niche) in ecological terms.
The species' characteristics and roles constantly affect one another,
thereby constantly modifying their interrelationships."

- Dr. Yong Zhao and Dr. Kenneth Frank, in *Factors Affecting Technology Uses in*
Schools: An Ecological Perspective (2003, p. 811-812)

In this chapter, the vivid illumination of achieving homeostasis in a technology

integration ecosystem is discussed as a production of pursuing more equitable technology

integration. Technology integration ecosystems (Zhao & Frank, 2003), Depths of

Knowledge (Webb, 1977, 2002) and the SAMR Model (Puentedura, 2013) are theories

and tools I thought with in this chapter. Throughout this chapter I use Eddie's

phenomenological materials to interpret equity work in technology integration.

Following the professional learning cohort experience, Eddie constructed and shared a

physical artifact he felt represented his learning journey focusing on students' use of

technology tools. Intensities in Eddie's reflective experience offered a glimpse into the ways in which the phenomenon took shape through being conceptualized as a permeable technology integration ecosystem. The dynamic roles and relationships amongst technology tools, learners' use of those tools in the classroom, SAMR and Depths of Knowledge functioned as a system in interrelated ways where learners perceived technology as an extension of their being in the world.

DoK 🔗 SAMR 🔗 Eddie's Professional Learning Artifact

I used an ecological theoretical conception for technology integration (Zhao & Frank, 2003), as discussed in Chapter 4, to better understand the richly contextualized vivid illumination of the phenomenon. Achieving homeostasis (internal equilibrium) within a technology integration ecosystem positions patterns of interactions and mutual adaptations as playing a significant role in the destiny of invader species (technologies) in school systems (Zhao & Frank, 2003). When theorizing technology integration as an ecosystem, I noted where the influences of social systems were absent. I theorized a socially-oriented technology integration ecosystem to aid in the interpretation of the phenomenon through achieving homeostasis when positioning technology integration as a social issue (see Figure 8-1).

Figure 8-1. Social systems operating in a technology integration ecosystem.
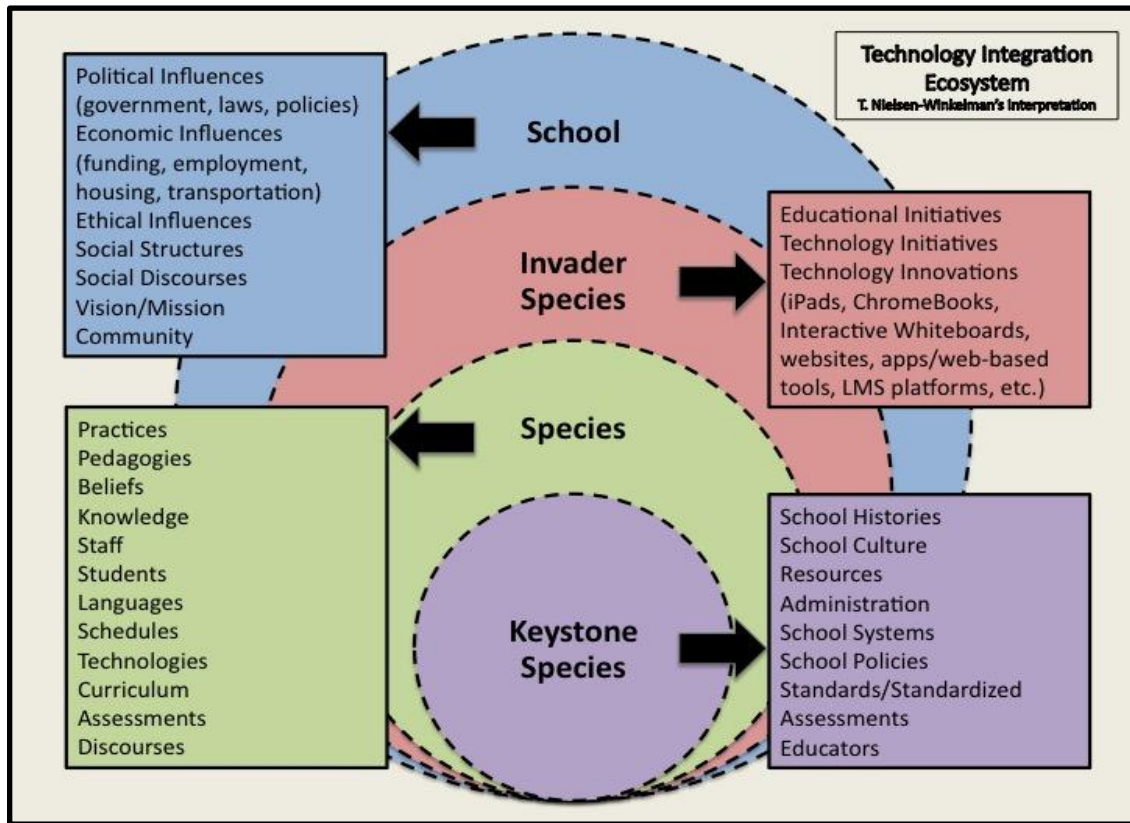
This conception integrates the social, political, economic and cultural aspects of technology use in education. I use my socially-oriented conception of technology integration to explore the provocation of *achieving homeostasis in a technology integration ecosystem* in the following ways. First, I situate Depths of Knowledge (DoK) and the SAMR Model as a foundation to understand Eddie's professional learning artifact. Second, the SAMR | DoK Professional Learning Artifact Eddie constructed as a result of our professional learning cohort is discussed. This artifact is then used in the conceptualization of Eddie's context as an ecological construct; in doing so, I interpreted the social structure using the theoretical conception of technology integration ecosystems. Third, patterns of interactions, mutual adaptations and achieving homeostasis are used to

theorize the analytic question which emerged around the evolution of technology integration as a means of working towards more equitable social change in elementary education.

Depths of Knowledge (DoK). Webb (1997, 2002) developed four levels in which learners exhibit problem-solving skills with increased levels of complexity. In Level 1 information recall builds a foundation. Level 2 uses the information, often in multiple steps, to complete a learning activity/assessment focused on skills and concepts. In Level 3, strategic thinking moves from concrete to abstract in the use of reasoning to solve complex problems/learning activities. Level 4 extends thinking in which analysis, evaluation, and reflection strategies are used to solve complex real-world problems. Depths of Knowledge (Webb, 2002) focuses on the cognitive complexity necessary to acquire, apply, analyze and augment knowledge. The DoK is conceptualized as an invader species in Eddie's technology integration ecosystem. For the purposes of this dissertation, DoK is utilized to understand the phenomenon because it was incorporated into Eddie's teaching practices as a school district initiative and as a prominent aspect of Eddie's SAMR | DoK Professional Learning Artifact.

SAMR. The SAMR Model (Puentedura, 2013) is a technology integration framework commonly used in K-12 classrooms. SAMR may be theorized as another species operating in Eddie's technology integration ecosystem. The SAMR Model categorizes the use of technology within learning tasks across four levels:

- *Substitution* - The technology tool is used as a direct substitute for the teaching/learning task with functional/efficiency improvements.

- *Augmentation* - The technology tool is used as a direct substitute for the teaching/learning task with functional/efficiency improvements.

- *Modification* - The technology tool is used in a way that modifies the teaching/learning task with significant redesign.

- *Redefinition* - The use of the technology tool creates a new teaching/learning task which was previously inconceivable without the technology. (Puentedura, 2012, 2013)

Puentedura's (2013) SAMR Model further categorizes uses of technology as either enhancement (substitution, augmentation) or transformation (modification, redefinition). K-12 educators are often encouraged to use the SAMR Model as a framework to facilitate critical thinking about how they integrate technology into their instructional practices. While this model provides a common language for educators to have conversations about their technology integration practices, there is a lack of peer-reviewed publications (e.g. Linderoth, 2013). The popularity of the SAMR Model may influence in-service educators towards using the model in their practice. Eddie is an example; he utilized SAMR in his professional learning artifact as the social discourses around SAMR operated at the school level in Eddie's ecosystem. SAMR, DoK and district educational initiatives functioned as invader species in the shaping of Eddie's pedagogies and practices.

Eddie's professional learning artifact. Eddie and I engaged in a follow-up conversation to his interview as we sat at the counter in his kitchen. When invited to share how his artifact had evolved since our interview, Eddie shared a draft of something

he was constructing to hone in on student use of technology tools. Eddie sought to blend

the SAMR Model and Depths of Knowledge with technology tools he researched to

diversify his students' digital literacies (see Figure 8-2).

Figure 8-2. Initial construction of SAMR | DoK professional learning artifact created by Mr. Flugelhorn.

Eddie's intent was to challenge the current stable use of G-Suite technology tools

(species) in his classroom through the integration of this resource into his classroom

planning and practices (RPRJ, 2-27-18). In our discussion he shared:

> Eddie: It's a rough copy of where I want to be. Kind of looking at the SAMR model in terms of looking at how my students are using technology within the classroom, and trying to figure out where are they now, and where am I right now, but then my district [is]... in the process of integrating Depths of Knowledge. What I'm trying to do is I'm trying to look at a way to create [a resource hub] ... that my students can just go to. One that they can, depending upon what activity they're going to do, they can look and they can just click on an icon and it will take them to [the technology tool] ... And the problem is going through this process in terms of I'm looking at having two concentric circles, one being for tablet devices like apps, and then one [web-based tools] for computers or ChromeBooks. The issue being that I want to make it so it's free, so the initial digital divide isn't a barrier. I'm trying to find ways that students can do things within the classroom, but it's not going to be cost prohibitive and it's also going to be something accessible within their school issued ChromeBooks. (Eddie's follow up, 2-25-18)

Given that "an ecosystem is an open and dynamic system, with things constantly entering

and leaving" (Zhao & Frank, 2003, p. 811), my theoretical interpretation is Eddie's

professional learning artifact capitalizes on the permeable construct of a technology

integration ecosystem (RPRJ, 2-27-18). Eddie spoke of his SAMR | DoK brainstorms

during our interview (12-31-17) and Figure 8-2 is his initial construction shared during

our first follow-up conversation (2-25-18). Eddie's updated SAMR | DoK Professional

Learning Artifact enacts the dynamic nature of technology integration in his classroom

and school community (see Figure 8-3). Each icon is an active link to their classroom

access of the respective technology tool (Eddie's follow-up, 4-18-18). Eddie's resource

design acknowledged a current district-level initiative to incorporate DoK in instructional

practices; consequently, DoK can be theorized as a species in the technology integration

ecosystem. Further, the design situates technology tools within a layering of academic

language (e.g. SAMR and DoK terms) with accessible learner-friendly phrases (e.g. same

same, change the game) while concurrently noting the fluidness of tool uses amongst the

categories. The design is such that tools can be swapped in and out of the resource based

upon student feedback and new technology developments (Eddie's follow-up, 5-27-18).

Figure 8-3. Updated SAMR | DoK professional learning artifact created by Mr. Flugelhorn.
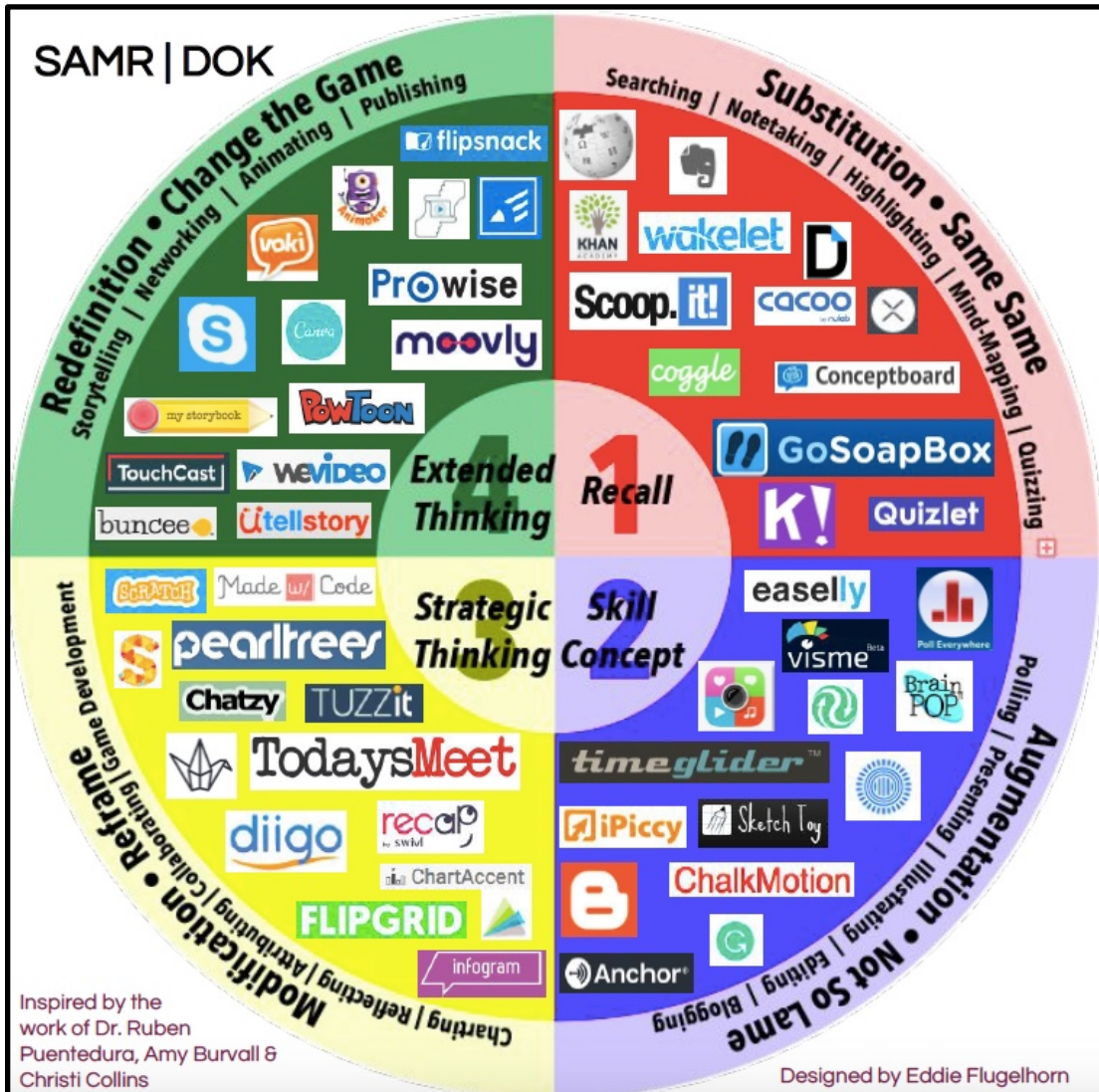
Specifically, Eddie represented components of both his classroom and school community in this professional learning artifact and expanded upon them during our interview follow-up conversations (RPRJ, 5-28-18). These classroom and school community components may be conceptualized as an ecological construct. In a post-reflexion (4-20-18) about the internal social structure of Eddie Flugelhorn's fifth grade classroom, nested

within the multilevel ecological hierarchy (Zhao & Frank, 2003) of South Hampton

Institute of Technology within Rhodes Area Schools, I interpreted the following ideas:

- Eddie Flugelhorn (teacher) is a keystone species.

- South Hampton Institute of Technology (elementary school) is a keystone species.

- Rhodes Area Schools (school district) is a keystone species.

- Learners are existing species.

- Classroom norms and practices are existing species.

- Teaching beliefs, pedagogies and practices are existing species.

- IBO (pedagogical/teaching practice initiative) is an existing species.

- SmartBoard (technology) is an existing species.

- Collaborative tables (flexible furniture) are existing species.

- Depths of Knowledge (pedagogical/teaching practice initiative in the district) is an invader species.

- 1:1 ChromeBooks (technology) are both species and invader species[32], depending upon the particular tool and its use.

- Uses of technology tools are invader species.

- The SAMR Model (pedagogical/teaching practice initiative) is an invader species.

- SAMR | DoK Professional Learning Artifact (pedagogical/learning tool) is an invader species.

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[32] While teaching in a 1:1 setting is a normed practice for Eddie this school year (in this school community) he had to transition from MacBooks to ChromeBooks. Therefore, ChromeBooks are categorized as an invader species.

This complex system, with its many parts and relationships, interact in particular ways to enable learning. Social discourse in the school layer of the technology integration ecosystem around Bloom's Taxonomy (1969) prompted a shift to DoK as an educational initiative in the district beginning fall of 2017, thus positioning DoK as an invader species. DoK and Bloom's Taxonomy interact and are in a relationship with aim to shape-shift species (e.g. knowledge, curriculum, pedagogies, practices). Another example of interaction within the technology integration ecosystem to enable learning is how educators (keystone species) employ 1:1 Chromebooks (invader species) as a teaching and learning practice (species) to achieve aspects of the district's vision/mission (school). Each element serves a role in enabling student learning. Further, the interactions and relationships amongst them within the technology integration ecosystem influences the complex internal social structure.

In order to explore complex learning systems, it is crucial to understand the motivation behind the parts included in the system including their roles and relationships. This section share my theorizing of the system parts that Eddie shared in our conversations together. In order to analyze the phenomenological materials at a deeper level, I sought to uncover the motivations for Eddie's technology integration practices.

"Have Notsville" and "Havesville"

In Eddie's cohort artifact (11-18-17) he drew a technology bridge connecting what he terms as "Have Notsville" and "Havesville" (see Figure 8-4). Additionally, he generated the inquiry prompt, "How do we utilize technology to narrow the opportunity gap for our classroom learners?" (Eddie's cohort artifact, 11-18-17) when the cohort

explored the topic of digital divides. Technology as a metaphorical bridge in this visual

representation demonstrates Eddie's consciousness of the digital divides in education as

an equity issue (Eddie's interview 12-31-17; RPRJ, 1-15-18). Eddie noted that the

discrepancies between "Have Notsville" and "Havesville" are more than the initial and

secondary digital divides. Pointedly, technology use is perceived to diminish or

aggravate social inequalities (e.g. participation and powerful engagement in social,

political and economic systems) (Eddie's interview, 12-31-17; RPRJ, 1-15-18).

Figure 8-4. Havesville vs. Have Notsville (Eddie's cohort artifact, 12-2-17).
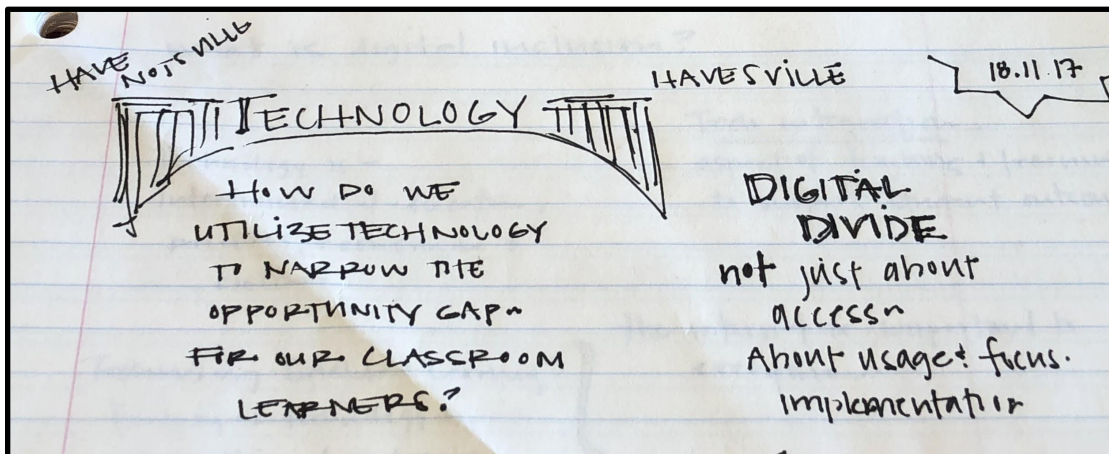
Another example representing Eddie's understanding of technology integration as

a complex system is shown in Figure 8-5 (Eddie's cohort artifact, 12-2-17; RPRJ, 4-25-

18). In this artifact Eddie noted, "Technology-enabled learning leverages technology in

conjunction with pedagogy and best practices to facilitate ALL learners engaging with

meaningful content and authentic learning from and with technology" (Eddie's cohort

artifact, 12-2-17). This note combined with his illustration on the lefthand side of the

artifact indicates how he understands the roles and relationships of the ecosystem's parts

(species) for digital inclusion[33]. The illustration represents how meaningful content, access to technology, technology uses, pedagogy and best practices each interact with students to enable authentic learning within the technology integration ecosystem. My socially-oriented conception (represented in Figure 8-1) of a technology integration ecosystem is useful in thinking through the interactions Eddie illustrated amongst keystone species, species and invader species that influence achieving homeostasis. Digital inclusion is Eddie's vision (school). Eddie (keystone species) interacts with content, technologies, pedagogies and beliefs about best practices (species) that influence the ways in which he leverages technology use (invader species) to achieve homeostasis by enacting his vision.

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[33] Eddie defined *digital inclusion* as equitable social participation through the ability of individuals and groups to access and use ICT. (Eddie's cohort artifact, 12-2-17).

Figure 8-5. Leveraging technology for authentic learning and equitable social participation (Eddie's cohort artifact, 12-2-17)
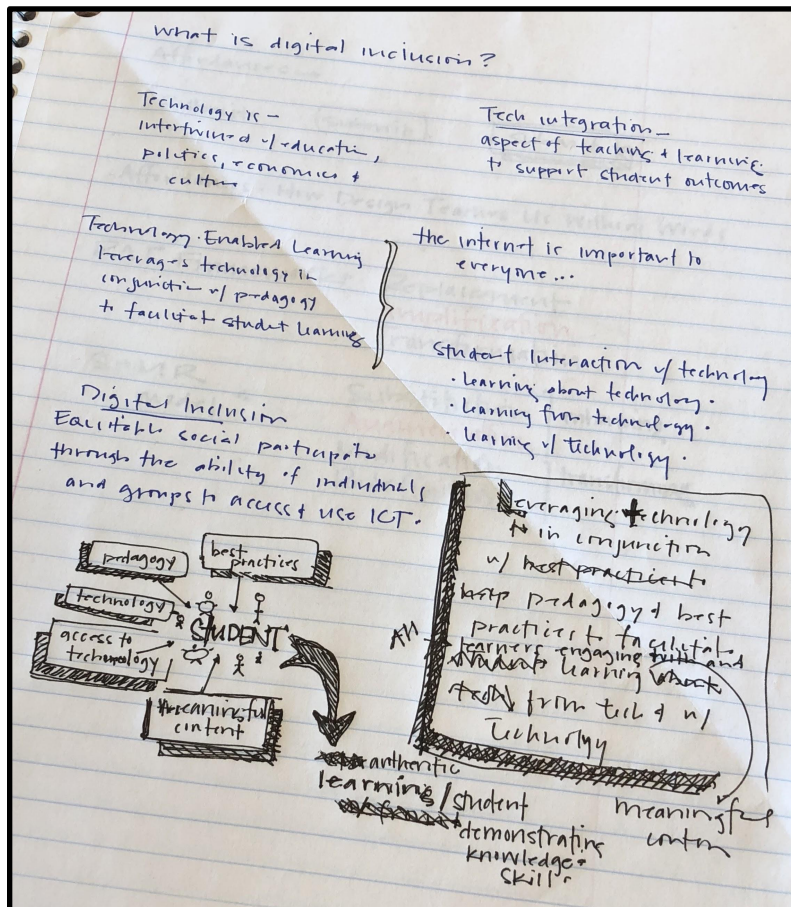
With these artifacts in mind as Eddie's experiences of the phenomenon, I was drawn to

the following moment of intensity highlighting Eddie's motivations in one of our follow-

up conversations:

> ... one of the things that's so important to understand is the *WHY* behind what we do. No matter what, what is your goal?... As a teacher I lead with the importance of *EQUITY WORK*… It is important to me that I am consistently engaged in equity work when I look at my students, when I look at who I am. I think it is important that we continue to grow as educators. I feel that this [professional learning cohort] was a way to continue my growth and improvement over time as an educator, as an educator of 21st century learners, as an educator of *DIVERSE* learners in terms of *DIVERSITY* of culture, *DIVERSITY* of race, *DIVERSITY* of wealth… The reason I participated was to find ways to help my students, and to

make technology more accessible and how do we work as educators to narrow the opportunity gap. (Eddie's follow-up, 2-25-18, emphasis added)

Eddie's *why* of looking at equitable classroom access and usage of technology was a means to support and empower his diverse learners. In this way the socially-oriented conception of a technology integration ecosystem (see Figure 8-1) may be employed to amplify critically-oriented commitments. The social complexity intertwined throughout the community of organisms (i.e. schools, invader species, species, keystone species) function as an ecological unit. Eddie's phenomenological material exemplifies critically-oriented equity work in his technology integration ecosystem. Eddie noted the "*DIVERSITY* of culture, *DIVERSITY* of race, *DIVERSITY* of wealth" (Eddie's follow-up, 2-25-18, emphasis added) which can be interpreted as social structures present in his school. The conceptualization of digital inclusion permeates through his growth as an educator. It permeates through his students and technologies. Digital inclusion as a vision permeates through the educational and technological initiatives (e.g. DoK, SAMR, use of technology tools). It permeates the learning community. Digital inclusion in this critically-oriented technology integration ecosystem permeates the opportunity gap with political, economic, ethical and social influences. The amplification of critically-oriented commitments in the socially-oriented conception of a technology integration ecosystem is one way the digital divides as social divides modify dynamic relationships in the process of achieving homeostasis. To this extent Eddie shared:

> [paying attention to digital divides as equity work] gets me to slow down in terms of, I'm more aware and intentional of what I'm doing… it's really getting me to slow down in terms of, why am I doing this? What's my goal?... then what do I need to do to make sure we get there in equitable ways using these [technology] tools? (cohort artifact, 12-6-17)

Eddie recognized that technology is intertwined with education, politics, economics and culture (Eddie's cohort artifact, 12-2-17), and that technology can be leveraged for equitable participation in society, so his lived experience evolved through the process of slowing down in his instructional decision-making (RPRJ, 2-27-18). Slowing down to foster intentional practices positioned Eddie as a keystone species to more systematically interact with other species to form an ecosystem that enables more equitable learning opportunities to take place with the use of technologies. This intentional move to consider equitable uses of technology in the planning of learning experiences aligned with his aim to narrow the opportunity gap.

Technology Integration as Equity Work = Achieving Homeostasis

I analyzed Eddie's SAMR | DoK Professional Learning Artifact again in order to theorize with the technology integration ecosystem's concepts of diverse species, roles and relationships (Zhao & Frank, 2003) (RPRJ, 4-25-18). This iteration of the analysis was informed by the analytic question, *"How might the pursuit of more equitable technology integration be conceptualized as ecological to achieve homeostasis (internal equilibrium) through the mutual adaptation of patterns of interactions (competition/cooperation of species), keystone species (educators), and invader species (technologies)?"* In the analytic process I explored patterns of interactions in the phenomenological materials and interrogated these patterns of interactions to unpack what, if any, mutual adaptations occurred in the internal structures of school/classroom ecosystems. I concluded with conceptualizations of how, if at all, the phenomenon achieved homeostasis (internal equilibrium).

Patterns of interactions. Zhao and Frank (2003) situate technologies (species),

as playing different roles when within ecosystems. In this research, each technology and

its corresponding role occupy a unique niche in the technology integration ecosystem.

Patterns of interactions amongst the species, whether considered to be cooperative or

competitive in nature, influence how/if homeostasis (internal equilibrium) is achieved.

To this end, Eddie and I discussed how he pursued more equitable technology integration

though the interactions of technology tools, technology use (teacher and students),

SAMR and DoK.

> Tiffany: This artifact is really intriguing! A couple of things, I heard
> you trying to hone in on student use of tools… I see the frame of
> SAMR, around the outside of your ring, how did you make some
> of these [tool] decisions in your design matchup with DoK in the
> center? (see Figure 8-3)
>
> Eddie: I think… for the most part when we look at that recall [in DoK],
> that is more substitution [in SAMR]…   It's not a perfect kind of fit
> - the matchup between DoK and SAMR - it's not a one to one
> correspondence. There's some gray areas... depending upon the
> program, or the app, it can be used in all four. It just depends upon
> the use of the technology tool, and how it's developed, and I think
> the question that's asked of the students, and the learning activity
> that the students are doing.
>
> Tiffany: Can you give an example of that? A tool, or a piece of SAMR
> that you feel could work across Depths of Knowledge? Or does
> the work[ing] across varied by the task?
>
> Eddie: I think just something simple like Explain Everything[34]…. when I
> flip my classroom instruction in mathematics, and I do that mainly
> just because a) I don't think whole group is necessarily as
> productive as it needs to be when I have fifth graders that range
> from mathing at a first grade level, and fifth graders that are
> mathing at a sixth or seventh grade level. Whole group instruction

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[34] Explain Everything is an interactive whiteboard platform with app and web-based options. Explain Everything can be used to create tutorials, animated stories, presentations and much more. The technology tool's affordances facilitate multi-model expressions of thinking and understanding through the use of images, drawings, text, videos, and audio. Explain Everything also facilitates collaboration, cloud saving, feedback and publishing options through an app (via iTunes), G Suite, Dropbox, OneDrive, iCloud, YouTube, Zoom and box.

is not as successful as it needs to be, but being well aware that as a fifth grade teacher I am obligated to teach the fifth grade curriculum to all fifth graders. I usually use Explain Everything as a substitution for me teaching… I teach the normal [whole group] lesson, but my students will watch that. I [also] think it [Explain Everything] can be used for presenting. It can be used for students to show what they know in terms of number talks - having the students be able to use Explain Everything to kind of show and work through a problem, or as a group they're working through strategies to solve a problem. It [Explain Everything] can be collaborative in terms of if I give them an iPad, they can all work collectively… they can rewind, they can re-record they can go back, or it can be used in storytelling… it can be used throughout… the SAMR model just depending upon a) what question you're asking of your students, and then b) what your students want to do…

Tiffany: So, I hear two distinct pieces there. The first being the teacher provided learning tasks that are in the [SAMR and DoK] frames, and the second being an open endedness in how students pick it [Explain Everything] up for creating a product to show what they know.

Eddie: Yes. (Eddie's follow-up, 2-25-18)

Explain Everything, SAMR and DoK as invader species were used in fluid ways by existing and keystone species (learners and Eddie) (RPRJ, 5-29-18). Eddie as a keystone species with influence in/over the ecosystem made decisions in alignment of SAMR and DoK components. He positioned them as cooperative (e.g. recall in DoK as similar role and function of substitution in SAMR, the role of Explain Everything as substitution in the flipping of content delivery for math instruction) (RPRJ, 5-29-18). Further technology use, in this example the teacher's and students' use of Explain Everything, were cooperative in their interactions within a variety of niches in the classroom. For instance, the relationship of the SAMR | DoK Professional Learning Artifact as an invader species with the use by Eddie and his students was fluid with integration of Explain Everything. The role of Explain Everything within the SAMR | DoK

Professional Learning Artifact shape-shifted based upon the selected purpose of learning tasks either assigned by the Eddie or chosen by students' choice (RPRJ, 5-29-18). Splayed a significant role in the permeable nature of Eddie's SAMR | DoK Professional Learning Artifact which occurred in two ways. First, the educator practices position the use of a tool to permeate the DoK | SAMR lines depending upon purpose. Second, student-initiated technology tool uses permeate technologies, practice, curriculum and initiatives. The cooperation amongst diverse species modifies species' relationships and the ecosystem. Thus, the ways in which Eddie established the SAMR | DoK Professional Learning Artifact and facilitated the use of technology tools positioned patterns of interactions as cooperation amongst species in the ecosystem.

However, theorizing patterns of interactions amongst the species within Eddie's technology integration ecosystem also took shape as competitive with existing practices:

Eddie: I want to force myself as an educator to move away from the substitution and the augmentation realm. I think it's one of those things that by having this [SAMR | DoK Artifact] I think it helps me, I can focus more on the modification and the redefinition side of things. (Eddie's follow-up, 2-25-18)

Eddie was attempting to force himself to move into different categories of SAMR in his teaching. I interpreted the necessity to *force* a change in practice as indicative of a competition with practices in current ecosystem (RPRJ, 2-27-18). The interactions amongst the following species are competing for roles and relationships in the teaching practice niche: Eddie Flugelhorn (keystone species); teaching beliefs, pedagogies and practices (existing species); SAMR Model (invader species); and the SAMR | DoK Professional Learning Artifact (invader species) (RPRJ, 2-27-18). This competition

amongst species is important because in the event status quo prevails and invader species

(e.g. technology integration initiatives, equity-focused educational initiatives) are unable

to permeate existing niches, inequities in education persist.

Another moment which offered a glimpse into the competition amongst species in

this technology integration ecosystem was during an inquiry about the *why* behind the

construction of the SAMR | DoK Professional Learning Artifact:

Tiffany:	So was this [the construction of your SAMR	DoK Professional Learning Artifact] then a tangible way for you to take our discussions around technology use opportunity gaps and address them with a visual representation?
Eddie:	Yes. For me if it's there, then that connection is a little bit [easier to push], versus I think there's a certain level *for me especially* if it's out of sight it's kind of out of mind, you kind of forget that aspect of it, I think… But it's just more that consistency in terms of how do I prepare and how do I allow and create space for students to extend to build upon their thinking, versus just this is what you've learned now regurgitate it back to me in some way shape or form. (Eddie's follow-up, 2-25-18, emphasis added to represent an embodied moment)

In this moment Eddie pulled his body back from a leaning position with both arms resting

on the counter to sitting straight up placing one hand on his chest as he spoke of "*for me*

especially" (Eddie's follow-up, 2-25-18). I interpreted this moment as the identification

of existing species (teaching beliefs, pedagogies and practices) and himself as a keystone

species at work in the niche. This moment may be interpreted as the use of the SAMR |

DoK Professional Learning Artifact as being in intentionally positioned in competition

with practices in current ecosystem (RPRJ, 2-27-18). The intentional move in this case to

construct a physical reminder for the purpose of pushing the evolution of technology use

as an invader species in the classroom disrupts the 'out of sight out of mind' practice of

status quo. Competition between invader species and existing niches offer a glimpse into the ways school cultures, histories, systems and policies operate as a hierarchy. These niches are established species with particular ways of operating and sustaining their roles in the education system. These sustained cultures, histories, systems and practices are some of the reasons why inequities in power, positioning and privilege are perpetually reified in school systems.

However, competition amongst species also creates social opportunities. One example that illustrates the concept of social opportunity in a competitive pattern of interaction amongst species was in the use of a technology tool competing with classroom norms and practices: Eddie share this example of when a technology tool was in competition with the classroom norms and practices.

Tiffany:	So, thinking about that goal then, the underlying belief that tech should be used to improve the learning process or achieve a learning goal, how does that relate to that product you created linking SAMR and DoK?
Eddie:	I think it is twofold. I think a) it is to help me realize that I need to move around that circle. I think in the past I've been very caught up in the things that I'm very comfortable with. But also, there's a certain level of as a teacher when you think about time my students know this - they know how to do a Google Slide presentation, ok so do a Google Slide presentation - but being able to understand that there's more to technology than Google Slides. Google Slides is a nice beginning. It's a nice gateway into, but we can do more. We should be working more. So that's part of it in terms of that there is more out there that students should be exposed to. And the other part is just making sure… that I am moving around that circle in terms of the Depths of Knowledge [in] what I'm expecting students to do… But I think oftentimes I think I get caught up in with showing their knowledge I have them fall back into that level 1. And oftentimes I think that students fall back into that 1. (Eddie's follow-up, 2-25-17)

In this excerpt, both Eddie's and the students' comfort of and familiarity with G Suite positions other technology tools and their uses in competition with existing species of classroom norms and practices within the technology integration ecosystem. If the roles and interactions of technology tools and their uses (other than the G Suite) are to locate their niche in the ecosystem, they might initially generate discomfort for the teacher and students (RPRJ, 2-27-18). To illustrate, Google Slides represent patterns of technology use interactions with an established niche; whereas diigo competes for the role of knowledge sharing in a different way. A different way of students showing what they know that may initially produce discomfort and disrupt the current ecosystem's homeostasis.

   Mutual adaptations. Zhao and Frank (2003) suggest that an invading species may find it necessary to adapt to the ecosystem while at the same time the ecosystem and its native species may also change. In this technology integration ecosystem, when the SAMR | DoK Professional Learning Artifact (invader species) enters Eddie Flugelhorn's classroom with its norms and practices (existing species) within South Hampton Institute of Technology situated in the Rhodes Area Schools (keystone species), the SAMR | DoK Professional Learning Artifact may adapt to the classroom norms and practices, the learners and the teacher (existing species). At the same time, coevolution may occur as the teacher, learners, classroom norms and practices, teaching beliefs/pedagogies/practices adapt to uses of technology tools within the SAMR | DoK Professional Learning Artifact. To illustrate this theorizing, Eddie shared how the SAMR | DoK Professional Learning Artifact caused a reconceptualization of presentations, while

the use of technology tools blurred the lines in the SAMR | DoK professional learning

artifact::

> ... for much of the year the default for my students was to go to Google Slides [to present their learning] - which isn't a bad thing. I'm not saying 'no' to Google Slides. But I want them to see that oh, a podcast is a kind of presentation. I can make a StopMotion video that is a kind of presentation. So that there are different things that they can do that isn't necessarily make Mr. [Flugelhorn] sit in front of a computer and click forward and click forward and where in all honesty they spend more time with the transitions between the slides than they do with the actual information they put on the slides. So, if I give them different avenues to show their knowledge and I push different avenues to show their knowledge a) they're going to improve their knowledge base with whatever this app or tools is but also, they're going to think about their content knowledge in a different way and work across the Depths of Knowledge. Rather than just putting 400 words on a slide and moving on to the next slide they're going to be thinking about how can I present this? Maybe I will write a script. Maybe I will write a rap. Or maybe I will write a speech that I can vlog on. Or I can put it in prezi. Or I can look at or create graphics that show my learning. Or I can create a timeline. Ultimately, I can use the tool to blur the lines between frames [DoK, SAMR, math, IB, reading] and where they [students] start looking at their knowledge differently through the SAMR | DoK Professional Learning Artifact. Rather than just knowledge in knowledge out they [students] are starting to look at I can manipulate this knowledge and I can analyze and I can use that knowledge to create something… you [students] can try something new and you can learn something and I want them to try things… and just helping them realizing that it's okay to play around in new tools and giving them the permission to a) experiment, and b) to mess up and c) to realize that it is a process but part of it is that it's the journey that you take to get there (Eddie's follow-up, 5-27-18).

Due to Given each technology and its corresponding role occupying a unique niche in the

ecosystem, Eddie's construction and integration of the SAMR | DoK Professional

Learning Artifact may facilitate fluidity and mutual adaptation to achieve homeostasis in

the pursuit of more equitable technology integration (RPRJ, 4-18-18). The use of Google

Slides and diigo, as encouraged by the SAMR | DoK Professional Learning Artifact and

educator practice could facilitate mutual adaptation of technology uses by Eddie and his

students. Working through the discomfort produced by competing species may generate

opportunities to develop digital literacies and implement educational initiatives (such as DoK and improving digital inclusion). In this way, technology integration in the socially-oriented technology integration ecosystem (see Figure 8-1) maybe conceptualized as a social opportunity with mutual adaptations of species.

The pedagogies, practices and use of technologies mutually adapt to achieve greater digital inclusion. Technology tools are used in a variety of ways for students to communicate and connect. Whether it be through writing a rap, producing a vlog, creating a meme or generating an infographic, Eddie is conceptualizing the use of technology tools in new ways across the SAMR | DoK Professional Learning Artifact. In this journey towards digital inclusion the mutual adaptation of species situate technology integration as a participatory practice. Hence, technology-enabled learning opportunities may foster more equitable social participation in our digital world. The ability for learners to communicate and connect in multi-modal ways, through the use of technology tools on a variety of platforms, may facilitate social engagement like the #NeverAgain movement.

Another way a snapshot of coevolution was captured was when Eddie shared teaching moments during the professional learning cohort. When discussing the topic of digital inclusion through his artifact (Eddie's cohort artifact, 12-2-17), he spoke of how learners' uses of technology evolved in his classroom community:

> Technology in my room is not a reward. It's not a punishment. It is just what we do… it's just embedded. I think barely a day goes by where we don't use technology in some way shape or form. The other thing I think is just me being willing to try things. You know and being willing to see what happens. Giving students to opportunity to see me try things and see me discover eh that didn't work out so well and that's okay. We want our students to be reflective. We

want our student to gauge whether something was successful. We want our students to think about 'how can I make things better' when they reflect. One of the things we tend not to do is help our students understand what failure looks like and what we can learn from failure or non-successful whatever you call it. I think that sometimes it is helpful that they see it doesn't always work out. How we use tools and how learners experience the technologies shifts with this approach. It is one way to expand beyond drill-and-kill uses or the same ole same ole presentation in Google Slides. We can improve access and use of technology for equity purposes to communicate and participate in different ways. And I think when we go back to that initial question about where teachers are and why they did or didn't do certain things with technology. I think part of it is a fear of failure on their part. You know they don't want to look like they don't know what is going on. And it goes back to then that control. Well what happens if I don't know the answer or how to do things whatever that fear or anxiety that might go with it. It's just about being comfortable with who you are and being okay with you know that we are all learners. We are all developing an understanding and it's what we do when we a) learn something and b) when we try something and it doesn't work how do we monitor and adjust and I think that's that artful piece of teaching that has large social implications for traditionally marginalized communities to participate in aspects of life - socialization, education, political engagement, economic opportunities. The learners change, and sometimes the teachers change, and the uses of technologies change in the discovery. It is all interconnected. (Eddie's follow-up, 2-25-18)

If the status quo is, "Technology in my room is not a reward. It's not a punishment. It is just what we do… it's just embedded" (Eddie's follow-up, 2-25-18), then it is important to analyze the interconnected spaces and practices in the classroom. The following ideas may be interpreted as mutual adaptations in this ecological conception of technology integration within Eddie's classroom:

- *Uses of technology tools ← → SAMR | DoK Professional Learning Artifact*: The SAMR | DoK Professional Learning Artifact produced adaptations in how learners used technology tools to communicate their thinking. For example, Eddie expressed the default technology tool his students used was Google Slides for presentations. As the SAMR | DoK Professional Learning Artifact was

introduced into the ecosystem the uses of different technology tools evolved (e.g.

podcast, StopMotion video, script, rap, speech on a vlog, Prezi, graphics,

timeline). Additionally, this evolution of how technology tools were used to

communicate thinking through the use of the SAMR | DoK Professional Learning

Artifact not only changed the tools and their purposes with different avenues to

show students' knowledge, it also pushed learners in thinking about their content

knowledge in different ways. As the uses of tools shapeshifted how learners

worked across the Depths of Knowledge, it blurred the lines between frames

[DoK, SAMR, math, IB, reading]. Students started looking at their knowledge

differently through the SAMR | DoK Professional Learning Artifact. The artifact

evolved with the introduction, survival, adoption, and, at times, dismissal of

technology tools, their uses and their niche within SAMR | DoK. Therefore,

mutual adaptation occurred - as the uses of tools evolved so did the SAMR | DoK

Professional Learning Artifact. (RPRJ, 4-25-18)

- *Uses of technology tools ← → teacher ← → learners*: The intentional arrival and

  integration of the SAMR | DoK Professional Learning Artifact produced

  adaptations in the Eddie. Specifically, he made explicit moves in his teaching to

  give his students the opportunities to see him try using new technology tools (or

  using technology tools in new ways). In this process his students would see him

  discover 'eh that didn't work out so well and that's okay'. This adaptation could

  produce an adaptation in his students' reflective practice and approach to using

  technology tools. Eddie and his learners took up a heightened level of comfort in

trying new uses of technology as part of the learning process and combined it with

a reflective monitoring and adjusting of practices. Mutual adaptations occurred

amongst the uses of technology tools, the teacher and the learners - the 'artful

aspect' of teaching and learning (RPRJ, 5-29-18).

Thus, the interconnectedness of species (keystone, existing, invader) in an elementary

education ecosystem integrating technology produced mutual adaptations. Through

interactions and adaptations members of the ecosystem develop uses of technology which

may position learners to participate in the multiple aspects of life - socialization,

education, political engagement, economic opportunities (RPRJ, 2-27-18, 4-25-18, 5-29-

18)

Achieving homeostasis - Interpretations of technology integration ecosystems

in the pursuit of social change. Zhao and Frank (2003) describe technology integration

ecosystems as open and dynamic and having the ability to attain homeostasis. This

internal balance is achieved through interactions of the species with each other and the

ecosystem. Like Zhao and Frank (2003), I identified metaphorical bridges to understand

technology uses in elementary schools; however, the metaphors I identified were

representative to the phenomenological materials in this dissertation (e.g. Eddie

Flugelhorn as keystone species, learners and classroom norms/practices as existing

species, uses of technology tools and the SAMR | DoK Professional Learning Artifact as

invader species). Zhao and Frank's (2003) conclude that, "the process of technology

adoption is one of coevolution… [whereby the invading species] may need to adapt to the

ecosystem it enters, it can also change the ecosystem" (p. 831). Through mutual

adaptations, such as uses of technology tools ← → SAMR | DoK Professional Learning

Artifact and uses of technology tools ← → teacher ← → learners, Eddie's ecosystem

changed through his lived experience of pursuing more equitable technology integration.

When asked how he would describe the evolution of technology integration in his

classroom after his involvement in our professional learning cohort, he expressed these

ideas:

Eddie:	You [know] the one thing when I think about where my students are, knowing we are in the most technologically advanced [time period] of anything... I think about like my phone has more power, more memory, more ability than the first computer and you think about where you students are. It's one of those things like… *they look at technology as just like part of them*. You know that it's just part of them.
Tiffany:	Because they've never known any different. (crosstalk)
Eddie:	Exactly. So as a teacher you know... The number of things 'Like oh, I wonder how we can figure that out.' [The students respond] "Well, Google it". They didn't have to use an encyclopedia or microfiche - or whatever those scrolling things are.
Tiffany:	Oh gosh yeah.
Eddie:	I want them to continue to think that *technology is an extension of them*, but I also want to give them an opportunity to realize that how much it [technology] can extend them is what's important with it. That it's [using technology is] more than just sending you know, you know... 💩[poop emojis] to their friends. That it's also we can also use it for much greater things. And not that the 💩 and sending things to your friends isn't great, it's also what they are able to do beyond that - what *they're able to create and deconstruct and reconstruct and you know design and really change their world, and the hopefully the outside world as they do it*. (Eddie's follow-up, 5-5-18, emphasis added)

I theorized Eddie's professional learning artifact capitalizes on the permeable constructs

of a technology integration ecosystem (RPRJ, 2-27-18). The permeability of the

technology integration ecosystem is one in which students perceive technology as a part

of them, an extension of their being in the world (RPRJ, 4-25-18). In this permeable

ecosystem, technology use, in this permeable ecosystem, is perceived to diminish or aggravate social inequalities (e.g. participation and powerful engagement in social, political and economic systems) (Eddie's interview, 12-31-17; RPRJ, 1-15-18, 4-25-18). Through understanding the roles and relationships of the ecosystem's parts (species) dynamic homeostasis for digital inclusion may be achieved. In turn, addressing the primary research question of *"Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?"*, the pursuit of more equitable technology integration took shape by way of a participant striving for homeostasis in their classroom and society by way of digital inclusion.

Wherever teachers and learners begin with their uses of technology in the pursuit of more equitable technology integration, what is important is the interactions of meaningful content, access to technology, technology uses, pedagogy and best practices to enable authentic learning (Eddie's cohort artifact, 12-2-17). In viewing digital divides in education as an equity issue (Eddie's interview, 12-31-17; RPRJ, 1-15-18), the ways in which species interact, mutually adapt and achieve homeostasis may produce opportunities for social change. In moments of intensity in the technology integration ecosystem, such as when learners were "*able to create and deconstruct and reconstruct and you know design and really change their world, and the hopefully the outside world as they do it*" (Eddie's follow-up, 5-5-18), the pursuit of more equitable technology integration sprouts a new rhizomatic offshoot of students leveraging technology for equitable participation in society.

In this chapter, the vivid illumination achieving homeostasis in a technology integration ecosystem was theorized through social structures in the roles, relationships and mutual adaptations of diverse species in the pursuit of social change. Intensities in Eddies' reflective experiences and the creation of his SAMR | DoK Professional Learning Artifact student resource hub helped me to better understand his experience of the phenomenon. Through these artifacts we discovered Eddie's intent was intended to challenge the current status quo and marginalization practices in education. In this way the phenomenon produced new intersectional ways of thinking about the permeable and dynamic nature in enacting more equitable technology integration. Chapter 9 serves as a synopsis of the dissertation and offers equity-focused plausible possibilities for the fields of learning technology, elementary education and teacher preparation. An invitation is extended for readers to engage in critical technology integration in elementary education with the perspective of collective guardianship.

Chapter 9: Concluding Thoughts - We are the Guardians of Humanity

We like to think we are rational beings.
Humane, conscientious, civilized, thoughtful,
but when things fall apart even just a little,
we're no better than animals.
We have opposable thumbs; we think, we walk erect, we speak, we dream,
but deep down we're all just rooting around in the primordial ooze.
Biting, clawing, scratching out an existence in the cold dark world
like the rest of the tree toads and sloths.
There's a little animal in all of us
and maybe that is something to celebrate.
Our animal instinct is what makes us seek comfort, warmth, a pack to run with.
We may feel caged.
We may feel trapped
but still as humans, we can find ways to feel free.
We are each other's keepers.
We are the guardians of our own humanity
and even though there is a beast inside all of us,
what sets us apart from the animals is that we think, dream, feel and love,
and against all odds,
against all instinct
we evolve.

- Meredith Grey, in *Grey's Anatomy - Where The Wild Things Are*,
Season 4, Ep.12 (emphasis added)

This final chapter provides a synopsis of this dissertation in respect to the pursuit of more equitable technology integration. Concluding thoughts of this dissertation are discussed as I invite you as readers, as scholars and as educators to engage with my three social issue → social opportunity conceptions:

1. Wobble [within the Technology Integration Ecosystem];

2. Be Profoundly Present [in the Entanglements]; and

3. [Temper] Being and Becoming.

Within each social issue → social opportunity, I share plausible possibilities for the fields of learning technologies, elementary education and teacher preparation as means of social change towards a more just future. I also articulate productive speculations and limitations of the study. This chapter closes with a creative act. I turned myself over to the craft and my own phenomenological experience of what was produced, provoked and took shape by pursuing more equitable technology integration, in an excerpt titled, *"We are the Guardians of Humanity Through Technology Integration."*

Research Synopsis

I opened this dissertation with a description of a social action movement, #NeverAgain – a movement by and for students. This movement was used as a powerful example of what is possible with technologies in changing the balance of power, and, extending voice to marginalized populations. Having situated technology use in elementary education as simultaneously a social issue and a social opportunity, the phenomenon under investigation was the pursuit of more equitable technology integration.

Using post-intentional phenomenology methodology (Vagle, 2018), the following questions guided this dissertation:

- Primary Research Question: Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?

- Supporting Research Question: What are some of the underlying technology integration beliefs and practices at work, if any?

- Supporting Research Question: In what ways, if any, do the lived experiences of in-service educators evolve throughout involvement in professional learning experiences?

Teachers from first-ring suburbs with racially and socioeconomically diverse demographics across three school districts and four elementary school communities were invited to participate in the study. In the end, six elementary educators were selected to participate in the study. The group formed a professional learning cohort engaged in learning experiences concentrated on digital and social divides. After the conclusion of our professional learning cohort, each participant took part in a conversational interview.

I used an iterative process to collect and analyze data which involved a number of phenomenological materials (i.e. cohort artifacts, interview audio/video/transcripts, participant follow-up and a post-reflexivity journal); various theories; and my post-reflexions (including, but not limited to: wonderings, assumptions, intensities, tensions, starts/stops in thinking, embodied responses, problematizing of the phenomenon). Vivid illuminations (findings), regarding the pursuit of more equitable technology integration, were organized into three productions/provocations: unOthering, questioning societal implications and achieving homeostasis in a technology integration ecosystem. Next, I revisit, extend and apply my positionality as a guardian of humanity and present concluding thoughts with productive speculations as discussions and implications of this scholarship.

White Savior vs. Guardian of Humanity

While my privileges - being white, straight, cisgender, female and middle-class - always operate on the ways in which I experience and engage in the world, here I seek to highlight how the collective 'we' operates in this work as each other's keepers. As I expressed in Chapter 5, I strive to take up the role of an ally in challenging the incubation of whiteness and classist beliefs/practices in support of, and in collaboration with, communities that experience marginalization in education. In these concluding thoughts where I claim *'we are the guardians of humanity'*, my aim is to use my privilege and platform to share space and social opportunities towards our collective humanity.

I delineate between being a white savior (or taking up the legacy of white lady bountiful) and a guardian of humanity in that collective action as a unifying force - and conscious participatory action *with, not for, the oppressed* (Freire, 1970/2000) - is crucial to the work of pursuing more equitable technology integration in elementary education. I am but only one member, as an equity-oriented ally, in the *we* of humanity. Together, and only together, in the ongoing work of disrupting and deconstructing oppressive acts with what is/what has been, we may reconstruct a more humane and equitable future. The social issue → social opportunity conceptions serve as an explicit and unwavering invitation to all human beings collectively. I recognize that an invitation to participate in equity-oriented work is not enough; participatory action is essential. It is only through unified participation in the productive struggles, as guardians of an equitable humanity, that we may fracture marginalizing beliefs and practices and reconstruct dynamic social change towards a more just future.

Social Issue → Social Opportunity Conceptions

Throughout this research, it became clear that inequitable technology integration in elementary education, as I anticipated, is a significant social issue. Further, any type of progress toward more equitable technology integration demands continuous critical interrogations of technology integration beliefs and practices as well as how they take shape in the pursuit of more equitable social opportunities. To me, this research can help the field make progress in this regard in three ways. I have chosen to represent my suggestions as social opportunity conceptions: wobble [the technology integration ecosystem], be profoundly present [in the entanglements], and [temper] being and becoming.

Wobble [within the technology integration ecosystem]. When conceptualizing technology integration in schools as ecosystems (Zhao & Frank, 2003) (as discussed in Chapter 4, and *thought with* in Chapter 6's vivid illumination *achieving homeostasis*), underlying beliefs and practices about technology integration are operating in educational spaces. In technology integration ecosystems, beliefs and practices (e.g. a school's histories and culture, selection and disbursement of resources, pedagogies and curriculum, initiatives and innovations, vision/mission and staff) facilitate the achievement of homeostasis. I argue that educators' wobbling within the technology integration ecosystem is one way to disrupt, de-center and de-privilege social practices and systems. Wobbling, conceptualized as movement in one's thinking, believes and practices that generates a disequilibrium. That moment of wobbling is an entry point into seeing ourselves, our beliefs and our practices differently which generates space for reflection and movement toward action.

In particular, this dissertation's vivid illuminations of the phenomenon speak to the wobbling on an individual level within individual classrooms. Through critical perspectives wobbling offered time and space for individuals to consider and tinker with their technology integration beliefs and practices. In the wobbling process, educators may be attentive to change on both individual and systemic levels. The possible disequilibrium between underlying beliefs and practices with what might be conceivable through critical movement is made possible through wobbling. Wobbling with or through something (in this research the pursuit of more equitable technology integration), assumes permeable and malleable constructs. In post-intentional phenomenology, the notion of through-ness signifies movement in a constant state of being, becoming, producing and provoking (Vagle, 2018). In these ways I liken the malleable and permeable aspects of through-ness to the wobbling of individual educators within a technology integration ecosystem.

For Wade, wobbling took shape in his experience of questioning his personal beliefs and assumptions about what students know and can do with technology, which he held on a personal level and were informed by the school's histories. Wobbling also occurred in Olivia's critical reflection of her beliefs and practices around technology use. Conscious tinkering was evoked in her thinking regarding the constraints on learners' social opportunities if her (non)action regarding limited technology use in her classroom persisted. In this way, Olivia's individual beliefs and practices wobbled. This was made possible by the permeable and malleable constructs operating in her experience of the phenomenon as she questioned individual and systematic implications of technology use

in elementary classrooms. De-centering assumptions, beliefs and practices also took shape in the wobbling of Kai's beliefs and practices around technology integration. For Kai, beliefs operated in the discourses of 'being technology police' as a perceived role of elementary educators and their corresponding practices. Kai's personal beliefs and practices were disrupted as she experienced a disequilibrium during professional learning about the digital divides. Kai's social practice (acting upon the world, acting upon each other and representing social meaning) wobbled as she considered what digital inclusion is within an elementary classroom. On an individual level tensions emerged for Kai in the professional learning cohort experience between how a 'technology police' discourse informed her practice and her beliefs about committing to equity work. In these ways, the participants' wobbling created space to reflect and move towards action in their individual classroom technology integration ecosystems.

Ultimately, social practices whereby educators act upon the world, act upon each other and represent social meaning, which are informed by one's beliefs, emerged in the making and unmaking of underlying beliefs and practices as they manifested in different ways in the pursuit of more equitable technology integration. For this reason, looking forward I offer individual beliefs and practices as foci to wobble [within the technology integration ecosystem] as a plausible possibility for next steps in the field of learning technologies.

Plausible possibilities in learning technologies. Technology is "intertwined with education, politics, economics, and culture" (Franklin & Bolick, 2007, p. 34) in ways that inevitably and inequitably impact learners. In this study, the technology is positioned as

permeable and malleable in their relationship with humans, thus de-centering technology as an invader. Emerging from this dissertation, I envision a two-fold opportunity for the learning technologies field: 1) an expansion of Zhao and Frank's (2003) conception of technology integration ecosystem, and 2) a (re)positioning of technology use as an extension of educator/learners in the enhanced technology integration ecosystem.

Conception expansion of technology integration ecosystem. Zhao and Frank (2003) contended that schools are ecosystems, technology usage and educators are species, and technological innovations and educational initiatives are invading species. In this technology integration ecosystem metaphor, "the introduction, survival, and dispersal of an alien [invader] species in a new environment are complex processes" (Zhao & Frank, 2003, p. 808). Zhao and Frank's (2003) point was that contemporary technologies are invader species in school systems and the integration of them are complexly dynamic. Factors influencing technology integration are not to be investigated or understood in isolation, but rather emphasis should be placed on the nature of co-evolving relationships among teachers, students, technology and school/social systems.

When positioning technology integration as a social issue, I acknowledged social structures in my conception of a technology integration ecosystem (as discussed in Chapter 8). Figure 9-1 is representative of Zhao and Frank's (2003) conception of a technology integration ecosystem. My conception of their ecological perspective of technology integration transformed into an updated representation (see Figure 9-2) which emphasizes the ways in which technology is intertwined with education, politics, economics and culture. Further, this conception situates the permeable and malleable

social constructs and places these factors directly within the ecosystem. In addition, this conceptualization links scholarship on technology usage as an influencer on social divides through educational, social, political, cultural, linguistic, economic and institutional contexts (Araque et al., 2013; Gherardi, 2016; DiMaggio & Hargittai, 2001; Leonardi, 2003; Norris & Conceicao, 2004; Selwyn, 2010; Warschauer, 2011a, 2011b; Warschauer, Knobel & Stone, 2004) with Zhao and Frank's (2003) ecosystems as an analytic framework to understand technology uses in schools. Working across these bodies of scholarship builds upon the emphasis to investigate co-evolving relationships among people, social systems and technology use. In which case, individuals are wobbling their technology integration beliefs and practices. As a collective we, each wobbling their individual beliefs and practices through critical perspectives, may use the ecosystem as a tool to better understand how the permeable and malleable relationships and social systems produce, reify and construct and deconstruct each other in the pursuit of social change.

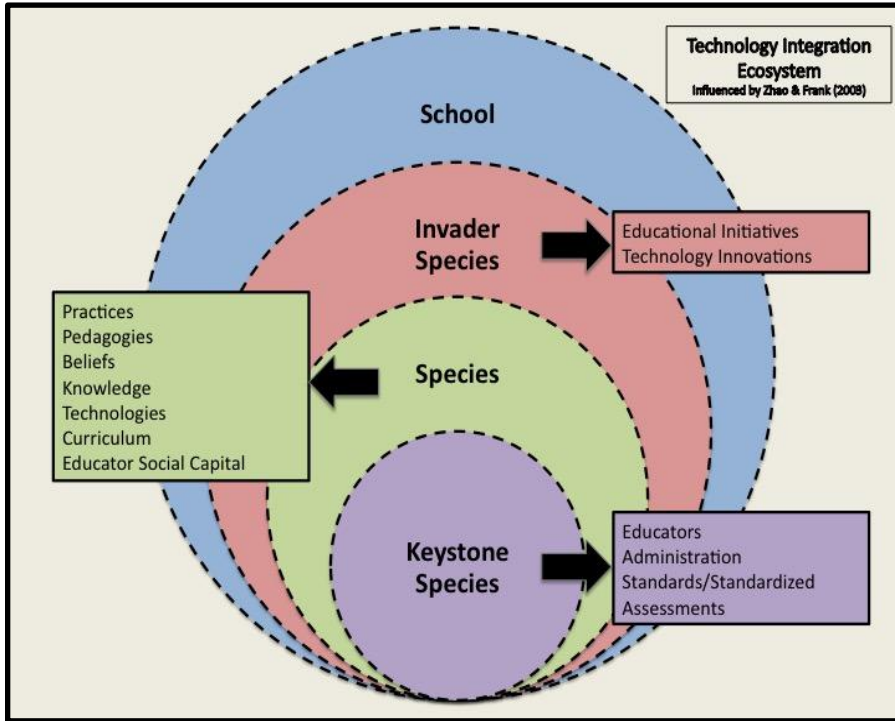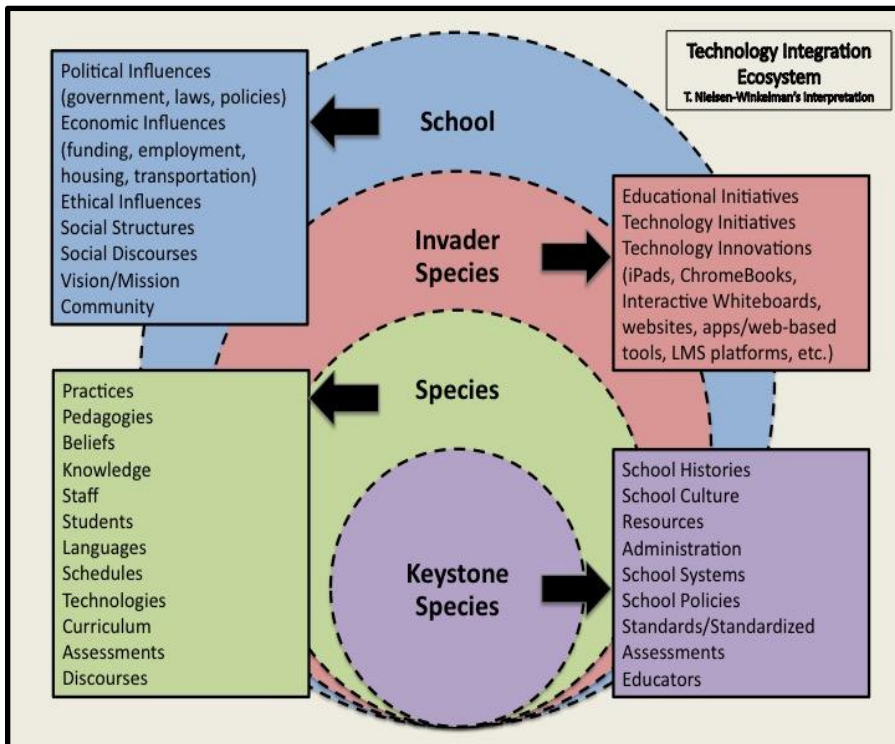*Figure 9-1.* Technology integration ecosystem.

Figure 9-2. Social systems operating in a technology integration ecosystem.

(Re)positioning of technology use as an extension of the educator/learners. The second idea I offer to the field is to de-center technology as an invader in education and (re)positioning it as an extension of the human. In Chapters 1, 2 and 3, technology uses were situated as necessary for social inclusion. As a result, I argued that equity issues around technology use may be conceptualized as a social issue. The ways in which technologies are used holds potential to balance power in social systems and gives voice to those who experience marginalization (Miller, 2016). Araque et al. (2013) suggested that differences in how technology is used may bolster or reinforce social inequities. While technology integration may perpetuate disenfranchisement, Miller (2016) offered that when technologies are used deliberately, they may provide a central role in education for social justice. I also believe that there is space to provoke social change in the pursuit of more equitable technology integration. I draw upon how the phenomenon was produced, provoked and took shape for Eddie as an example.

In a follow-up conversation Eddie shared, "I want them [my students] to continue to think that *technology is an extension of them*" (5-5-18, emphasis added). If the field of learning technologies considers technologies as an extension of oneself, then the malleable-ness in a technology integration ecosystem shifts operating from a species ←→ species perspective, to operating from a role ←→ role perspective. Through this shift, technology use can be seen as more purpose-driven, than object-driven. My interpretation is of Eddie's comment is that technology could be repositioned as an extension of the educator/learner in the world. This explicit repositioning situates technology use as a humanizing endeavor both belonging to and constituting the world,

the self and the other. With this interpretation educators and learners are "*able to create and deconstruct and reconstruct… and really change their world, and hopefully the outside world as they do it*" (Eddie's follow-up, 5-5-18, emphasis added).

This approach for the field of learning technologies both aligns with and extends Miller, Becker and Becker's (2016) scholarship of participatory practices where students engage with the affordances of technology to challenge oppressive forces. I speculate that if technology use was perceived as an extension of the self, then digital inclusion could become a natural part of *the* work we do. In which case unOthering, disrupting social divides and deconstructing/reconstructing social systems could become dynamic learning opportunities for all learners which have the potential to foster social transformations not only in classrooms, but also through social practices, discourses and systems.

Therefore, wobbling took shape on individual levels (a) placed social structures directly into the technology integration ecosystem to emphasize the intertwined nature of education, politics, economics, culture and technology as permeable and malleable social constructs and (b) repositioned an extension of the educator/learner to humanize the integration of technologies in education. In doing so, the inequitable impact of technology integration on learners may be disrupted and de-centered. In this dissertation the wobbling occurred within individual participants' beliefs, assumptions and practices. If multiple educators wobble their technology integration beliefs and practices within one school's technology integration ecosystem then opportunities for broader ecological shifts may develop. Thus, the wobbles of an individual's beliefs, assumptions and

practices can de-privilege existing social practices and systems and can make space to intentionally address the digital divides - social divides cycle.

Be profoundly present [in the entanglements]. Post-intentional phenomenology reminds us to be profoundly present:

> *[B]e profoundly present in our living* - to leave no stone unturned; to slow down in order to open up; to dwell with our surroundings amid the harried pace we may keep; to remain open; to know that there is "never nothing" going on and that we can never grasp all that is going on; and to know that our living *is always a never-ending work in progress*. (Vagle, 2018, p. xii, emphasis added)

Dwelling with this post-intentional phenomenological research was both an intriguing and infuriating experience for me. I found that being still to open up what was being produced and provoked was, at times, counter-intuitive. I craved the movement, the doing. I recall expressing to my advisors and my PIPsters[35], *"I. am. in. the. mud."* As with all post-intentional phenomenological research, the inseparable fluid entanglements evaded a concrete entry or exit point for the phenomenon. Further, the pluralistic nature and in-between-ness of the fleeting and transforming threshold incited a sense of wonder, while concurrently caused me to feel as though I was being kept at bay or investigating the wrong rabbit hole. It was only when I embraced the parallel between being profoundly present in the entanglements of pursuing more equitable technology integration with being profoundly present in the entanglements of teaching and learning, that my own experience with the research methodology and the phenomenological

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[35] A term of endearment for our small community of PhD candidates conducting post-intentional phenomenological research who supported each other with the iterative-ness of this methodology.

materials began to take shape. I found comfort in the 'I've been here before.' I felt a

connection with the craft of the research, just as I do with the craft of teaching.

Teaching is not linear. Teaching is not still. Teaching is fluid and entangled.

Teaching is always a never-ending work in progress. Wherever teachers and learners

enter into the entanglements with their uses of technology, whether it be communicating

with poop emojis like Eddie's fifth graders or employing the affordances of technology to

create content, mobilize virtually and participate socially in virtual spaces like the

#NeverAgain movement, being profoundly present is one way to lean into the tensions

for social change. The craft of integrating technology into elementary teaching and

learning is one that operates in pluralistic and, at times, competing ways.

In order to situate between being profoundly present in the entanglements of

pursuing more equitable technology integration, I revisit some of the literature I reviewed

for this research. Schneider and Smith (2014) asserted that technology has "changed how

we participate in education" (p. 3) with an explicit recommendation to cast a critical gaze

on the relationship between technology and power in schooling. The use of educational

technology combined with critical perspectives is suggested as a means to create

conditions for the advancement of equity-oriented practices (Armfield, 2016; Becker,

2016; Gherardi, 2016; Kruger-Ross, 2016; Miller, 2016; Miller, Becker & Becker, 2016).

If equity-oriented practices are the aim, then the positioning of technology in relation to

social powers (as they are enacted in discourses, practices, policies and systems) has

important consequences for technology integration and education writ large. I return to a

call for meaningful dialogue by Miller et al. (2016) regarding the potential of technology in equity-oriented education work:

> As technology continues expanding on a global scale, so too does the influence it has on the lived experiences of individuals. The power of technology to impact the ways in which we relate to each other and to systems of governance and oppression will only increase with time. As a result, this conversation [merging educational technology use and social justice] will become increasingly important in the coming years as society becomes increasingly immersed with types of technology that have the potential to contribute to emancipation but can also perpetuate the dominance of some individuals and groups over others. It is through meaningful dialogue… that we can bring light to the vast potential of the [technology] tools we have to forge a future that empowers even the least advantaged. (p. xvi)

According to Miller et al., casting light on opportunities with technology may impact the construction of a more equitable future. I would also add that these dialogues are a way for educators to lean into tensions for social change. Given that phenomena operate in both pluralistic and competing ways, a professional learning cohort like the one referenced in this study may offer the time, space and support necessary for educators to be present in the entanglements of pursuing more equitable technology integration.

For this reason, I turn attention to the vivid illumination of questioning societal implications. I encountered the phenomenon operating in pluralistic and competing ways. To illustrate, *if I assume (and position/privilege) technology integration (in meaningful, non-rote ways) for social change, am I then unwittingly reifying a classed deficit discourse and perpetuating the notion (and practice of) social mobility in schools?* By extension, *if I privilege a 'modern world' and 'social participation in a global society,' am I then positioning hierarchically particular ways of knowing and being?* (in technology integration beliefs, practices, discourses and societal ways of being). I

wrestled with the possibility of pursuing the integration of technology into elementary classrooms without further privileging and marginalizing of learners. The technology use was both a tool to disrupt the oppressive status quo in classrooms and a tool to reify dehumanizing discourses/practices. The technology use was both a tool to create and express one's thinking, and a learning process that ignores or erases ways of knowing such as sense perception, emotion and faith[36]. As a researcher who was experiencing, producing, provoking and representing the phenomenon, I initially found these entangled tensions alarming. I deeply questioned what, if any, value the pursuit of more equitable technology integration offered equity work in elementary education. After slowing down to feel my feels… to wrestle with them… to tug at them… to be profoundly present with them… I discovered that it was through sitting and playing, interrogating and noticing, and dwelling in the discomfort that I was able to breathe within the entanglement. I did not seek to eliminate it; I did not strive to box it up. I found, for me, being profoundly present in the in-between-ness, I was able to live with and through the entanglement. This intensity called for me to slow down to open up the entanglement of critical perspectives and technology use. Being present in the entanglement of this tension evoked in meaningful dialogues with participants and wobbled (and is still wobbling) my own thinking. Being present in the tensions casts light on opportunities with technology, which may impact the construction of a more equitable future.

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[36] I acknowledge these entangled tensions are represented here as linear and binary constructs. This was not the case for my experience and thinking. However, I have simplified them to a linear/binary representation for clarity so that the emphasis remains with the act of being present in the entanglements and the process of working with and through them.

Plausible possibilities in teacher preparation. Being present also holds potential for the ways which we prepare teachers. One commitment that I hold in my vision for teacher preparation is to try to support the pre-service teacher in the moment instead of constantly measuring if the given teacher is behind in their development. The craft of teaching is not linear, still or staged. The craft of teaching is fluid and entangled. In order to prepare teachers to be present and support their learners in the moment, I suggest making tensions visible and encouraging pre-service teachers to become skeptical of their perceptions. In the era of accountability and standardization discourses in education educators engaged in equity work are destined to encounter tensions in their practice.

One idea for teacher preparation is to provide pre-service teachers with scenarios that illustrate entangled technology uses and equity. Make the tensions visible; be present in them. We can support pre-service teachers in being skeptical of their beliefs, practices, positioning, privileges and power. We can encourage pre-service teachers to enter into the tension within the middle of the entanglement and facilitate them in working through the uncertainties. Through noticing the 'good stuff' being produced and provoked in the entanglement is how we can be profoundly present in our instructional design and facilitation of learning opportunities. It is in how we operate in the in-between-ness, the often tense and uncomfortable messiness of education, that situates us to be responsive for our learning in the moment. We must prepare educators to be responsive to the uncertainties of the classroom including the entangled tensions which operate in the social systems of schools and the ways in which these entanglements may be amplified with the integration of technology. Through having pre-service teachers

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engage with scenarios that illustrate the entangled technology uses and equity, we can demystify the experience of teaching with and through the entanglements of an ever-changing technological world. This practice will provide experience so that when pre-service teachers do encounter entanglements in their own teaching, they have the strategies to be profoundly present and teach towards social change. Being profoundly present [in the entanglements] is never complete, which is the reality of the being and becoming of teaching and learning with technology. Being profoundly present in the pursuit of more equitable technology integration is one way to lean into the tensions for social change.

        [Temper] being and becoming. The conception of [temper] being and becoming is a productive contradiction to the social issue → social opportunity conception to *Be Profoundly Present [in the Entanglements]*. This idea is not enacted as a result of confusion, rather it is an intentional move in support of educators' continuous wobbling within entanglements of pursuing more equitable technology integration. Above, I invited you to be present in the entangled messiness of equity work in technology integration. I have invited you to dwell with it. To play with it. To open it up. To exist in the in-between-ness.

        While there is much to be gained from what is produced and provoked by the lived experience of being and becoming, I also offer a loving (and somewhat forceful) nudge to extend your interrogations into malleable ACTION with a sense of URGENCY. As a scholar, as an educator, and more importantly as a human who cares deeply for humanity, the charge I offer is to [temper] the being and becoming. Temper the

entangled interrogations. Temper the fluidity. Do so just enough to take up the fleeting and transforming threshold without sacrificing the critical gaze. For some, this may perpetuate the discomfort; others may find the movement to be a breath of fresh air. However you experience the tempering, I encourage you to balance being/becoming with action. This process may help one avoid being stuck in an iterative cycle of a profound interrogative presence by taking action.

At no point in my investigation of pursuing more equitable technology integration did the vivid illuminations (findings) suggest an end-point, a concise arrival at having achieved equitable technology integration. Instead, just the opposite occurred; the educators reified the assumptions and interpretations of pursuing more equitable technology integration as a never-ending work in progress. This finding is reflective of the realisty of the digital and social divides, which demand an urgency in attending to the integration of technology usage as an equity issue in a manner which disrupts classroom practice (Wiske, 2004). For this reason, I share practical and actionable elementary classroom applications.

Plausible possibilities in elementary education. Educators' being and becoming can create space for critical reflection and evolution while the tempering of this being and becoming can move one into action. In this way, educators and scholars could synchronously be acting upon the world, acting upon each other and representing social meaning as the pursuit of more equitable technology integration takes shape in different ways with and for learners.

In the subsequent resources with prompts for educators you will see how the abstractness of being and becoming in the entanglements relates to practical and pragmatic resources for technology integration within elementary education. In the construction of this resource I draw upon the ideas of woman scholars who have inspired me - Dr. Libbi Miller and Dr. Stephanie Jones. I have reshaped their scholarly contributions with the goal of sparking productive disruptions in elementary technology integration. Specifically drawing upon works by Miller (2016) and Jones (2006), elementary educators and learners may utilize the following resources to interrogate their use of technologies in education:

- What perspectives, practices and/or people are *centered* in the use of this technology tool?
    - Who do I think this technology tool was made for? Why?
    - Who might feel like an 'insider' when using this technology tool?
- How does the use of this technology tool impact student voice?
    - Can I use this technology tool to share my thinking with my teacher? class? school? neighborhood community? global community?
- What perspectives, practices and/or people are *marginalized* in the use of this technology tool?
    - Who do I think this technology tool was not made for? Why?
    - Who can't use this technology tool? Why?
    - Who might feel like an 'outsider' when using this technology tool?
- How does the use of this technology tool contribute to social participation?
    - Can I use this technology tool to participate in/with/for something I believe in? (e.g. communication/amplify my message, create content, organize/mobilize people, engage in a virtual community)
    - How can I use this tool to connect with members of our class? members of our school? members of our neighborhood community? members of our global community?
- How does the use of this technology tool repeat or challenge bias/stereotypes?
    - Can I use this technology tool to value and validate experiences, identities and perspectives of myself? all members of our class? all members of our school? all members of our neighborhood community? all members of our global community?
    - What types of knowledge are being created or valued with the use of this technology tool?

○ How can I use this technology tool to demonstrate multiple ways of knowing (e.g. Ojibwe ways of knowing: relating, behavior, responsibility, thinking, language, knowing and doing; IBO ways of knowing: language, sense perception, emotion, reason, imagination, faith, intuition and memory)?

I welcome educators and scholars to use these prompts to work as paths to temper being and becoming in the ongoing work of pursuing more equitable technology integration. This resource is crafted in a response to the need for urgent attention to equity issues in technology usage through practical applications. The resource collection of prompts to facilitate technology integration discussions with critical perspectives for elementary educators and learners are by no means all-inclusive or relevant in every context. They are, however, intended to initiate the tempering of being and becoming an educator who pursues more equitable technology integration with a move into action.

Productive speculations. In conclusion, the vivid illuminations (findings), social issue/opportunity conceptions and plausible possibilities are not intended to suggest quick fixes. Rather, they should be considered as proposals which emphasize the continuous need to critically interrogate technology integration with aim to illuminate counter-hegemonic examples of teaching and learning with technology in elementary education thereby producing disruptions in the status quo towards more equitable practices. A single author or research study cannot address all of the issues surrounding the massive undertaking of transforming technology integration on both school and societal levels. Likewise, it is not possible to construct a fixed understanding with phenomenon that are always in flux, multiple and fleeting. This research should be taken as a glimpse into

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how the pursuit of more equitable technology integration took shape for my participants

and me captured in a particular moment in time.

Yet, as guardians of humanity, the collective we must amplify our investments in

humanizing technology integration if we are to truly pursue more equitable social

opportunities for ALL of our learners and society writ large. In this dissertation I

employed phenomenology to explore technology use in elementary education which is

situated as simultaneously a social issue and a social opportunity. Van Manen suggests

> Phenomenology aims at gaining a deeper understanding of the nature or meaning of our everyday experiences… [it] does not offer us the possibility of effective theory with which we can now explain and/or control the world, but rather ***it offers us the possibility of plausible insights*** that bring us in more direct contact with the world. (van Manen, 2001, p. 9, emphasis added)

unOthering, questioning societal implications and achieving homeostasis were offered as

vivid illuminations of the phenomenon pursuing more equitable technology integration.

Opportunities dwell not within the technology tools themselves, but rather in the

relationships among people, social systems and usage of these tools to represent and

produce ways of knowing and being. As a collective we can 1) wobble [within the

ecosystem] beginning with individual educators' technology beliefs and practices; 2) be

profoundly present [in the entanglements]; and 3) [temper] being and becoming as ways

in which we might climb out of the primordial ooze (of binaries, histories, discourses,

beliefs, practices, pedagogies, hierarchical ways of being/knowing, Othering, and the

status quo in teaching and learning). These strategies include celebrating our social in-

between-ness and, against all odds, evolving as each other's keepers.

Through my experience being entangled in the phenomenon (and the research of it) I remind myself that phenomenology is "a way of being, becoming, living, and moving through the world" (Vagle, 2018, p. xii). As a scholar, an educator and a human (who is 'type A', who craves for things to be concrete sequential and color-coded organized in rainbow order) post-intentional phenomenology has been a site of ongoing internal tension. I recognize, however, "... *phenomenology is a craft*. It involves an embodied relation with the world and all things in it - and it is a creative act that cannot be mapped out in a once-and-for-all sort of way" (Vagle, 2018, p. xii, emphasis in original). Despite my struggles, I sought to take up this craft in the investigation of how the phenomenon was at work in the craft of teaching in order to be, become, live and move as a thinking, dreaming, feeling and loving human being.

Incidentally, I close with turning myself over to the craft and my own experience of what was provoked by pursuing more equitable technology integration. I share a creative act - a craft that is practiced in divergent, abstract and unconventional ways (Vagle, 2018) - to see what comes of it. I was drawn to work inspired by Red Burns (Appendix M) and felt called to craft my own interpretation[37] of it in relation to my phenomenon. With this poem, I return to my invitation for you, as the reader, to begin noting your relations with this phenomenon, the ways in which this experience has

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[37] In post-intentional phenomenology "The 30K and 10K assumptions of the phenomenon taking shape and being produced and provoked means that you can organize the text by the shape you want to communicate. Which might look a bit more irregular, and a bit less neat and clean" (Vagle, 2018, p. 160). Thus, I have tinkered and am communicating the phenomenon taking shape in this modified poem excerpt. While I am by no means a poet, the crafting as my analytic thinking took shape in response to the phenomenon as my way of inspiring ongoing being and becoming, thinking and dreaming, teaching and learning, living and moving through the world as a loving guardian of humanity.

become an extension of oneself, perhaps triggering further embodied and transformative representations of pursuing more equitable technology integration. My wish is that you encounter no ways of seeing as out of bounds, and you take up this work as a means for social change in being each other's keepers. As guardians of humanity in a world that can, at times, be Othering, uses of technology hold opportunities to be more fully human. I invite and encourage you to engage in the pursuit of more equitable technology integration as one way to evolve and enact a more just future.

We are the Guardians of Humanity in Technology Integration

The excerpt *"We are the Guardians of Humanity Through Technology Integration"* is represented in Figure 9-1. This excerpt is also available in larger form in Appendix N.

Figure 9-3. We are the guardians of humanity through technology integration.

What I hope for you is...

That you are *profoundly present* in an edgy mixture of **CRITICAL GAZE** and action. That you think of *technology as a verb* - not a noun - as an extension of yourself to engage with and improve the world. That you see social issues as social opportunities to be conscientious and wobble. That you are being and becoming more equitable technology integrationists in ways that leave a mark on *your heart*. That you remember most social issues can be productively addressed with attention to assumptions, intensities and problematizing social systems and practices at work. That you see differently. That you create opportunities to productively speculate. That you feel the in-between-ness of social change. That you observe, imagine and create in the *entanglements* of using technology as a means of unOthering. That you lean into tensions. That you PRODUCTIVELY DISRUPT beliefs, practices and systems which marginalize learners. That you trust your ways of knowing and being. That you feed your curiosity with technology as permeable and malleable in their *relationship with humans*. That you look for the inequities in education - acknowledging the digital divides as persistent and pervasive - but not inevitable. That you are not seduced by power and privilege. That you don't see technology integration beliefs, practices, pedagogies and professional learning as a static. That you leverage the affordances of technology to participate in a global community. That you are driven by people, not hardware. That you are willing to *use technology* to produce disruptions in the STATUS QUO OF EDUCATION towards more equitable practices. That you slow down to REMAIN OPEN. That you construct and embody pluralistic ways of being an educator. That you play. That you create, connect, communicate and collaborate with technology. That you act with a sense of urgency in your classroom. That you strive to achieve technology use homeostasis in your ecosystem. That then, as each other's keepers, you wobble the ecosystem with further *questioning of societal implications*. That you LOVE your learners well. That you are the guardian of humanity through uses of technology in your classroom community. That you take up the pursuit of more equitable technology integration.

Written by: Tiffany Nielsen-Winkelman
Inspired by:
Red Burns,
the phenomenon of pursuing more equitable technology integration
and the wonderful elementary educators who participated in this research

References

Abbott, J., & Faris, S. (2000). Integrating technology into pre-service literacy instruction: A survey of elementary education students' attitudes toward computers. *Journal of Research on Computing in Education, 33*, 149-182.

Adams, C. (2007). On the "Informed Use" of PowerPoint rejoining Vallance and Towndrow. *Journal of Curriculum Studies, 39*(2), 229-232.

Ahmed, S. (2012). *On being included: Racism and diversity in institutional life*. Durham, NC: Duke University Press.

Alsop, A. (2000). *Continuing professional development: A guide for therapists.* Oxford, UK: Blackwell Science.

Atler, C. (2018, March 22). The school shooting generation has had enough. *Time*. Retrieved from: http://time.com/longform/never-again-movement/

American Academy of Pediatrics. (2011a, June 13). Council on Communications and Media letter to the National Association for the Education of Young Children.

American Academy of Pediatrics. (2011b). Policy statement: Media use by children younger than 2 years. *Pediatrics, 128*(5), 1–7.

American Academy of Pediatrics. (2016). Media use in school-aged children and Adolescents. *Pediatrics, 138*(5).

American Presidency Project. (1996, January 23). Address Before a Joint Session of the Congress on the State of the Union. Retrieved from: http://www.presidency.ucsb.edu/ws/?pid=53091

Anderson, M. (2017, March 22). Digital divide persists even as lower-income Americans make gains in tech adoption. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2017/03/22/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/

Anderson, R. E., & Becker, H. J. (2001). *Teaching, learning, and computing* (Report No. 8). Irvine, CA: Center for Research on Information Technology and Organizations.

Anderson, R. E., & Ronnkvist, A. (1999). *Teaching, learning, and computing* (1998 National Survey No. 8). Irvine, CA: Center for Research on Information Technology and Organizations.

Andreotti, V. (2009). Global education in the '21st century': Two different perspectives on the 'post-' of postmodernism. *International Journal of Development Education and Global Learning, 2*(2), 5-22.

Angeli, C., & Valanides, N. (2009). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: Advances in technological pedagogical content knowledge (TPCK). *Computers & Education*, *52*(1), 154-168.

Appel, A.E., & C. O'Gara. (2001). Technology and young children: A review of literature. *TechKnowLogia, 3*(5): 35-36. Retrieved from: http://ict.aed.org/infocenter/pdfs/technologyandyoung.pdf

Araque, J. C., Maiden, R. P., Bravo, N., Estrada, I., Evans, R., Hubchik, K., ... & Reddy,

M. (2013). Computer usage and access in low-income urban communities. *Computers in Human Behavior, 29*(4), 1393-1401.

Armfield, S. W. J. (2016). Questioning technology integration. In Miller, Becker & Becker. (Eds.), *Technology for transformation: Perspectives of hope in the digital age*. (107-122). Charlotte, NC: Information Age Publishing.

Attewell, P. (2001). Comment: The first and second digital divides. *Sociology of education, 74*(3), 252-259.

Barron, A. E., Kemker, K., Harmes, C., & Kalaydjian, K. (2003). Large-Scale research study on technology in K-12 school: Technology integration as it relates to the national technology standards. *Journal of Research on Technology in Education, 35*(4), 489-508.

Barzilai-Nahon, K. (2006). Gaps and bits: Conceptualizing measurements for digital divide/s. *The Information Society, 22*(5), 269-278.

Battiste, M. (2004). Bringing Aboriginal education into the contemporary education: Narratives of cognitive imperialism reconciling with decolonization. In J.Collard & C. Reynolds (Eds.), *Leadership, Gender and Culture. Male and female perspectives*, 142-148. Maidenhead, UK: Open University Press.

Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of Technology and Teacher Education, 13*(4), 519.

Bauer, W. I., Reese, S., & McAllister, P. A. (2003). Transforming music teaching via technology: The role of professional development. *Journal of Research in Music Education*, 51(4), 289-301.

Bebell, D., Russell, M., & O'Dwyer, L. (2004). Measuring teachers' technology uses: Why multiple-measures are more revealing. *Journal of Research on Technology in Education, 37*(1), 45-63.

Becker, H. J. (1983). School uses of microcomputers: Report #1 from a national survey. *Journal of Computers in Mathematics and Science Teaching, 3*(2), 29-33.

Becker, H. J. (1984). Computers in schools today: Some basic considerations. *American Journal of Education, 93*(1), 22-39.

Becker, H. J. (1994). *Analysis and trends of school use of new information technologies*. Irvine, CA: University of California, Irvine. Department of Education.

Becker, H. J. (2000a). Findings from the teaching, learning and computing survey: Is Larry Cuban right? *Education Policy Analysis Archives*. Retrieved from: http://epaa.asu.edu/epaa/v8n51/

Becker, H. J. (2000b). Pedagogical motivations for student computer use that lead to student engagement. *Educational Technology, 40*(5), 5-17.

Becker, H.J. (2000c). Who's wired and who's not: Children's access to and use of computer technology. *Future of Children, 10*(2), 44-75. Los Altos, CA: The David and Lucile Packard Foundation. Retrieved charts from: http://www.gse.uci.edu/doehome/DeptInfo/Faculty/Becker/packard/saveall.html#top.

Becker, D.H. (2016). Creating citizens capable of advancing democratic deliberation in a

networked world. In Miller, Becker & Becker. (Eds.), *Technology for transformation: Perspectives of hope in the digital age*. (33-52). Charlotte, NC: Information Age Publishing.

Becker, H. J., & Ravitz, J. (1999). The influence of computer and internet use on teachers' pedagogical practices and perceptions. *Journal of Research on Computing in Education, 31*(4), 356-385.

Becker, H., & Reil, M. (1999). Teacher and teacher-directed student use of computers and software. Irvine, CA: Center for Research on Information Technology and Organizations, University of California. Bødker, S. (1991). *Through the interface: A human activity approach to user interface design*, 7-11.

Beckett, D., & Hager, P. J. (2002). *Life, work, and learning: Practice in postmodernity*. New York, NY: Routledge.

Beijaard, D., Meijer, P., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education, 20*(2), 107-128.

Bell, L. A. (1997). Theoretical foundations for social justice education. In Bell & Adams. (Eds.), *Teaching for diversity and social justice* (3-15). New York, NY: Routledge.

Belland, B. (2009). Using the theory of habitus to move beyond the study of barriers to technology integration. *Computers & Education, 52*(2), 353-364.

Benson, T. K. (2012). *A post-intentional phenomenological case study of pedagogical awareness of technology integration into secondary science teaching (Doctoral dissertation)*. University of Minnesota, Minneapolis, MN.

Bishop, R. S. (1990). Mirrors, windows, and sliding glass doors. *Perspectives*, 6(3), ix-xi.

Blikstein, P. (2008). Travels in Troy with Freire: Technology as an agent of emancipation. *Educação e Pesquisa, 42*(3), 837-856. English version (2016) retrieved from: https://tltl.stanford.edu/sites/default/files/files/documents/publications/2008.Book -B.Travels.pdf

Bloom, B. S. (1969). *Taxonomy of educational objectives: The classification of educational goals: by a Committee of College and University Examiners: Handbook 1*. David McKay.

Bomer, R., & Bomer, K. (2001). *For a better world: Reading and writing for social action*. Portsmouth, NH: Heinemann.

Bradbrook, G., & Fisher, J. (2004). Digital Equality: Reviewing digital inclusion activity and mapping the way forwards. *Citizens online*.

Brickner, D. (1995). The effects of first and second order barriers to change on the degree and nature of usage of secondary mathematics teachers: A case study. (Unpublished doctoral dissertation). Purdue University, West Lafayette, IN.

Brooks-Gunn, J., & E.H. Donahue. (2008). Introducing the Issue. *The Future of Children, 18*(1), 3-10. Retrieved from: www.princeton.edu/futureofchildren/publications/docs/18_01_01.pdf

Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of

information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using Information and Communication Technology*, *8*(1), 136.

Caena, F. (2011). Literature review: Quality in teachers' continuing professional development. *Education and Training 2020*, 2-20.

Caldwell, M., & Frame, O. (2017). *Let's Get Real: Exploring Race, Class, and Gender Identities in the Classroom*. New York, NY: Routledge.

Campaign for a Commercial-Free Childhood. (2010, June). [Website]. Retrieved from: https://commercialfreechildhood.org/newsletter/june-2010

Carbado, D. W., Crenshaw, K. W., Mays, V. M., & Tomlinson, B. (2013). Intersectionality. *Du Bois review: social science research on race*, *10*(02), 303-312.

Carlisle, L. R., Jackson, B. W., & George, A. (2006). Principles of social justice education: The social justice education in schools project. *Equity & Excellence in Education*, *39*(1), 55-64.

Cassidy, M. (1998). Historical perspectives on teaching with technology in K-12 schools. *Atlantic Journal of Communication*, *6*(2), 170-184.

Cerbone, D. R. (2008). *Heidegger: A guide for the perplexed*. New York, NY: Continuum International Publishing Group.

Chan, K., & Elliott, R. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education*, *20*(8), 817-831.

Chapman, G. (2000). Federal support for technology in K-12 education. *Brookings Papers on Education Policy, 2000*(1), 307-354.

Chenoweth, E. & Pressman, J. (2018). March for our lives. Crowd Counting Consortium. [Website, Data file]. Retrieved from: https://sites.google.com/view/crowdcountingconsortium/view-download-the-data?authuser=0

Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of Women in Culture and Society*, *38*(4), 785-810.

Chouliaraki, L., & Fairclough, N. (1999). *Discourse in late modernity: Rethinking critical discourse analysis*. Edinburgh, UK: Edinburgh University Press.

Christakis D., Zimmerman F., DiGiuseppe D., & McCarty C. (2004). Early television exposure and subsequent attentional problems in children. *Pediatrics, 113*, 708-713.

Christensen, R. (2002). Effects of technology integration education on the attitudes of teachers and students. *Journal of Research on Technology Education, 34*(4), 411-434.

Christensen, C., Horn, M., & Johnson, C. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. New York, NY: McGraw-Hill.

Clark, R., & Estes, F. (2008). *Turning research into results*. Charlotte, NC: Information Age Publishing, Inc.

Cochran-Smith, M., & Lytle, S. L. (2001). Beyond certainty: Taking an inquiry stance on

practice. In Lieberman, A., & Miller, L. (Eds.), *Teachers caught in the action: Professional development that matters*, 45-58. New York, NY: Teachers College Press.

Coldron, J., & Smith, R. (1999). Active location in teachers' construction of their professional identities. *Journal of Curriculum Studies*, *31*(6), 711-726.

Coleman, D., Battiste, M., Henderson, S., Findlay, I. M., & Findlay, L. (2012). Different knowings and the Indigenous humanities. *ESC: English Studies in Canada*, *38*(1), 141-159.

Committee for Economic Development. (2004). Developmental Education: The value of high quality preschool investments as economic tools. Retrieved from: http://www.ced.org/docs/report/report_preschool_2004_developmental.pdf

Common Core State Standards Initiative (2018). *Preparing America's students for success* [Website.]. Retrieved from: http://www.corestandards.org/

Common Sense Media. (2008). *Media + child and adolescent health: A systematic review*. San Francisco: Author. Retrieved from: http://ipsdweb.ipsd.org/uploads/IPPC/CSM%20Media%20Health%20Report.pdf

Common Sense Media. (2011). *Zero to eight: Children's media use in America*. San Francisco: Author. Retrieved from: www.commonsensemedia.org/research/zero-eight-childrens-media-use-america

Cordes, C., & E. Miller, eds. (2000). *Fool's gold: A critical look at computers in childhood*. College Park, MD: Alliance for Childhood. Retrieved from: http://drupal6.allianceforchildhood.org/fools_gold

Corn, R. (Director) & Clack, Z. (Writer). (2008, April 24). Where the wild things are [Television series episode]. In S. Rhimes (Executive producer). *Grey's anatomy* (Season 4, episode 12). New York: NY: ABC.

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, 1241-1299.

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* New York, NY: Pearson.

Crichton, S. E., & Carter, D. (2015). Taking making into the schools: An immersive professional. *Handbook of Research on Teacher Education in the Digital Age*, 412-439.

Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. New York: NY: Teachers College Press.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom 1980-2000*. Cambridge, MA: Harvard University Press.

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal, 38*(4), 813-834.

Culatta, R. (2015). Office of the Secretary, U.S Department of Education. [Letter to colleagues]. Examples of Leveraging ESEA and IDEA Funds for Digital Teaching and Learning.

Dahlberg, K. (2006). The essence of essences–the search for meaning structures in

phenomenological analysis of lifeworld phenomena. *International Journal of Qualitative Studies on Health and Well-being*, *1*(1), 11-19.

Dahlberg, K., Dahlberg, H., & Nystrom, M. (2008). *Reflective lifeworld research*. (2nd Ed.). Lund, Sweden: Studentlitteratur.

Darling-Hammond, L., Wei, R., Andree, A., Richardson, N., & Orphanos, S. (2009). Professional learning in the learning profession: A status report on teacher development in the United Stated and abroad. National Staff Development Council. Retrieved from: http://www.nsdc.org/news/NSDCstudy2009.pdf.

Darling-Hammond, L., Zielezinski, M. B., & Goldman, S. (2014). Using technology to support at-risk students' learning. *Stanford Center for Opportunity Policy in Education*. Retrieved from: https://edpolicy.stanford.edu/sites/default/files/scope-pub-using-technology-report.pdf

Davis, M. A., & Eslinger, D. (2001). Acquisition of computer skills and practices by K-8 classroom teachers. *Contemporary Education*, *72*(2), 5.

Day, C. (1999). *Developing teachers: The challenges of lifelong learning*. Educational Change and Development Series. Philadelphia, PA: Falmer Press.

Day, C., Kington, A., Stobart, G., & Sammons, P. (2006). The personal and professional selves of teachers: Stable and unstable identities. *British Educational Research Journal*, *32*(4), 601-616.

Deleuze, G., & Guattari, F. (1987). *A thousand plateaus, capitalism and schizophrenia*. Minneapolis, MN: The University of Minnesota Press.

Derman-Sparks, L. (2016, April 14). *Guide for selecting anti-bias children's books*. Teaching for change: Building social justice starting in the classroom. [Website]. Retrieved from: http://www.teachingforchange.org/selecting-anti-bias-books

de Sousa Santos, B. (Ed.). (2007). *Cognitive justice in a global world: Prudent knowledges for a decent life*. Lanham, MD: Lexington Books.

DiMaggio, P., & Hargittai, E. (2001). *From the "digital divide" to "digital inequality": Studying Internet use as penetration increases*. Princeton, NJ: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University. Retrieved from: http://www.princeton.edu/~artspol/workpap/WP15%20-%20DiMaggio%2BHargittai.pdf

DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). From unequal access to differentiated use: A literature review and agenda for research on digital inequality. *Social Inequality*, 355-400.

Duran, M., Brunvand, S., Ellsworth, J., & Şendağ, S. (2011). Impact of research-based professional development: Investigation of in-service teacher learning and practice in wiki integration. *Journal of Research on Technology in Education*, *44*(4), 313-334.

EA, Prince. [Username]. (2016, September 26). *I just sued the school system*. [Video file]. Retrieved from: https://youtu.be/dqTTojTija8

Earle, R. S. (2002). The integration of instructional technology into public education: Promises and challenges. *Educational Technology*, *42*(1), 5-13.

Elliotzetta. [Username]. (2016, August 28). *Decolonizing the imagination of Black children*. [Video file]. Retrieved from: https://youtu.be/h1kNC473vTU

Equity for Children. (2013, June). Equity and social justice: A short introduction [Document]. Retrieved from: http://www.equityforchildren.org/wp-content/uploads/2013/07/FinalPaper-EquityandSocialJustice-AnIntroduction-1.pdf

Ertmer, P. (1999). Addressing first-and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development, 47*(4), 47-61.

Ertmer, P. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration?. *Educational Technology Research and Development, 53*(4), 25-39.

Ertmer, P., Addison, P., Lane, M., Ross, E., & Woods, D. (1999). Examining Teachers' Beliefs about the Role of Technology in the Elementary Classroom. *Journal of Research on Computing in Education, 32*(1), 54-72.

Ertmer, P., & Ottenbreit-Leftwich, A. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42*(3), 255-284.

Ertmer, P., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. *Computers & Education, 64*, 175-182.

Ertmer, P., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59*(2), 423-435.

Fairclough, N. (1992). *Discourse and social change*. Cambridge, MA: Polity Press.

Fecho, B., Graham, P. & Hudson-Ross, S. (2005). Appreciating the wobble: teacher research, professional development, and figured worlds. *English Education, 37*(3), 174-199.

Federal Communication Commission. (1999). E-Rate program Retrieved from: http://www.fcc.gov/ learnnet/welcome.html

FitzPatrick, S. B. (2001). *An exploratory study of the implementation of an educational technology in two eighth grade mathematics classes*. Unpublished Dissertation, Pennsylvania State University, Philadelphia.

Fleming, L. (2015). *Worlds of making: Best practices for establishing a makerspace for your school*. Thousand Oaks, CA: Corwin Press.

Foucault, M. (2010/1977a). Truth and power. In P. Rabinow (Ed.), *The Foucault Reader* (pp. 51-76). New York, NY: Radom House. (Reprinted from *Power/Knowledge*, 1977).

Franklin, C., & Bolick, C. (2007). Technology Integration: A Review of the Literature. *Online Submission*.

Freire, P. (1970/2000). *Pedagogy of the oppressed*. New York, NY: Continuum International Publishing Group.

Ganser, T. (2000). An ambitious vision of professional development for teachers. *NASSP Bulletin, 84*(618), 6-12.

Garet, M.S., Porter, A.C., Desimone, L., Birman, B.F., & Yoon, K.S., (2001). What

makes professional development effective? Results from a national sample of teacher. *American Educational Research Journal, 38*(4), 915-945.

Gee, J.P. (2011). Discourse analysis: What makes it critical? In Rogers, R. (Ed.), *An introduction to critical discourse analysis in education (2ⁿᵈ ed.)*, 23-45. New York, NY: Routledge.

Gee, J. P. (2014). *An introduction to discourse analysis: Theory and method*. New York, NY: Routledge.

George, Y., Neale, D., Van Horne, V., & Malcom, S. (2001). *In Pursuit of a Diverse Science, Technology, Engineering, and Mathematics Workforce: Recommended Priorities for Enhanced Participation by Underrepresented Minorities*. Washington, DC: American Association for the Advancement of Science. Retrieved from: http://www.nsfagep.org/files/2010/03/AGEP_report.pdf

Gherardi, S. (2016). Social divides, digital bridges: Exploring the potential of technology in inclusive education. In Miller, Becker & Becker. (Eds.), *Technology for transformation: Perspectives of hope in the digital age*. (175-194). Charlotte, NC: Information Age Publishing.

Giroux, H. A. (2003). Public pedagogy and the politics of resistance: Notes on a critical theory of educational struggle. *Educational Philosophy and Theory*, *35*(1), 5-16.

Glatthorn, A. (1995). Teacher development. *International encyclopedia of teaching and teacher education*, *2*.

Goddard, M. (2002). What do we do with these computers? Reflections on technology in the classroom. *Journal of Research on Technology in Education*, *35*(1), 19-26.

Goddard, M. (2002). What do we do with these computers? Reflections on technology in the classroom. *Journal of Research on Technology in Education, 35*(1), 19-26.

Golding, P. (2002). Forthcoming Features: Information and Communications and the Sociology of the Future. *Sociology, 34*(1): 165–84.

Gonzalez, E. (2018, March 23). Dear lawmakers, you're killing us. *Teen Vogue*. Retrieved from: https://www.teenvogue.com/contributor/emma-gonzalez

Grant, C. A., & Gillette, M. (2006). A candid talk to teacher educators about effectively preparing teachers who can teach everyone's children. *Journal of Teacher Education*, *57*(3), 292-299.

Greisman, H. C., & Ritzer, G. (1981). Max Weber, critical theory, and the administered world. *Qualitative Sociology*, *4*(1), 34-55.

Gross, L. W. (2016). *Anishinaabe ways of knowing and being*. Farnham, UK: Ashgate Publishing Limited.

Grove, K., Strudler, N., & Odell, S. (2004). Mentoring toward technology use: Cooperating teachers practice in supporting student teachers. *Journal of Research on Technology in Education*, *27*(1), 85-110.

Guha, S. (2001). Integrating computers in elementary grade classroom instruction – Analyses of teachers' perceptions in present and preferred situations. *Journal of Educational Computing Research*, *24*(3), 275-303.

Hackman, H. W. (2005). Five essential components for social justice education. *Equity & Excellence in Education*, *38*(2), 103-109.

Hart, M. (1990). Critical theory and beyond: Further perspectives on emancipatory

education. *Adult Education Quarterly*, *40*(3), 125-138.

Hart, H., Allensworth, E., Lauen, D., & Gladden, R. (2002). Educational technology: Its availability and use in Chicago's public schools. Chicago: Consortium on Chicago school research.

Hatch, M. (2014). *The maker movement manifesto: rules for innovation in the new world of crafters, hackers, and tinkerers*. New York, NY: McGraw-Hill Education.

Hargittai, E. (2004). Internet access and use in context. *New Media & Society*, *6*(1), 137-143.

Hargittai, E., & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the Internet. *Communication Research*, *35*(5), 602-621.

Hannafin, R. & Savenye, W. (1993). Technology in the classroom: The teacher's new role and resistance to it. *Educational Technology*, *33*(6), 26-31.

Hazzan, O. (2003). Prospective high school mathematics teachers' attitudes toward integrating computers in their future teaching. *Journal of Research on Computing in Education*, *35*(2), 213-225.

Healy, S. (2003). Epistemological pluralism and the 'politics of choice'. *Futures*, *35*(7), 689-701.

Heidegger, M. (1998). Phenomenology and theology. *The Piety of Thinking*, 5-21.

Hernandez, M. (2015, September 16). Empowering students through multimedia storytelling. *Edutopia*. Retrieved from: https://www.edutopia.org/blog/empowering-students-through-multimedia-storytelling-michael-hernandez

Hew, K., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, *55*(3), 223-252.

Hlynka, D. (2004). Postmodernism in educational technology: update: 1996-present. *Handbook of Research for Educational Communications and Technology*, *2,* 243-246.

Hofer, B. (2001). Personal epistemology research: Implications for learning and teaching. *Educational Psychology Review*, *13*(4), 353-383.

Hoffman, D. L., Novak, T. P., & Schlosser, A. E. (2001). The evolution of the digital divide: Examining the relationship of race to Internet access and usage over time. In Compaine, B. M. (Ed.), *The digital divide: Facing a crisis or creating a myth*, 47-97. Cambridge, MA: MIT Press.

Hofsess, B. A. (2013). *Embodied intensities: Artist-teacher renewal in the swell and afterglow of aesthetic experiential play* (Doctoral dissertation). University of Georgia, Athens, Georgia.

Hokanson, B., & Hooper, S. (2004). Integrating technology in classrooms: We have met the enemy and he is us. *Association for Educational Communications and Technology*. Retrieved from: https://files.eric.ed.gov/fulltext/ED485143.pdf

Holland, D. C., Lachicotte, W., Skinner, D., & Cain, C. (2001). *Identity and agency in*

cultural worlds. Cambridge, MA: Harvard University Press.

Hooks, B. (1994). *Outlaw culture: Resisting representations*. New York, NY: Routledge.

Horkheimer, M. (1972). *Critical theory: Selected essays* (Vol. 1). New York, NY: Continuum Publishing Company.

Horrigan, J. (2015, April 15). The numbers behind the broadband 'homework gap'. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2015/04/20/the-numbers-behind-the-broadband-homework-gap/

Horrigan, J. (2016, September 20). Digital readiness gaps. *PEW Research Center*. Retrieved from: http://www.pewinternet.org/2016/09/20/digital-readiness-gaps/

Huand, H., & Liaw, S. (20005). Exploring users' attitudes and intensions toward the wen as a survey tool. *Computers in Human Behavior, 12(5)*, 729-743.

Hughes-Decatur, H. (2011). Educational literacy: Learning to first acknowledge and then read the body in education. *English Teaching*, 10(3), 72.

Husserl, E. (1970) *The crisis of European science and transcendental phenomenology: An introduction to phenomenological philosophy*. Northwesten University Press.

Hytten, K., & Bettz, S.C. (2011). Understanding education for social justice. *The Journal of Educational Foundations*, 25(1/2). 7.

Ihde, D. (1979). *Technics and praxis*. Boston, MA: Reidel Publishing.

Ihde, D. (2003). Postphenomenology – again? Working papers from Centre for STS Studies. Retrieved from http://sts.imv.au.dk/search/search_files_directories/Ihde.

Inan, F., & Lowther, D. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development*, *58*(2), 137-154.

International Baccalaureate Organization. (2018). *About the IB*. Retrieved from: http://www.ibo.org/about-the-ib/

International Society for Technology in Education. (2018). ISTE standards. Washington, DC: Author. Retrieved from: https://www.iste.org/standards

Jackson, A. & Mazzei, L. (2012). *Thinking with theory in qualitative research*. New York, N.Y.: Routledge.

Jackson, A. & Mazzei, L. (2013). Plugging one text into another: Thinking with theory in qualitative research. *Qualitative Inquiry*, *19*(4), 261-271.

Jarvis, P. (2004). *Adult education and lifelong learning: Theory and practice* (3rd ed.). Abingdon, UK: RoutledgeFalmer.

Jenkins, J., Ito, M. & Boyd, D. (2016). *Participatory culture in a networked Era*. Cambridge, MA: Polity Press.

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. J. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: MIT Press.

Johns Hopkins University. Center for Social Organization of Schools, & Becker, H. J. (1983). *School uses of microcomputers: Reports from a national survey*. Center for Social Organization of Schools, The Johns Hopkins University.

Jonassen, D. (1996). *Computers in the classroom: Mindtools for critical thinking*. Prentice-Hall, Inc.

Jones, S. (2006). *Girls, social class, and literacy: What teachers can do to make a*

difference. Portsmouth, NH: Heinemann Educational Books.

Judson, E. (2006). How teachers integrate technology and their beliefs about learning: Is there a connection? *Journal of Technology and Teacher Education*, *14*(3), 581-597.

Kafai, Y. B., & Burke, Q. (2014). *Connected code: Why children need to learn programming*. Cambridge, MA: MIT Press.

Kahn, R., & Kellner, D. (2007). Paulo Freire and Ivan Illich: Technology, politics and the reconstruction of education. *Policy futures in education, 5*(4), 431-448.

Kanaya, T., Light, D., & Culp, J. (2005). Factors influencing outcomes from a technology-focused professional development program. *Journal of Research on Technology in Education*, *37*(3), 313-329.

Kay, R. H. (2006). Evaluating strategies used to incorporate technology into preservice education: A review of the literature. *Journal of Research on Technology in Education*, *38*(4), 383-408.

Kay, K., & Honey, M. (2005). Beyond technology competency: A vision of ICT literacy to prepare students for the 21st century. *The Institute for the Advancement of Emerging Technologies in Education.* Charleston, WV: Evantia.

Keengwe, J., & Onchwari, G. (2009). Technology and early childhood education: a technology integration professional development model for practicing teachers. *Early Childhood Education Journal, 37*(3), 209–218.

Keengwe, J., Onchwari, G., & Wachira, P. (2008). Computer technology integration and student learning: Barriers and promise. *Journal of Science Education and Technology*, *17*(6), 560-565.

Kent, T. (2007, October 7). Male elementary teachers growing scarce despite concerns. *The Free Press*. Retrieved from: https://www.mnsu.edu/news/read/?id=old-1191854085&paper=topstories

Khalifa, M. (2018, March, 29). *Debating teacher education: Critical foundations and the future of teacher education* (speech). University of Minnesota, Minneapolis, MN.

Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, *29*, 76-85.

Kincheloe, J.L. (2007). Critical pedagogy in the twenty-first century: Education for survival. In McLaren, P. & Kincheloe, J.L. (Eds.), *Critical pedagogy: Where are we now?,* 9-42. New York, NY: Peter Lang.

Kincheloe, J. L., & McLaren, P. (2002). Rethinking critical theory and qualitative research. *Ethnography and schools: Qualitative approaches to the study of education*, 87-138.

Kissinger, K. (2017). *Anti-bias education in the early childhood classroom: Hand in hand, Step by Step*. New York, NY: Routledge.

Kleiner, A., & Lewis, L. (2003). *Internet access in U.S. public schools and classrooms: 1994-2002*. (NCES 2004-011). U.S. Department of Education. Washington, D.C.: National Center for Education Statistics.

Korupp, S., & Szydlik, M. (2005). Causes and trends of the digital divide. *European Sociological Review*, *21*(4), 409-422.

Kruger-Ross, M. (2016). Approaching the ground of our assumptions about educational

technologies. In Miller, Becker & Becker. (Eds.), *Technology for transformation: Perspectives of hope in the digital age*. (3-18). Charlotte, NC: Information Age Publishing.

Kumashiro, K. (2002). *Troubling Education*. New York, NY: Routledge Farmer.

Ladson-Billings, G. (2008). Yes, but how do we do it?": Practicing culturally relevant pedagogy. In Ayers, W., Ladson-Billings, G., Michie, G., & Noguera, P. (Eds), *City kids, city schools: More reports from the front row*, 162-177. New York, NY: The New Press.

Lather, P. (1993). Fertile obsession: Validity after poststructuralism. *The Sociological Quarterly*, *34*(4), 673-693.

Lawless, K., & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, *77*(4), 575-614.

Lee, S.-J., Bartolic, S., & Vandewater, E.A. (2009). Predicting Children's Media Use in the USA: Differences in Cross-Sectional and Longitudinal Analysis. *British Journal of Developmental Psychology, 27*(1), 123-43.

Lee, K., & Vagle, M. (Eds.). (2010). *Developmentalism in early childhood and middle grades education: Critical conversations on readiness and responsiveness*. New York, NY: Springer.

Leonard, L. J., & Leonard, P. E. (2006). Leadership for technology integration: Computing the reality. *The Alberta Journal of Educational Research, 52*(4), 212-224.

Leonardi, P. M. (2003). Problematizing" new media": Culturally based perceptions of cell phones, computers, and the Internet among United States Latinos. *Critical Studies in Media Communication*, *20*(2), 160-179.

Leonardo, Z. (2004). Critical social theory and transformative knowledge: The functions of criticism in quality education. *Educational Researcher*, *33*(6), 11-18.

Liao, Y. C., Ottenbreit-Leftwich, A., Karlin, M., Glazewski, K., & Brush, T. (2017). Supporting change in teacher practice: Examining shifts of teachers' professional development preferences and needs for technology integration. *Contemporary Issues in Technology and Teacher Education*, *17*(4), 522-548.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry (Vol. 75)*. Newbury Park, CA: Sage Publications.

Linderoth, J. (2013, October 17). Open letter to Dr. Ruban Puentedura [Blog Post]. Retrieved from: http://spelvetenskap.blogspot.com/2013/10/open-letter-to-dr-ruben-puentedura.html

Livingston, K., & Condie, R. (2006). The impact of an online learning program on teaching and learning strategies. *Theory into Practice*, *45*(2), 150-158.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New Media & Society*, *9*(4), 671-696.

Lowther, D. L., Inan, F. A., Strahl, J. D., & Ross, S. M. (2012). Do one-to-one initiatives bridge the way to 21st century knowledge and skills?. *Journal of Educational Computing Research*, *46*(1), 1-30.

Marcinkiewicz, H. R. (1994). Computers and teachers: factors influencing computer use

in the classroom. *Journal of Research on Computing in Education, 26*(2), 220-237.

Martinez, S. L., & Stager, G. (2013). *Invent to learn: Making, tinkering, and engineering in the classroom*. Torrance, CA: Constructing Modern Knowledge Press.

Marx, R. W., Blumenfeld, P. C., Krajcik, J. S., Fishman, B., Soloway, E., Geier, R., & Tal, R. T. (2004). Inquiry-based science in the middle grades: Assessment of learning in urban systemic reform. *Journal of Research in Science Teaching, 41*(10), 1063-1080.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370-396.

Mantsios, G. (2004). Media Magic. In Rothenberg, P.S. (Eds.), *Race, class and gender in the United States: An integrated study*. (193-207). Basingstoke, UK: Macmillan.

McCall, L. (2005). The complexity of intersectionality. *Signs: Journal of Women in Culture and Society, 30*(3), 1771-1800.

McCloud, S. (1993). *Understanding comics: The invisible art.* New York, NY: HarperCollins Publishers.

McCrory Wallace, R., Kupperman, J., Krajcik, J., & Soloway, E. (2000). Science on the web: Students online in a sixth-grade classroom. *The Journal of the Learning Sciences, 9*(1), 75-104.

McKenzie, J. (2000). Beyond technology: Making a difference in student performance. Retrieved from: http://www.electronicschool.com/2000/03/0300f1.html

McKinnon, J. (2000, September 23). Companies push for tax breaks under guide of easing digital divide. *Wall Street Journal*, p. B1.

Merleau-Ponty, M. (2012). *Phenomenology of perception.* (DA Landes, Trans.). Abingdon, UK: Routledge and Kegan Paul. (Original work published in 1945).

Merleau-Ponty, M. (1974). *Phenomenology, language and sociology: selected essays of Maurice Merleau-Ponty*. Abingdon, UK: Routledge and Kegan Paul.

Merriam-Webster Dictionary. (2018). America's most-trusted online dictionary. (2017). *Merriam-Webster*. Retrieved from: https://www.merriam-webster.com/

Michelli, N., & Keiser, D. L. (2005). *Teacher education for democracy and education*. New York: NY: Routledge.

Miller, L. (2018, March 2). War Room: The teenage strategy session that built an anti-gun movement out of the trauma of Parkland in one week. *New York Magazine*. Retrieved from: http://nymag.com/daily/intelligencer/2018/03/on-the-ground-with-parkland-teens-as-they-plot-a-revolution.html

Miller, L. (2016). Claiming technology for democracy and social justice: An approach to educational technology. In Miller, Becker & Becker. (Eds.), *Technology for transformation: Perspectives of hope in the digital age*. (19-32). Charlotte, NC: Information Age Publishing.

Miller, Becker & Becker. (Eds.). (2016). *Technology for transformation: Perspectives of hope in the digital age*. Charlotte, NC: Information Age Publishing.

Miller, T., Baird, T., Littlefield, C., Kofinas, G., Chapin III, F. S., & Redman, C. (2008).

Epistemological pluralism: reorganizing interdisciplinary research. *Ecology and Society*, *13*(2).

Minnesota Department of Education. (2017a). Minnesota Report Card [Data File]. Retrieved from: http://rc.education.state.mn.us/

Minnesota Department of Education. (2017b). *Staffing profile*. [Website]. Minnesota Report Card. Retrieved from: http://rc.education.state.mn.us/#staffing/orgId--999999000000__groupType--state__p--2

Minnesota Department of Education. (2017c). *2017 Report of teacher supply and demand in Minnesota's public schools: Fiscal year 2017 report to the legislature as required by Minnesota statutes, section 127A.05, subdivision 6*. [Report]. Retrieved from: http://www.leg.state.mn.us/lrl/lrl/asp

Minnesota Professional Educator Licensing and Standards. (2018). Retrieved from: https://mn.gov/pelsb/

Minnesota Department of Natural Resources. (2018). Retrieved from: https://www.dnr.state.mn.us/

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017-1054.

Mitchell, C., & Weber, S. (1999). *Reinventing ourselves as teachers: Beyond nostalgia*. London: Routledge Falmer.

Mollison, A. (2004, November 26). Classrooms at forefront of digital age. *The Atlanta Journal-Constitution*, p. C.2.

Molnar, A. R. (1997). Computers in education: A brief history. *T.H.E. Journal, 24*(11), 63-69.

Moran, D. (2001). *Introduction to phenomenology*, Robert Sokolowski. New York, NY: Routledge.

Morehead, H. (1955, December). Television and learning. *Educational Leadership, 13*(3), 167-179.

Moreno, S. (2000, February 3). President aims to leap the digital divide. *Washington Post*, p. B4.

MotoVike Films. [Username]. Teach Us All. [Documentary Trailer, Video file]. Retrieved from: https://youtu.be/I5hE2Xm_dDQ

Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA: SAGE.

Mouza, C. (2011). Promoting urban teachers' understanding of technology, content, and pedagogy in the context of case development. *Journal of Research on Technology in Education, 44*(1), 1-29.

Mun Wah, L. (2004). *The Art of Mindful Facilitation*. Berkeley, CA: StirFry Seminars & Consulting.

National Association for the Education of Young Children. (2018). National Association for the Education of Young Children: Promoting high-quality learning by connecting practice, policy, and research. [Website]. Retrieved from: https://www.naeyc.org/

National Association for the Education of Young Children, Fred Rogers Center for Early

Learning and Children's Media. (2012). *Policy statement: Technology and interactive media as tools in early childhood programs serving children from birth through age 8*. Washington, D.C.

National Center of Educational Statistics. (2002, November). *Technology integration, technology in schools: Suggestions, tools, and guidelines for assessing technology in elementary and secondary education*. Washington, D.C.: NCES.

National Center of Educational Statistics. (2005). *Integrating your technology*. Washington, D.C.: NCES.

National Center for Education Statistics (2010). *Elementary education and teaching*. Washington, D.C.: NCES.

National Center for Education Statistics. (2012). *Schools and Staffing Survey 2011-2012 (SASS)*. [Public School Teacher Data File.]. U.S. Department of Education. Retrieved from: https://nces.ed.gov/surveys/sass/tables/sass1112_2013314_t1s_002.asp

National Science Education Standards. (2003). National Committee on Science Education Standards and Assessment, *National Research Council*. Washington, D.C.: National Academy Press. Retrieved from: https://www.csun.edu/science/ref/curriculum/reforms/nses/nses-complete.pdf

National Science Foundation (2008). *Fostering learning in the networked world: The cyberlearning opportunity and challenge*. A 21st Century agenda for the National Science Foundation. Retrieved from: http://www.nsf.gov/pubs/2008/nsf08204/nsf08204.pdf

National Telecommunications and Information Administration. (1995, July 12). Falling through the net: A survey of the" have nots" in rural and urban America. *Department of Commerce, US Government, Washington, D.C*. Retrieved from: https://www.ntia.doc.gov/ntiahome/fallingthru.html

National Telecommunications and Information Administration. (1998, July 28). Falling through the net II: New data on the 'digital divide'. *Department of Commerce, US Government, Washington, D.C*. Retrieved from: https://www.ntia.doc.gov/report/1998/falling-through-net-ii-new-data-digital-divide

National Telecommunications and Information Administration. (1999, July 8). Falling through the net: Defining the digital divide. *Department of Commerce, US Government, Washington, D.C*. Retrieved from: https://www.ntia.doc.gov/legacy/ntiahome/fttn99/contents.html

National Telecommunications and Information Administration. (2000, October 16). Falling through the net: Toward digital inclusion. *Department of Commerce, US Government, Washington, D.C*. Retrieved from: https://www.ntia.doc.gov/files/ntia/publications/fttn00.pdf

Newcomb, A. (2018, February 22). How Parkland's social media-savvy teens took back the internet – and the gun control debate. *NBC News*. Retrieved from: https://www.nbcnews.com/tech/tech-news/how-parkland-students-are-using-social-media-keep-gun-control-n850251

Newman, D. M. (2018). The architecture of stratification: Social class and inequality. In

Sociology: Exploring the architecture of everyday life. Thousand Oaks, CA: Sage Publications.

Nielsen-Winkelman, T., & West, L. (2016). Critical literacy: Opportunities for learner agency. (Unpublished doctoral CI 8131 course paper). University of Minnesota, Minneapolis, MN.

Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge University Press.

Norris, D. T., & Conceicao, S. (2004). Narrowing the digital divide in low-income, urban communities. *New Directions for Adult and Continuing Education, 101*, 69–81.

Norris, C., Sullivan, T., Poirot, J., & Soloway, E. (2003). No access, no use, no impact: Snapshot survey of educational technology in K-12. *Journal of Research on Technology in Education*, *36*(1), 15-27.

Office of Educational Technology. (2017, January). Reimagining the role of technology in education: 2017 National education technology plan update. *U.S. Department of Education*. Retrieved from: https://tech.ed.gov/

Okojie, M., Olinzock, A., & Okojie-Boulder, T. (2006). The pedagogy of technology integration. *The Journal of Technology Studies, 32*(2). Retrieved from: https://doi.org/10.21061/jots.v32i2.a.1

Ono, H., & Zavodny, M. (2007). Digital inequality: A five country comparison using microdata. *Social Science Research*, *36*(3), 1135-1155.

Ottenbreit-Leftwich, A. T., Glazewski, K. D., Newby, T. J., & Ertmer, P. A. (2010). Teacher value beliefs associated with using technology: addressing professional and student needs. *Computers and Education, 55*(3), 1321–1335.

Page, M. S. (2002). Technology-enriched classrooms: Effects on students of low socioeconomic status. *Journal of Research on Technology in Education*, *34*(4), 389-409.

Pajares, M. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, *62*(3), 307-332.

Palak, D., & Walls, R. (2009). Teachers' beliefs and technology practices: a mixed-methods approach. *Journal of Research on Technology in Education, 41*(4), 417–441.

Papert, S. (1980). *Mindstorms: Children, computers and powerful ideas*. New York, NY: Basic Books.

Papert, S. (1993). The children's machine. *Technology Review. Manchester, NH. (96), 28.*

Pardi, P. (2011, September 2011). What is knowledge? *Philosophy News*. Retrieved from: http://www.philosophynews.com/post/2011/09/22/What-is-Knowledge.aspx

Parkison, P. (2008). Space for performing teacher identity: Through the lens of Kafka and Hegel. *Teachers and Teaching: Theory and Practice*, *14*(1), 51-60.

Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers & Education*, *37*(2), 163-178.

Perrin, A. (2017a, May 19). Digital gap between rural and non-rural America persists. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2017/05/19/digital-gap-between-rural-and-nonrural-america-persists/

Perrin, A. (2017b, August 31). Smartphones help blacks, Hispanics bridge some – but not all – digital gaps with whites. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2017/08/31/smartphones-help-blacks-hispanics-bridge-some-but-not-all-digital-gaps-with-whites/

Perry, A. (1929). *Radio in education: The Ohio School of the Air and other experiments*. New York, NY: The Payne Fund.

PEW Research Center. (2018). *FactTank* [Website]. Washington, D.C. Retrieved from: http://www.pewresearch.org/

Porfilio, B. (2016). Foreword in Miller, Becker & Becker. (Eds.). (2016). *Technology for Transformation: Perspectives of hope in the digital age*. Charlotte, NC: Information Age Publishing.

Project Tomorrow. (2013) *Speak Up* [Website.]. Retrieved from: http://www.tomorrow.org/speakup/

Puentedura, R. R. (2012). *The SAMR Model: Background and Exemplars*. [Weblog post]. Retrieved from: http://www.hippasus.com/rrpweblog/archives/2012/08/23/SAMR_BackgroundEx emplars.pdf

Puentedura, R. R. (2013). *SAMR: Moving from enhancement to transformation*. [Web log post]. Retrieved from: http://www.hippasus.com/rrpweblog/archives/2013/05/29/SAMREnhancementTo Transformation.pdf

Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013, February 28). How teachers are using technology at home and in their classrooms. *PEW Research Center*. Retrieved from: http://www.pewinternet.org/2013/02/28/how-teachers-are-using-technology-at-home-and-in-their-classrooms/

Rainie, L. & Anderson, J. (2017, May 3). The future of jobs and training. *PEW Research Center*. Retrieved from: http://www.pewinternet.org/2017/05/03/the-future-of-jobs-and-jobs-training/

Reading Rockets. [Username]. (2015, January 30). *Mirrors, windows and sliding glass doors - an interview with Dr. Rudine Sims Bishop*. [Video file]. Retrieved from: https://youtu.be/_AAu58SNSyc

Reeves, S., Albert, M., Kuper, A., & Hodges, B. D. (2008). Why use theories in qualitative research. *BMJ, 337*(7670), 631-634.

Reinhart, J. M., Thomas, E., & Toriskie, J. M. (2011). K-12 teachers: Technology use and the second level digital divide. *Journal of Instructional Psychology, 38*(3/4), 181-193.

Reiser, R. A. (2001). A history of instructional design and technology: Part I: A history of instructional media. *Educational Technology, Research and Development, 49*(1), 53-64.

Resources for closing the digital divide. [Website]. (2016, June 21). Retrieved from: https://www.edutopia.org/digital-divide-technology-access-resources

Rizvi, F. (1998). Some thoughts on contemporary theories of social justice, In Atweh, B., Kemmis, S., & Weeks, P. (Eds.), *Action research in practice: Partnerships for social justice in education*. 47-56. London, UK: Routledge.

Rogers, E. M. (2001). The digital divide. *Convergence*, *7*(4), 96-111.

Rokeach, M. (1968). *Beliefs, attitudes, and values: A theory of organization and change*. San Francisco, CA: Jossey-Bass.

Ronnkvist, A., Dexter, S., & Anderson, R. (2000, June). *Technology support: Its depth, breadth, and impact on America's schools: Teaching, learning, and computing 1998 survey, report # 5*. Irvine, CA: Center for Research on Information, Technology, and Organizations at University of California, Irvine and the University of Minnesota, Minneapolis. Retrieved from: http://crito.uci.edu/papers/TLC/findings/technology-support/.

Roschelle, J., Pea, R., Hoadley, C., Gordin, D., & Means, B. (2001). Changing how and what children learn in school with computer- based technologies. *The Future of Children, 10*(2), 76-101.

Rosen, L. D., Cheever, N. A., & Carrier, L. M. (2010). *Rewired: Understanding the iGeneration and the way they learn*. New York, NY: Palgrave Macmillan.

Santayana, G. (n.d.). George Santayana (1863-1952). *Internet Encyclopedia of Philosophy: A Peer-Reviewed Academic Resource* [Website]. Retrieved from: https://www.iep.utm.edu/santayan/

Schneiderman, M. (2004). What does SBR means for education technology? *T.H.E. Journal, 31*(11), 30-36.

Schneider, S. B., & Smith, D. (2014). Constructing and reconstructing a critical discourse and pedagogy of techno-knowledge. *Educational Studies*, *50*(1), 3-7.

Schommer, M. (1994). Synthesizing epistemological belief research: Tentative understandings and provocative confusions. *Educational Psychology Review*, *6*(4), 293-319.

Seale, J. (2010). *Digital inclusion: A research briefing by the technology-enhanced learning phase of the teaching and learning research programme* (London Knowledge Lab Publication). London, UK. Retrieved from: http://www. tlrp. org/docs/DigitalInclusion. pdf.

Seiler, R. M. (2008). *Human communication in the critical theory tradition*. [Website]. Retrieved from: http://people.ucalgary.ca/~rseiler/critical.htm

Sell, G. R., Cornelius-White, J., Chang, C., McLean, A., & Roworth, W. (2012). *A meta-synthesis of research on 1: 1 technology initiatives in k-12 education*. Ozarks Educational Research Initiative, Institute for School Improvement. Missouri State University, Springfield. Retrieved from: https://education.missouristate.edu/assets/clse/Final_Report_of_One-to-One_Meta-Synthesis__April_2012_.pdf

Selwyn, N. (2003). Apart from technology: understanding people's non-use of information and communication technologies in everyday life. *Technology in Society*, *25*(1), 99-116.

Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, *6*(3), 341-362.

Selwyn, N. (2010). Looking beyond learning: Notes towards the critical study of educational technology. *Journal of Computer Assisted Learning*, *26*(1), 65-73.

Selwyn, N. (2016). *Education and technology: Key issues and debates*. New York, NY:

Continuum International Publishing Group.

Selwyn, N., Gorard, S., & Williams, S. (2001). Digital divide or digital opportunity? The role of technology in overcoming social exclusion in US education. *Educational Policy*, *15*(2), 258-277.

Sfard, A., & Prusak, A. (2005). Telling identities: In search of an analytic tool for investigating learning as a culturally shaped activity. *Educational Researcher*, *34*(4), 14-22.

Shaw, D. (2000, September 8). *K-12 education: Acting on ignorance*. Education Commission [Report.].

Shifflet, R., & Weilbacher, G. (2015). Teacher beliefs and their influence on technology use: A case study. *Contemporary Issues in Technology and Teacher Education*, *15*(3), 368-394.

Shulman, L. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, *57*(1), 1-23.

Slattery, P. (2012). *Curriculum development in the postmodern era: Teaching and learning in an age of accountability* (2nd ed.). New York, NY: Routledge. Retrieved from: https://epdf.tips/curriculum-development-in-the-postmodern-era-second-edition-critical-education-p.html

Smerdon, B., Cronen, S., Lanahan, L., Anderson, J., Iannotti, N., & Angeles, J. (2000). *Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology* [Statistical Analysis Report]. National Center for Education Statistics. Washington, D.C. Retrieved from: Teachers' Tools for the 21st Century: A Report on Teachers' Use of Technology

Smith, M. (2016, January 30). Computer science for all. *The White House: President Barack Obama.* Retrieved from: https://obamawhitehouse.archives.gov/blog/2016/01/30/computer-science-all

Soep, E. (2014). *Participatory Politics: Next-generation Tactics to Remake Public Spheres*. Cambridge, MA: The MIT Press.

Solomon, D. L. (2000). Toward a post-modern agenda in instructional technology. *Educational Technology Research and Development*, *48*(4), 5-20.

Songer, N. B., Lee, H.-S., & Kam, R. (2002). Technology-rich inquiry science in urban classrooms: What are the barriers to inquiry pedagogy? *Journal of Research in Science Teaching*, *39*(2), 128-150.

Spears, R., Postmes, T., Wolbert, A., Lea, M., & Rogers, P. (2000). *Social Psychological Influence of ICTs on Society and their Policy Implications*. University of Amsterdam, Amsterdam, NL and University of Manchester, UK: Infodrome, Retrieved from: https://pdfs.semanticscholar.org/f9e2/4f6a2ac7b93c7485f84f7e52c9fa4a400586.pdf

St. Pierre, E. A. (1997). Nomadic inquiry in the smooth spaces of the field: A preface. *International Journal of Qualitative Studies in Education*, *10*(3), 365-383.

St. Pierre, E. A. (2013). The posts continue: Becoming. *International Journal of Qualitative Studies in Education*, *26*(6), 646-657.

Stanford Encyclopedia of Philosophy. (2005, March 8). Bohman, J. [Author]. *Critical*

theory. (Spring ed.). [Website]. Retrieved from:
https://plato.stanford.edu/entries/critical-theory/

Stanford Encyclopedia of Philosophy. (2016, September 21). Bohman, J. [Author].
Critical theory. (Fall ed.). [Website]. Retrieved from:
https://plato.stanford.edu/archives/fall2016/entries/critical-theory/

Staples, A., Pugach, M., & Himes, D. (2005). Rethinking the technology integration
challenge: Cases from three urban elementary schools. *Journal of Research on
Technology in Education*, *37*(3), 285-311.

Symcox, L. (2002). *Whose history?: The struggle for national standards in American
classrooms*. New York, NY: Teachers College Press.

Talmy, S. (2011). The interview as collaborative achievement: Interaction, identity, and
ideology in a speech event. *Applied Linguistics*, *32*(1), 25-42.

Teach Us All: Social Action Toolkit. (2017). Retrieved from:
https://static1.squarespace.com/static/5724e569b09f951c90c9c390/t/59c15c75841
9c24d5e1dd606/1505844345973/TEACH+US+ALL+-
+Social+Action+Toolkit+%28Final%29.pdf

TEDx Talks. [Username]. *The Windows and mirrors of your child's bookshelf with Grace
Lin*. [Video file]. Retrieved from: https://youtu.be/_wQ8wiV3FVo

Tetenbaum, T. J., & Mulkeen, T. A. (1984). Logo and the teaching of problem solving: A
call for a moratorium. *Educational Technology*, *24*(11), 16-19.

The American School of the Air. (1930, March). *The Instructor, 39*(5), 6-7.

The Office of the Revisor of Statutes. (2016). *Minnesota Standards of Effective Practice
for Teachers*. Minnesota Administrative Rules. Retrieved from:
https://www.revisor.mn.gov/rules/?id=8710.2000

Tu, C-H., Yen, C-J., & Sujo-Montes, L. (2016). Network learning literacy. In Miller,
Becker & Becker. (Eds.). *Technology for transformation: Perspectives of hope in
the digital age*. (87-106). Charlotte, NC: Information Age Publishing.

Tuck, E., & Yang, W. (Eds.). (2018). *Toward what justice?: Describing diverse dreams
of justice in education.* New York, NY: Routledge.

Twining, P., Raffaghelli, J., Albion, P., & Knezek, D. (2013). Moving education into
the digital age: the contribution of teachers' professional development. *Journal of
Computer Assisted Learning, 29*, 426e437.

United Nations. (2013). *Inequality matters. Report on the World Social Situation 2013*
[Report.]. New York, NY: United Nations.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2011,
November). *UNESCO ICT Competency Framework for Teachers* [Website].
Retrieved from: http://www.unesco.org/new/en/communication-and-
information/access-to-knowledge/unesco-ict-competency-framework-for-
teachers/

United Nations Secretary-General. (2003, June 18). Secretary-General's Message. *Net
World Order: Bridging the Global Digital Divide Conference*. New York, NY.

Untitled Productions. [Username, Producer]. (2016). The Lie. [Video file]. Pastor, K.
(Director, Producer). Retrieved from: https://vimeo.com/182020903

United States Department of Commerce. (2018). [Website.]. Washington, D.C.: U.S.

Department of Commerce. Retrieved from: https://www.commerce.gov/

U.S. Department of Education. (2001). No child left behind act of 2001, Public Law 107-110. Retrieved from: http://www.ed.gov/nclb/landing.jhtml

United States Department of Education (2003a). *Technology in Schools: Suggestions, Tools and Guidelines for Assessing Technology in Elementary and Secondary Education* (National Center for Education Statistics 2003-313) [Report.]. Washington, D.C.: U.S. Department of Education. Retrieved from: https://nces.ed.gov/pubs2003/2003313.pdf

U.S. Department of Education (DOE). (2003b). *Federal funding for educational technology and how it is used in the classroom: A summary of findings from the integrated studies of educational technology* [Report.]. Policy and program studies service. Washington, D.C.: U.S. Department of Education. Retrieved from: https://www2.ed.gov/rschstat/eval/tech/iset/summary2003.pdf

U.S. Department of Education. (2007). Documentation for the 2003–04 schools and staffing survey, NCES 2007–337. Retrieved from: http://eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED495685

United States Department of Education. (2018). [Website.]. Retrieved from: https://www.ed.gov/

University of Minnesota. (2018). Minnesota Agricultural Experiment Station. [Website.]. *Regents of the University of Minnesota*, Minneapolis, MN. Retrieved from: https://www.maes.umn.edu/

University of Minnesota. (2018). Aquatic Invasive Species Research Center (MAISRC). [Website.]. *Regents of the University of Minnesota*, Minneapolis, MN. Retrieved from: https://www.maisrc.umn.edu/ais-mn

Vagle, M. D. (2010). Re-framing Schön's call for a phenomenology of practice: a post-intentional approach. *Reflective Practice*, *11*(3), 393-407.

Vagle, M. D. (2012). *Not a stage! A critical re-conception of young adolescent education. Adolescent Cultures, School and Society (Vol. 60)*. New York, NY: Peter Lang.

Vagle, M. D. (2014). *Crafting phenomenological research*. Walnut Creek, CA: Left Coast Press.

Vagle, M. D. (2015). Curriculum as post-intentional phenomenological text: Working along the edges and margins of phenomenology using post-structuralist ideas. *Journal of Curriculum Studies*, *47*(5), 594-612.

Vagle, M. D. (2018). *Crafting phenomenological research, 2nd Edition*. New York: Routledge.

Vagle, M. D., Clements, C. H., & Coffee, A. C. (2017). Analytic productions in post-intentional phenomenological research. *Cultural Studies ↔ Critical Methodologies*, *17*(6), 427-441.

Vagle, M. D., & Hofsess, B. A. (2016). Entangling a post-reflexivity through post-intentional phenomenology. *Qualitative Inquiry*, *22*(5), 334-344.

Valadez, J. R., & Duran, R. (2007). Redefining the digital divide: Beyond access to computers and the Internet. *The High School Journal*, *90*(3), 31-44.

Valenzuela, A. (1999). *Subtractive schooling: Issues of caring in education of US-Mexican youth*. State University of New York Press.

Valenzuela, A. (2010). *Subtractive schooling: US-Mexican youth and the politics of caring*. Suny Press.

Vandewater, E. A., & Lee, S. J. (2009). Measuring children's media use in the digital age: issues and challenges. *American Behavioral Scientist*, *52*(8), 1152-1176.

Van Dijk, J. (2005). *The deepening divide: Inequality in the information society*. Sage Publications.

Van Manen, M. (1997). From meaning to method. *Qualitative Health Research*, *7*(3), 345-369.

van Manen, M. (2001). Professional practice and 'doing phenomenology'. In *Handbook of Phenomenology and Medicine* (pp. 457-474). Springer Netherlands.

van Manen, M. (2014). *Phenomenology of practice: Meaning-giving methods in phenomenological research and writing*. Walnut Creek, CA: Left Coast Press.

Verdugo, D. R., & Belmonte, I. A. (2007). Using digital stories to improve listening comprehension with Spanish young learners of English. *Language Learning & Technology*, *11*(1), 87-101.

Villegas-Reimers, E. (2003). *Teacher professional development: An international review of the literature*. Paris: International Institute for Educational Planning.

Vrasidas, Zembylas & Glass. (Eds.). (2009). *ICT for education, development, and social justice*. Charlotte, NC: Information Age Publishing.

Walling, B., & Lewis, M. (2000). Development of professional identity among professional development school preservice teachers: Longitudinal and comparative analysis. *Action in Teacher Education*, *22*(Issue 2), 65-72.

Ward, L., & Parr, J. M. (2010). Revisiting and reframing use: Implications for the integration of ICT. *Computers & Education*, *54*(1), 113-122.

Warnick, B., & Burbules, N. (2007). Media comparison studies: Problems and possibilities. *Teachers College Record*, *109*(11), 2483-2510.

Warschauer, M. (2000). Language, identity, and the Internet. In Kolko, B., Nakamura, L. & Rodman, G. (Eds.), *Race in Cyberspace* (151-170). New York, NY: Routledge.

Warschauer, M. (2003). Demystifying the digital divide. *Scientific American*, *289*(2), 42-47.

Warschauer, M. (2004). *Technology and social inclusion: Rethinking the digital divide*. Cambridge, MA: MIT press.

Warschauer, M. (2007). A teacher's place in the digital divide. *Yearbook of the National Society for the Study of Education*, *106*(2), 147-166.

Warschauer, M. (2011a). A literacy approach to the digital divide. In M.A. Pereyra (Ed.), *Las mulialfabetizaciones en el espacio digital. Malaga, Spain: Ediciones Aljibe*. 1-40.

Warschauer, M. (2011b). *Learning in the cloud: How (and why) to transform schools with digital media*. New York, NY: Teachers College Press.

Warschauer, M., Knobel, M., & Stone, L. (2004). Technology and equity in schooling: Deconstructing the digital divide. *Educational policy*, *18*(4), 562-588.

Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds:

Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, *34*(1), 179-225.

Watkins, W. (2001). *The white architects of black education: Ideology and power in America*, 1865-1954. New York, NY: Teachers College Press.

Watson, G. (2006). Technology professional development: Long-term effects on teacher efficacy. *Journal of Technology and Teacher Education, 14*(1), 151-165.

Webb, N. L. (2002). Depth-of-knowledge levels for four content areas. *Language Arts* [Document]. Retrieved from: http://ossucurr.pbworks.com/w/file/fetch/49691156/Norm%20web%20dok%20by %20subject%20area.pdf

Webb, N. L. (1997). *Determining alignment of expectations and assessments in mathematics and science education*. National Institute for Science Education Brief (Vol. 1, No. 2). Madison, WI: National Institute for Science Education, University of Wisconsin-Madison.

Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of Educational Research*, *79*(2), 702-739.

Weston, M. E., & Bain, A. (2010). The end of techno-critique: The naked truth about 1:1 laptop initiatives and educational change. *The Journal of Technology, Learning and Assessment*, *9*(6). 5-25.

White, J. (2004, October 12). Digital Age. *The Patriot Ledger*, p. 9.

White House Task Force on Childhood Obesity Report to the President. (2010, May). Solving the problem of childhood obesity within a generation. *Domestic Policy Council*. Retrieved from: https://letsmove.obamawhitehouse.archives.gov/sites/letsmove.gov/files/TaskForc e_on_Childhood_Obesity_May2010_FullReport.pdf

Willingham, AJ. (2018, March 26). Thousands of new voters signed up during the March for Our Lives. *CNN*. Retrieved from: https://www.cnn.com/2018/03/26/us/march-for-our-lives-voters-registration-headcount-trnd/index.html

Wiske, S. (2004). Using Technology to Dig for Meaning. *Educational Leadership, 62*(1), 46.

Without a net: The digital divide in America. [Video Documentary]. (2017). Kennedy, R. (Director, Producer). Retrieved from: http://www.digitaldivide.com/

Wozney, L., Venkatesh, V., & Abrami, P. (2006). Implementing computer technologies: Teachers' perceptions and practices. *Journal of Technology and Teacher Education, 14*(1), 173-207.

Yeaman, A. R., Hlynka, D., Anderson, J., Damarin, S. K., & Muffoletto, R. (1996). Postmodern and poststructural theory. In Jonassen, D. H. (1996). *Handbook of Research for Educational Communications and Technology*. A Project of the Association for Educational Communications and Technology (AECT). 199-214. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Young, I. M. (2011). *Justice and the Politics of Difference*. Princeton, NJ: Princeton University Press.

Zhao, Y., & Frank, K. A. (2003). Factors affecting technology uses in schools: An ecological perspective. *American Educational Research Journal, 40*(4), 807-840.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record, 104*(3), 482-515.

Zielezinski, M. (2016, May 19). What a decade of education research tells us about technology in the hands of underserved students. *EdSurge*. Retrieved from: https://www.edsurge.com/news/2016-05-19-what-a-decade-of-education-research-tells-us-about-technology-in-the-hands-of-underserved-students

Zillien, N., & Hargittai, E. (2009). Digital distinction: Status-specific types of internet usage. *Social Science Quarterly*, *90*(2), 274-291.

Appendices

Appendix A: IRB Approval

UNIVERSITY OF MINNESOTA

Twin Cities Campus

Human Research Protection Program
Office of the Vice President for Research

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420 Delaware Street S.E.
MMC 820
Minneapolis, MN 55455

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http://www.research.umn.edu/subjects/

APPROVAL OF NEW STUDY

October 24, 2017

Mark Vagle

612-384-2262
mvagle@umn.edu

Dear Mark Vagle:

On 10/24/2017, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Elementary Educators Pursuing More Equitable Technology Integration Practices
Investigator:	Mark Vagle
IRB ID:	STUDY00001203
Sponsored Funding:	None
Grant ID/Con Number:	None
Internal UMN Funding:	None
Fund Management Outside University:	None
IND, IDE, or HDE:	None
Documents Reviewed with this Submission:	• TNW's HRP-582 Social_Behavioral Consent Form.pdf, Category: Consent Form; • TNW's HRP-580 Social/Behavioral Template Protocol, Category: IRB Protocol; • TNW's Recruitment Video Script (included in the HRP-580 Social Protocol), Category: Recruitment Materials; • TNW's Recruitment Interest Survey (included in the HRP-580 Social Protocol), Category: Recruitment Materials; • TNW's Research Support Letter, Category: Letters of Support / Approvals (Location)

Driven to Discover℠

The IRB determined that the criteria for approval have been met and that this study involves no greater than minimal risk.

This study was approved under Expedited Category(ies):

- (7) Research on individual or group characteristics or behavior or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The IRB approved the study from 10/20/2017 to 10/19/2018 inclusive. You will be sent a reminder from ETHOS to submit a Continuing Review submission for this study. You must submit your Continuing Review no later than 30 days prior to the last day of approval in order for your study to be reviewed and approved for another Continuing Review period. If Continuing Review approval is not granted before 10/19/2018, approval of this protocol expires immediately after that date.

You must also submit a Modification in ETHOS for review and approval prior to making any changes to this study.

If consent forms or recruitment materials were approved, those are located under the Final column in the Documents tab in the ETHOS study workspace.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the HRPP Toolkit Library on the IRB website.

For grant certification purposes, you will need the approval and last day of approval dates listed above and the Assurance of Compliance number which is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003).

Sincerely,

Clinton Dietrich, MA, CIP
IRB Analyst

We value feedback from the research community and would like to hear about your experience. The link below will take you to a brief survey that will take a minute or two to complete. The questions are basic, but your responses will help us better understand what we are doing well and areas that may require improvement. Thank you in advance for completing the survey.

Even if you have provided feedback in the past, we want and welcome your evaluation.

https://umn.qualtrics.com/SE/?SID=SV_5BiYrqPNMJRQSBn

Appendix B: Invitation to Participate in Research Study

Participant Recruitment (email - Researcher Initial Contact)

Hello [Participant Name]!

My name is Tiffany Nielsen-Winkelman. I am a PhD Candidate in Learning Technologies and Elementary Education in the Department of Curriculum and Instruction at the University of Minnesota. As the final step in my doctoral degree I would like to invite you to join me in learning together about more equitable technology integration in elementary classrooms.

I am seeking licensed K-5 classroom teachers as participants.

Given the realities of our digital world, teaching and learning with technology in innovative ways is a part of the work we do daily in classrooms. Additionally, as you know, we have a responsibility to engage in ongoing equity work in education. Together through activities and discussions participants in this study's professional learning cohort will examine technology integration as a path to address issues of equity in education and the opportunity gap of learners.

The professional learning cohort will collaborate to select topics and activities. Some topics may include:
- digital divide
- digital usage divide
- participatory technology integration
- race, social class and gender in the classroom
- anti-bias education
- ICT for social justice
- technology integration beliefs and practices

Participants will take part in a professional learning cohort. Together we will:
1. Meet as a cohort between November and January (7.5 hours total)
2. Collaborate to select topics and engage in professional learning activities
3. Wrap up our learning journey with a conversational interview in December/January (approximately 1 hour)

Depending upon interest, and if the cohort will be comprised of educators from multiple schools, there are two options for cohort meeting structure.
- Option 1: The cohort meets 5 times for 1-1.5 hours per meeting after school
- Option 2: The cohort meets 2-3 times for 2.5-3.5 hours per meeting on mutually agreed upon dates/times (evenings/weekends)

Please note: Participation is voluntary and you will be compensated $200.00 for your engagement.

I am asking you to consider your interest in taking part in this professional learning cohort, a component of my dissertation research. As an elementary educator who integrates technology into teaching and learning, in a school setting that strives to close the opportunity gap, I think you may be a good fit for this collaborative learning journey. We will be intentional about connecting our learning directly back to your classroom. Together we will explore the pursuit of more equitable technology integration practices.

Please take a few minutes to complete the brief **Professional Learning Cohort Interest Survey** (Google Form, see below for details) to explore interest in our professional learning cohort and research.

"If not us, then who? If not now, then when?" (Sethi, 2012)
We can learn about this and make change together!

Thank you for your time and consideration. I am happy to follow up with you to discuss this opportunity further.

Have a great day!
Tiffany Nielsen-Winkelman
niels561@umn.edu

Professional Learning Cohort Interest Survey (Google Form - Participant Response to email)

Name (short answer)

School (short answer)

I teach… (multiple choice: Kindergarten; First Grade; Second Grade; Third Grade; Fourth Grade; Fifth Grade; Other)

I have taught for ____. (multiple choice: 1-3 years; 4-6 years; 7-10 years; 11+ years)

What strikes you as interesting about this professional learning cohort exploring the 'pursuing more equitable technology integration' topic? (long answer)

Please share any questions, concerns or desired clarifications. (long answer)

I would be available to participate in a professional learning cohort November-January. (select all that apply) (checkboxes: Option 1: The cohort meets 5 times for 1-1.5 per

meeting after school; Option 2: The cohort meets 2-3 time for 2.5-3.5 hours per meeting on mutually agreed upon dates)

May Tiffany contact you for a follow up conversation about your interest in participating in the professional learning cohort? (multiple choice: Yes, please. I look forward to learning more about this opportunity.; No thank you.)

Appendix C: Research Consent Form

Research Consent Form

Title of Research Study: Elementary Educators Pursuing More Equitable Technology Integration Practices

Researcher: Tiffany Nielsen-Winkelman

Supported By: This research is supported by the University of Minnesota. **IRB Study #:** STUDY00001203

Why am I being asked to take part in this research study?

I am inviting you to take part in this professional learning cohort, a component of my dissertation research study. As an elementary educator who will be integrating technology into teaching and learning, in a school setting that strives to close the opportunity gap, I think you are a good fit for this collaborative learning journey. Together we will explore the pursuit of more equitable technology integration practices.

<u>Background Information</u>: Technology integration practices, whether intended or not, privilege and marginalize particular groups of people. Technology is integrated into teaching and learning in vast and disparate ways (Hollingworth, Allen, Hutchings, Abol Kuyok & Williams, 2008; Reinhart, Thomas & Toriskie, 2001; Tyson, 2015; Warschauer, 2004; Warschauer, Knobel & Stone, 2004; Warschauer & Matuchniak, 2010) either disrupting or reifying educational disparities.

<u>Purpose</u>: Given inequities in technology integration practices, the purpose of this study is to explore how might the pursuit of more equitable technology integration practices take shape for elementary educators in a diverse school community.

<u>Who Can Participate?</u>: Kindergarten - Grade 5 classroom teachers, who wish to participate in this research study's professional learning cohort and interview, will complete this consent form.

What should I know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

Who can I talk to?

For questions about research appointments, the research study, research results, or other concerns, you may contact the study team at:

Faculty Researcher Advisor: Cassandra Scharber	**Faculty Researcher Advisor:** Mark Vagle
Email Address: scharber@umn.edu	**Email Address:** mvagle@umn.edu
- OR -	
Researcher: Tiffany Nielsen-Winkelman	
Email Address: niels561@umn.edu	

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This research has been reviewed and approved by an Institutional Review Board (IRB) within the Human Research Protections Program (HRPP). To share feedback privately with the HRPP about your research experience, call the Research Participants' Advocate Line at 612-625-1650 or go to https://research.umn.edu/units/hrpp/research-participants/questions-concerns. **You are encouraged to contact the HRPP if**:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

Why is this research being done?

Introduction: Learning technologists actively research learning, utilizing information and communication technologies (ICT) and other related educational technologies, with aims to facilitate learning processes and improve education. Technology usage is not neutral - "it should be approached as a social and behavioral phenomenon" (Barzilai-Nahon, 2006, p. 275). Warnick and Burbules (2007), in their examination of media comparison studies, suggest media (technology) researchers move beyond comparing effectiveness of media as an information delivery system towards a reflection of holistic educational practices. Holistic explorations of social issues at work within technology integration for learning encompass intersections (e.g. people, social systems and use of ICT; knowledge production, social participation and context relevance; power, positioning and privilege; identity (beliefs) and teaching practices; knowledge, power, society and identity, etc.). It is in these intersections that educational inequities may be revealed and productively disrupted.

Teaching practices, whether intended or not, privilege and marginalize particular groups of people (Nielsen-Winkelman & West, 2016). A critical viewing of what and how learners are taught in the digital age sheds light onto the relationship between people, social systems (schools), and their use of ICT to understand how they produce, reify and deconstruct educational disparities. Technology integration and teaching practices in society are vital to social participation and knowledge production. However, when the affordances of technology are not in dialogue with a critical lens, modern practices of social participation and knowledge construction are barricaded from some learners.

Implications for Practice: Broader economic, political and social issues are at play beyond access when technology is integrated into communities, in this case elementary classrooms. Varied technology usage contributes to social inequalities (Attewell, 2001; Barzilai-Nahon, 2006, DiMaggio, Hargittai, Celeste & Shafer, 2004; Hargittai, 2004; Korupp & Szydlik, 2005; Livingstone & Helsper, 2007; Norris, 2001; Ono & Zavodny, 2007; Selwyn, 2004; van Dijk, 2005; Warschauer, 2003; Zillien & Hargittai, 2009). Notably, when technology is utilized to facilitate human connections the digital usage inhibits or enhances the production of knowledge (Warschauer, 2010).

Therefore, "what is most important about ICTs is not so much the availability of the computing device or the Internet line, but rather people's ability to make use of that device and line to engage in meaningful social practices, specifically to communicate with people, to access information, and to publish information" (Warschauer, 2010, p. 7). Indeed, placing social aspects of digital usage is a move towards digital inclusion. At the same time, crucial gaps remain in the digital divide as a move beyond a binary notion (either/or, haves/have nots) towards a means of social inclusion, particularly in the context of elementary education. Accordingly, this study will bring scholarship on the participatory technology integration and the digital divide to bear on equity focused technology integration teacher beliefs and practices to explore what is produced in elementary education.

Purpose of the Study: In this qualitative research study I will consider, explore, and theorize potential productions of the phenomenon of pursuing more equitable technology integration. Accordingly, exploring conceptions of the digital divide is one way to unpack the relationship between people and their use of digital tools within schools. The broad purpose of this study is to explore the greater social issue of equity at play within technology integration practices in elementary education. Specifically, this post-intentional phenomenological study aims to better understand technology integration in concert with equity work in elementary education.

A greater understanding of technology integration equity work in elementary education may lead to the following advancements in the field:

- Generating an awareness of how social issues, equity and technology integration intersect in elementary education
- Identifying themes that produce change in beliefs and practices of elementary educators' equity work through technology integration
- Describing how lived experiences take shape for in-service teachers disrupting inequitable technology integration practices
- Addressing the ways beliefs intersect and produce technology integration pedagogies and practices in in-service teacher professional learning

What does this research mean for me, for my learners, for my schools community, and for the field of education?

The intent of the professional learning cohort is to provide time and space for you to explore and speak freely about your experiences related to (1) equity work in education and (2) teaching and learning with technology. This benefits educators who may not otherwise have time and space to learn about the topics, process their thinking, consider applications to their teaching practices and implications for student learning opportunities.

The intent of the interview is to provide time and space for you to speak freely about your experiences related to (1) equity work in education and (2) teaching and learning with technology. Further, the reflection opportunities incorporated into the interview fosters an opportunity for you to deeply process your thinking and draw connections to your teaching practices, learners, school community and the education field. This benefits educators who may not otherwise have time and space to explore connections across the topics, process their thinking, consider applications to their teaching practices and implications for student learning opportunities.

Additionally, the experience of participating in this research will allow you to build upon the ongoing equity work happening in education and position technology integration – how you use technology for teaching and learning – as an opportunity to pursue social change.

How long will this research last?

You have been invited to participate in a research study that includes 3 phases: a professional learning cohort, a 1:1 interview, and interview follow-up (if applicable) focused on equity and technology integration in elementary education. You can expect that you will be in this research study for a maximum of 9 hours of direct contact time with the researcher. This includes:

Professional Learning Cohort

- Cohort meeting between November 2017-January 2018
- Cohort meetings will be scheduled on mutually agreed upon dates and times
- Maximum of 7.5 hours

Interview

- One 1:1 interview with the researcher between December 2017-January 2018
- Maximum of 1 hour

Interview Follow-Up

- Interview follow-up between January 2018-May 2018
- Maximum of 30 minutes (if applicable)

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What happens if I say, "Yes, I want to be in this research?"

General:

- You have expressed interest in participating
- You have had a follow-up conversation with the researcher, Tiffany Nielsen-Winkelman, to discuss the purpose of the research, your duties and this consent form. You have had an opportunity to ask questions and receive clarification about this study.
- Should you opt to participate, you will provide informed consent by signing and returning this form to Tiffany Nielsen-Winkelman within 2 weeks.
- You will be part of a community of 3-7 teachers (maximum of 10) in this research study.
- You will be compensated with a $200.00 Visa gift card for your participation at the conclusion of the interview.
- This research will occur at a mutually agreed upon site that is conducive to you feeling relaxed and comfortable.
- Professional learning cohort meetings, the interview and the interview follow-up will occur at mutually agreed upon dates and times.

Please Note:

- Participation is voluntary.
- Participation is in no way tied to your employment, nor will participation or non-participation have negative consequences (e.g. disclosure of stigmatizing information; connection to seniority, promotion or tenure; etc.).
- You may ask additional questions or express concerns at any time to the researcher or faculty advisors.
- You may withdraw at any time, without consequence, in which case compensation will be prorated.
- Your participation incorporates a maximum of 9 hours of direct contact time with the researcher across the three components of this research study (professional learning cohort, interview, interview follow-up).
- The protection of your data is important. Please see the section "What happens to the information collected for this research?" section below for specific plans that are in place to ensure your protection and ethical research practices.

Professional Learning Cohort

- You will interact with the researcher and fellow participants as we explore the more equitable technology integration together.
- Together the professional learning cohort will collaborate to select topics and activities. Some topics may include:
  - digital divide
  - digital usage divide
  - participatory technology integration
  - race, social class and gender in the classroom
  - anti-bias education
  - ICT for social justice
  - technology integration beliefs and practices
- Cohort meetings will include semi-structured discussions and activities.
- Cohort meetings will provide time and space for you to explore (1) equity work in education and (2) teaching and learning with technology.
- In the cohort meetings you may opt to collectively or individually create an artifact to aide or communicate their understanding and experiences (e.g. such as lists, drawings, writings, videos, anchor charts, journal entries, visual representations, images, etc.).
- As a learning community you may opt to collectively or individually participate in shared readings/media, virtual discussions, journaling, artifact creation and sharing in the time between cohort meetings.
- Cohort meetings will be audio and video recorded. These recordings will be transcribed.

Interview

- You will interact 1:1 with the researcher as we explore the more equitable technology integration together.
- You may decide to share an artifact from your teaching or reflective practice in the interview. This is optional and determined by you.
- Interviews will be structured as conversational to explore your experiences being engaged in equity work around technology integration and your reflections.
- Interview will be audio and video recorded. These recordings will be transcribed.

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- You will interact 1:1 with the researcher as we explore the more equitable technology integration together.
- Informal follow-up to clarify any statements made in the interview or professional learning cohort to ensure accurate representations and identify any evolution of thinking that may have occurred since the professional learning cohort. (email, phone, Skype, face-to-face)

What happens if I do not want to be in this research?

You will contact the researcher, Tiffany Nielsen-Winkelman, and notify her that you are opting not to participate in the research.

What happens if I say "Yes", but change my mind later?

You can leave the research at any time and it will not be held against you. You will notify the researcher, Tiffany Nielsen-Winkelman, that you wish to change your consent to participate in the research.

If you decide to leave the research, your compensation will be prorated based upon amount of participation in the research study. Additionally, you and the researcher will determine what will happen to data collected up to the point of withdrawal and follow up with a notification in writing signed by both parties.

Is there any way being in this study could be bad for me?

While these types of conversations and self-reflection around equity are already occurring in schools, the research study procedures identified above will occur in a more focused manner and directly explore the intersections of equity and technology integration solely for the purposes of this study. With that, there is a minimal risk in the research study.

As with any equity-focused work, you may find some of the questions/discussions about your teaching experiences and personal beliefs to be sensitive, disarming and/or cause discomfort. This direct and candid conversation about inequitable social structures and how that impacts the work of teachers, especially in respect to how you integrate technology in your classrooms, may be a challenging and uncomfortable form of self-reflection. As you explore topics and self-reflection you may find tension in your perceived identify and actual educational practices. Thus, this equity work may be a challenging experience, yet productive, in the your professional learning and growth.

As a learning community we will attempt to process these discoveries and feelings. However, in the event you experience this minimal risk and feel uncomfortable, you may opt out of the question/discussion at any time without consequence. For your safety and well-being you will be reminded by the researcher of your right to opt out in each cohort meeting, the interview and interview follow-up. In addition, regular check-ins by the researcher will occur to support you and minimize risks of discomfort in order to ensure your safety and well-being.

Inconveniences related to this research have been reduced as much as possible by hosting the professional learning cohort meetings and interviews at a mutually agreed upon location (in private spaces so you may speak freely). Efforts will be made to reduce travel time, parking hassles, conflicts with childcare, etc. We will work collectively to determine a convenient and accessible location (e.g. private room in a library, coffee shop, local park).

Inconvenience of professional learning cohort dates and interview scheduling will be minimized by locating mutually agreed upon dates, spaces and time for scheduled meetings.

Will being in this study help me in any way?

I cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include opportunities for learning, self-reflection and professional growth. You will have time and space to learning about equity and technology integration topics, process your thinking, consider applications to your teaching practice and implications for student learning opportunities. You will earn a $200.00 Visa gift card, outside of your contracted teaching salary, for participation in this free professional growth opportunity.

What happens to the information collected for the research?

Efforts will be made to limit the use and disclosure of your personal information, including research study records, to people who have a need to review this information. We cannot promise complete secrecy. Organizations that may inspect and copy your information include the IRB and other representatives of this institution. An exception to our promise of confidentiality is when we in good faith are permitted by law or policy to report evidence of child abuse or neglect as Mandatory Reporters.

Further, the protection of your data is important and the following plans are in place to ensure ethical research practice:

- All data materials will be anonymized and identifying features will be removed, where this is not possible pseudonyms chosen by you will be used to code the secured data.
- Visual images, if any, with identifiable information will be blurred for your protection. The original visual images will be in a sealed envelope and stored in the locked file cabinet.
- All data collected will be secured on a private and password protected device and backed up on a password protected external hard drive.
- Items held in online platforms (Google Drive) will remain password protected and stored online.
- Physical consent forms, the researcher's journals, and identifying materials (although limited) will be stored in a locked file cabinet.
- Pseudonym and identifying information alignment will be maintained in a password-protected document on a password-protected computer.
- Only the researcher will have access to the data.
- The data will be stored in secure locations for 5 years after the conclusion of the study.
- The researcher will honor any additional requests you make regarding privacy.
- The researcher will not have access to medical, student, or employee records. No data will not be placed in the your records (e.g. medical, employment, educational).
- The researcher will not have access to any other sources of private information about you.

Can I be removed from the research without giving my OK?

The person in charge of the research study or the sponsor can remove you from the research study without your approval. The only circumstance in which you will be withdrawn by the researcher is the lack of attendance across multiple meetings (professional learning cohort or interview). In the event a participation concern occurs, the researcher will have a private conversation with you and follow up with a notification in writing to be signed by both parties. Your compensation will be prorated based upon attendance up to the date of withdrawal.

Will I be compensated for my participation?

If you agree to take part in this research study, you will be paid with a $200.00 Visa gift card for your time and effort at the conclusion of your interview.

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Will I have a chance to provide feedback after the study is over?

The Human Research Protection Program may ask you to complete a survey that asks about your experience as a research participant. You do not have to complete the survey if you do not want to. If you do choose to complete the survey, your responses will be anonymous.

If you are not asked to complete a survey, but you would like to share feedback, please contact the study team or the Human Research Protection Program (HRPP). See the "Who Can I Talk To?" section of this form for study team and HRPP contact information.

Research Consent

Your signature below documents your informed consent and permission to take part in this research. With this signature you are consenting to participation in the professional learning cohort and interview. You will allow the researcher to utilize the data collected in the professional learning cohort, interview and interview follow-up (if applicable).

_____   _____

Signature of participant   Date

_____

Printed name of participant

_____   _____

Signature of person obtaining consent   Date

Tiffany Nielsen-Winkelman_____

Printed name of person obtaining consent

**Please return this consent form to Tiffany Nielsen-Winkelman
via email at niels561@umn.edu
within two weeks of your interest conversation.**

Appendix D: Research Questions and Phenomenological Materials Alignment

#	Primary Post-Intentional Phenomenological Research Question	Phenomenological Materials
	Phenomenon: Pursuit of more equitable technology integration	
1	Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?	Primary: ● Participants' cohort artifacts ● Interviews Secondary: ● Researcher's cohort artifacts ● Researcher's post-reflexivity journal ● Participant follow-up
#	**Supporting Post-Intentional Phenomenological Research Questions**	**Phenomenological Materials**
2	What are some of the underlying technology integration beliefs and practices at work, if any?	Primary: ● Participants' cohort artifacts ● Participant follow-up Secondary: ● Interviews ● Researcher's post-reflexivity journal ● Researcher's cohort artifacts
3	In what ways, if any, do the lived experiences of in-service educators evolve throughout involvement in professional learning experiences?	Primary: ● Interviews Secondary: ● Researcher's post-reflexivity journal ● Participant follow-up ● Participants' cohort artifacts ● Researcher's cohort artifacts

Appendix E: Phenomenological Materials Details

Phenomenological materials were used to consider, explore and theorize potential productions and provocations of the phenomenon.	
Phenomenological Material	**Phenomenological Material Details**
Participants' cohort artifacts (3 meetings)	- Cohort creations and image documentation (participant/cohort initiated creation of product(s) such as lists, drawings, videos, anchor charts, etc.) - Participant journals (Notebook: lived experience written reflections, notes, drawings, representations, chronicling, lists, drawings; Virtual: lived experience video and audio reflections via Flipgrid) - Cohort artifact sharing (from teaching or reflective practice) was optional. - Ongoing cohort professional learning artifacts (participants opted to individually/collectively participate in shared readings/media, virtual discussions, journaling, artifact creation, artifact sharing in the time between cohort gatherings) This data provided insights into the lived experience of engaging in technology integration professional learning and self-reflection anchored in equity. The cohort gatherings provided space and reflection opportunities to explore how the phenomenon was produced and/or provoked in the participants' identities, pedagogies/practices, language in use, social justice commitments, social practices, and critical lenses. Cohort gatherings were primarily semi-structured discussions and activities regarding the phenomenon. They opened with a post-intentional phenomenological question (e.g. What has it been like to reflect on your technology integration practices?). At times participants opted to collectively or individually create artifacts to aide or communicate their understandings and experiences. Cohort phenomenological materials were used to explore instances that produced and/or provoked the phenomenon by

	providing access points to understand the participants' lived experiences as they engaged in critical self-reflections related to (1) equity work in education and (2) teaching and learning with technology.
Researcher's cohort artifacts (3 meetings)	- Cohort discussion and activity audio recordings and transcriptions - Cohort discussion and activity video recordings and transcriptions - Cohort discussion and activity image documentation - Cohort materials: - Website (resource hub for presentation materials, readings and media, cohort gathering details, contact information, etc.) - Slides - Handouts - Readings - Media - Agendas - discussion prompts (e.g. technology access and usage identification; technology integration experiences drawing and quick writes; "who I am…" identity representation; living in and through the 3Ps; digital divide/participatory technology integration reflection; vision for my learners; vision for technology integration, etc.) - etc. - Cohort field notes This data served as an initial grounding for technology integration professional learning and critical self-reflection anchored in equity as they were introduced to and experienced by the participants. Ongoing post-reflexing and analysis explored how these relations and intentionalities may have sparked the production and/or provocations in and through the phenomenon.
Interviews (1 interview)	- Interview audio recordings and transcriptions - Interview recordings - Interview artifact image documentation (artifact selected by teacher from teaching or reflective practice and shared in interview) - optional, determined by

	participant ● Interview protocol ● Interview prompts ● Interview field notes This research employed the 'interview as a social practice' (Talmy, 2011) stance and treated the interview as a social practice that problematized assumptions and facilitated analyzing the 'whats', 'whys' and 'hows' as a source of knowledge production. The interviews provided space and reflection opportunities to explore how the phenomenon is produced and/or provoked in their beliefs, pedagogies/practices, language in use, equity commitments, social practices, and critical lenses. This phenomenological material was used to explore instances that produced and/or provoked the phenomenon by providing access points to understand the individual participants' lived experiences as they engaged in critical self-reflections related to (1) equity work in education and (2) teaching and learning with technology.
Participant follow-up (varied, ongoing)	● Follow-up inquiries ● Follow-up correspondence (e-mail, phone, letters, Flipgrid videos, etc.) ● Follow-up field notes ● Follow-up audio recordings and transcriptions ● Follow-up recordings ● Follow-up artifact image documentation This phenomenological material provided opportunities to clarify statements made in the interview, or other phenomenological materials. Additionally, this phenomenological material explored any evolution of thinking that may have occurred since the professional learning cohort gatherings. Participants were given an opportunity to ensure accurate representations and note shifts in their productions and/or provocations of the phenomenon.
Researcher's	● Weekly post-reflexivity journal entries (written

post-reflexivity journal (ongoing)	reflections, notes, drawings, representations, chronicling, lists, drawings, anchor charts, quotes, wonderings) ● Voice memos ● Post-reflexion on phenomenological materials analysis This phenomenological material provided a consistent interrogation of the researcher's pre-understandings to explore personal experiences as they related to the phenomenon during planning, delivery, phenomenological material collection and phenomenological material analysis. Post-reflexivity journal entries noted moments of intrigue, perplexion or shock. Post-intentional phenomenologists utilize this space to question knowledge, beliefs and/or assumptions that frame experiences, assumptions and bottom line commitments regarding the phenomenon. Post-intentional phenomenology highlights this practice as an essential element in the research process. This post-reflexing was used as a collection to continuously revisit.

Appendix F: Professional Learning Cohort #1

Centering Quote:

Technology is not neutral. We're inside of what we make, and it's inside of us. We're living in a world of connections - and it matters which ones get made and unmade. - Donna Haraway

Professional Learning Experiences:
- Welcome & Housekeeping
- Opening Reflection
- What is normal? Identity -isms
- Technology Journal
- Digging for Definitions - Building Common Language & Collective Knowledge
- Shared Readings
- Reflections & Thinking Forward
- Closing & Invitation for Ongoing Engagement

Literature & Media:

Professional learning experiences were informed by and/or incorporated the following literature:

- Caldwell, M., & Frame, O. (2017). *Let's Get Real: Exploring Race, Class, and Gender Identities in the Classroom*. New York, NY: Routledge.
- EA, Prince. [Username]. (2016, September 26). *I just sued the school system.* [Video file]. Retrieved from: https://youtu.be/dqTTojTija8
- Jones, S. (2006). *Girls, social class, and literacy: What teachers can do to make a difference*. Portsmouth, NH: Heinemann Educational Books.
- Kissinger, K. (2017). *Anti-Bias Education in the Early Childhood Classroom: Hand in Hand, Step by Step*. New York, NY: Routledge.
- Miller, Becker & Becker. (Eds.). (2016). *Technology for Transformation: Perspectives of hope in the digital age*. Charlotte, NC: Information Age Publishing.
- Mun Wah, L. (2004). *The Art of Mindful Facilitation*. Berkeley, CA: StirFry Seminars & Consulting.
- Reinhart, J. M., Thomas, E., & Toriskie, J. M. (2011). K-12 teachers: Technology use and the second level digital divide. *Journal of Instructional Psychology*, *38*(3/4), 181-193.
- Seale, J. (2010). *Digital inclusion: A research briefing by the technology-enhanced learning phase of the teaching and learning research programme* (London Knowledge Lab Publication). London, UK. Retrieved from: http://www.tlrp. org/docs/DigitalInclusion. pdf.
- Vrasidas, Zembylas & Glass. (Eds.). (2009). *ICT for education, development, and social justice*. Charlotte, NC: Information Age Publishing.
- Warschauer, M. (2003). Demystifying the digital divide. *Scientific American. 289*(2), 42-47.
- Warschauer, M. (2007). A teacher's place in the digital divide. *Yearbook of the National Society for the Study of Education*, *106*(2), 147-166.
- Warschauer, M. (2011). A literacy approach to the digital divide. In M.A. Pereyra (Ed.), *Las mulialfabetizaciones en el espacio digital. Malaga, Spain: Ediciones Aljibe*. 1-40.
- Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, *34*(1), 179-225.

Appendix G: Professional Learning Cohort #2

Centering Concepts:

1. *Social exclusion is the utmost form of marginalization.* - Author unknown
2. *While public debates about the digital divide centers on basic technology access, the gap is even wider when measured by the pedagogical practices associated with technology use in different schools. Schools serving students living in poverty tend to use technology for more traditional memory-based and remedial activities, while schools serving wealthier communities are more likely to focus on communication and expression. A nationwide study examining the relationship between socioeconomic status and teaching practices around technology found that teaching in low-SES schools correlated most strongly with using technology for "reinforcement of skills" and "remediation of skills," while teaching in higher-SES schools correlated most with "analyzing information" and "presenting information to an audience".* - Becker (2000)
3. *Our work is not to leave the world's inequities where they are, but rather teach students to understand how systems of power and privilege work, to recognize and critique them, to question and confront their effects.* - Bomer & Bomer (2006)

Professional Learning Experiences:

- Welcome & Housekeeping
- Digital Inclusion
- Inquiry into Social Class
- Technology Integration Frameworks/Models
- Digital Divides
- Critical Oriented Thinking and Practice
- Cohort Challenge: Technology Tool Exploration
- Reflections & Thinking Forward
- Closing & Invitation for Ongoing Engagement

Literature & Media:

Professional learning experiences were informed by and/or incorporated the following literature:

- Becker, H.J. (2000). Who's wired and who's not: Children's access to and use of computer technology. *Future of Children. 10(2),* 44-75. Los Altos, CA: The David and Lucile Packard Foundation. Retrieved charts from: http://www.gse.uci.edu/doehome/DeptInfo/Faculty/Becker/packard/saveall.html#top.
- Bishop, R. S. (1990). Mirrors, windows, and sliding glass doors. *Perspectives*, *6*(3), ix-xi.
- Caldwell, M., & Frame, O. (2017). *Let's Get Real: Exploring Race, Class, and Gender Identities in the Classroom*. New York, NY: Routledge.
- Darling-Hammond, L., Zielezinski, M. B., & Goldman, S. (2014). Using technology to support at-risk students' learning. *Stanford Center for Opportunity Policy in Education*. Retrieved from: https://edpolicy.stanford.edu/sites/default/files/scope-pub-using-technology-report.pdf
- Derman-Sparks, L. (2016, April 14). *Guide for selecting anti-bias children's books*. Teaching for change: Building social justice starting in the classroom. [Website]. Retrieved from: http://www.teachingforchange.org/selecting-anti-bias-books
- Elliotzetta. [Username]. (2016, August 28). *Decolonizing the imagination of Black children*. [Video file]. Retrieved from: https://youtu.be/h1kNC473vTU
- Hernandez, M. (2015, September, 16). Empowering students through multimedia storytelling. *Edutopia*. Retrieved from: https://www.edutopia.org/blog/empowering-students-through-multimedia-storytelling-michael-hernandez
- Jones, S. (2006). *Girls, social class, and literacy: What teachers can do to make a difference*. Portsmouth, NH: Heinemann Educational Books.

- Kay, K., & Honey, M. (2005). Beyond technology competency: A vision of ICT literacy to prepare students for the 21st century. *The Institute for the Advancement of Emerging Technologies in Education.* Charleston, WV: Evantia.
- Kissinger, K. (2017). *Anti-Bias Education in the Early Childhood Classroom: Hand in Hand, Step by Step*. New York, NY: Routledge.
- Mantsios, G. (2004). Media Magic. In Rothenberg, P.S. (Eds.), *Race, class and gender in the United States: An integrated study.* (193-207). Basingstoke, UK: Macmillan.
- Miller, Becker & Becker. (Eds.). (2016). *Technology for Transformation: Perspectives of hope in the digital age*. Charlotte, NC: Information Age Publishing.
- MotoVike Films. [Username]. Teach Us All. [Documentary Trailer, Video file]. Retrieved from: https://youtu.be/I5hE2Xm_dDQ
- Mun Wah, L. (2004). *The Art of Mindful Facilitation*. Berkeley, CA: StirFry Seminars & Consulting.
- Newman, D. M. (2018). The architecture of stratification: Social class and inequality. In *Sociology: Exploring the architecture of everyday life*. Thousand Oaks, CA: Sage Publications.
- Reading Rockets. [Username]. (2015, January 30). *Mirrors, windows and sliding glass doors - an interview with Dr. Rudine Sims Bishop*. [Video file]. Retrieved from: https://youtu.be/_AAu58SNSyc
- Resources for closing the digital divide. [Website]. (2016, June 21). Retrieved from: https://www.edutopia.org/digital-divide-technology-access-resources
- Teach Us All: Social Action Toolkit. (2017). Retrieved from: https://static1.squarespace.com/static/5724e569b09f951c90c9c390/t/59c15c758419c24d5e1dd606/1505844345973/TEACH+US+ALL+-+Social+Action+Toolkit+%28Final%29.pdf
- TEDx Talks. [Username]. *The Windows and mirrors of your child's bookshelf with Grace Lin*. [Video file]. Retrieved from: https://youtu.be/_wQ8wiV3FVo
- Vrasidas, Zembylas & Glass. (Eds.). (2009). *ICT for education, development, and social justice*. Charlotte, NC: Information Age Publishing.
- Without a net: The digital divide in America. [Video Documentary]. (2017). Kennedy, R. (Director, Producer). Retrieved from: http://www.digitaldivide.com/
- Zielezinski, M. (2016, May 19). What a decade of education research tells us about technology in the hands of underserved students. *EdSurge*. Retrieved from: https://www.edsurge.com/news/2016-05-19-what-a-decade-of-education-research-tells-us-about-technology-in-the-hands-of-underserved-students

Appendix H: Professional Learning Cohort #3

Centering Quote:

There is no real ending. It's just the place where you stop the story. - Frank Herbert

Professional Learning Experiences:

- Welcome & Housekeeping
- Opening
- Digital Inclusion Reflection
- Social Divides Concept Synthesizing: Group, Label & Share
- My Journey
- The Lie
- {Re}imagine Teaching & Learning
- Learning Artifact Gathering
- Reflections & Thinking Forward
- Closing & Invitation for Ongoing Engagement

Literature & Media:

Professional learning experiences were informed by and/or incorporated the following literature:

- Ahmed, S. (2012). *On being included: Racism and diversity in institutional life*. Durham, NC: Duke University Press.
- Anderson, M. (2017, March 22). Digital divide persists even as lower-income Americans make gains in tech adoption. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2017/03/22/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/
- Armfield, A.W.J. (2016). Questioning technology integration. In Miller, Becker & Becker. (Eds.). *Technology for transformation: Perspectives of hope in the digital age*. (107-122). Charlotte, NC: Information Age Publishing.
- Caldwell, M., & Frame, O. (2017). *Let's Get Real: Exploring Race, Class, and Gender Identities in the Classroom*. New York, NY: Routledge.
- Horrigan, J. (2015, April 15). The numbers behind the broadband 'homework gap'. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2015/04/20/the-numbers-behind-the-broadband-homework-gap/
- Horrigan, J. (2016, September 20). Digital readiness gaps. *PEW Research Center*. Retrieved from: http://www.pewinternet.org/2016/09/20/digital-readiness-gaps/
- Jones, S. (2006). *Girls, social class, and literacy: What teachers can do to make a difference*. Portsmouth, NH: Heinemann Educational Books.
- Kafai, Y. B., & Burke, Q. (2014). *Connected code: Why children need to learn programming*. Cambridge, MA: Mit Press.
- Kissinger, K. (2017). *Anti-Bias Education in the Early Childhood Classroom: Hand in Hand, Step by Step*. New York, NY: Routledge.
- Martinez, S. L., & Stager, G. (2013). *Invent to learn: Making, tinkering, and engineering in the classroom*. Torrance, CA: Constructing Modern Knowledge Press.
- Miller, Becker & Becker. (Eds.). (2016). *Technology for Transformation: Perspectives of hope in the digital age*. Charlotte, NC: Information Age Publishing.
- Mun Wah, L. (2004). *The Art of Mindful Facilitation*. Berkeley, CA: StirFry Seminars & Consulting.
- Perrin, A. (2017a, May 19). Digital gap between rural and non-rural America persists. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2017/05/19/digital-gap-between-rural-and-nonrural-america-persists/

- Perrin, A. (2017b, August 31). Smartphones help blacks, Hispanics bridge some – but not all – digital gaps with whites. *PEW Research Center*. Retrieved from: http://www.pewresearch.org/fact-tank/2017/08/31/smartphones-help-blacks-hispanics-bridge-some-but-not-all-digital-gaps-with-whites/
- Porfilio, B. (2016). Foreword in Miller, Becker & Becker. (Eds.). (2016). *Technology for Transformation: Perspectives of hope in the digital age*. Charlotte, NC: Information Age Publishing.
- Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013, February 28). How Teachers Are Using Technology at Home and in Their Classrooms. *PEW Research Center*. Retrieved from: http://www.pewinternet.org/2013/02/28/how-teachers-are-using-technology-at-home-and-in-their-classrooms/
- Rainie, L. & Anderson, J. (2017, May 3). The future of jobs and training. *PEW Research Center*. Retrieved from: http://www.pewinternet.org/2017/05/03/the-future-of-jobs-and-jobs-training/
- Tu, C-H., Yen, C-J., & Sujo-Montes, L. (2016). Network learning literacy. In Miller, Becker & Becker. (Eds.). *Technology for transformation: Perspectives of hope in the digital age*. (87-106). Charlotte, NC: Information Age Publishing.
- Tuck, E., & Yang, W. (Eds.). (2018). *Toward what justice?: Describing diverse dreams of justice in education*. New York, NY: Routledge.
- Untitled Productions. [Username, Producer]. (2016). The Lie. [Video file]. Pastor, K. (Director, Producer). Retrieved from: https://vimeo.com/182020903
- Vrasidas, Zembylas & Glass. (Eds.). (2009). *ICT for education, development, and social justice*. Charlotte, NC: Information Age Publishing.

I'm interviewing you today to learn more about your experiences pursuing more equitable technology integration as part of my doctoral dissertation research project. The intent of this conversational interview is to provide time and space for you to speak freely as we explore the experiences you have had around equity work in education and positioning technology integration - how you use technology for teaching and learning - as an opportunity to pursue social change.

Because you have agreed to participate in this study during the consent process you are familiar with this information, but I want to remind you that:
- your participation is voluntary
- your information will be held confidential
- the pseudonym you have chosen will be used to protect your identity
- you can stop at any time if you feel uncomfortable
- I do not intend to inflict any harm
- I may reach out this spring to (1) clarify any statements made, (2) to ensure accurate representations, and (3) explore any evolution in thinking and experiences that may have occurred since the professional learning cohort
- the findings from this study will be shared with my dissertation committee and published in my completed dissertation

To facilitate my note-taking, I would like to audio and video record our conversation today. The interview is planned to last no longer than 1 hour.

During our interview, please let me know if you want me to repeat or restate the question. If you do not wish to answer a question, you can just say, "I want to pass on the question." Also, the recorder may be turned off at any point, upon your request.

Do you have any questions before we begin the interview? [After answer questions or if no question]. Thank you for participating.

Phenomenon:
Pursuit of more equitable technology integration

Research Questions:
Primary research question:
- Given inequities in technology integration practices, how might the pursuit of more equitable technology integration take shape for elementary educators in a diverse school community?

Secondary research questions:
- What are some of the underlying technology integration beliefs and practices at work, if any?
- In what ways, if any, do the lived experiences of in-service educators evolve throughout involvement in professional learning conversations?

Appendix J: Interview Learning Artifact

Participants were invited via email in the confirmation of their interview to identify or create an artifact they felt represented their learning journey. The following artifact invitation was shared with participants via email during the interview confirmation process. The learning artifact was welcomed, but not required.

You may decide to share an artifact from your experiences. In my experiences conducting interviews, having an artifact to launch from is really helpful - and much more comfortable!

To refresh your memory, we have explored:
- identity
- what we deem as 'normal'
- technology use (self and learners)
- digital divides
- digital inclusion
- social class
- representation (in children's literature as an example of representation in curriculum and schooling practices)
- technology integration frames (affordances, RAT and SAMR)
- social participation
- experiences in our classrooms

The artifact may be:
- a representation of our work together
- an excerpt from an activity and/or your tech journal (or Flipgrid)
- an application of your professional learning cohort thinking and learning (photos, videos, anecdotal notes, student work samples, etc.)

Basically, whatever is meaningful to YOU and helps you articulate your experience(s) pursuing more equitable technology integration.

Helpful Hints:
- This artifact may represent when you noticed (experienced) a moment of intrigue, perplexion, shock, or an ah-ha.
- This artifact may represent when you noticed (experienced) a connection or disconnection with your teaching beliefs and/or practices.
- This artifact may represent when you noticed your assumptions, bottom line commitments, or teaching practices shaping how you understand your role, your classroom, your beliefs, your practices, your experiences, your feelings, etc..
- This artifact may represent when you noticed a solidification or evolution in your thinking, beliefs, and/or teaching practices.

Ultimately, the learning artifact is intended to help us explore what is it like to actively learn about the intersection of equity work and technology integration - how you experienced pursuing more equitable opportunities for your learners.

Appendix K: Interview Questions

The following interview questions were designed as a resource to launch the unstructured interview, should they be necessary. Questions were utilized to open up this particular phenomenon in its multiple, partial, and varied contexts. It is crucial to note that individual interviews with participants took shape in personalized ways and the following questions were referred to as a menu to foster discussion. I drew upon questions only as necessary in order to lean into reflective moments where the phenomenon was being produced or provoked and was producing and provoking something. These interview questions we intended to nurture reflexivity commitments, so we may "uncover underlying, shifting, changing knowledges that are at work in all intentional relations, and can begin to embrace post-structural arguments such as all-knowing being partial and fleeting" (Vagle, 2018, p. TBD).

Notably, in one interview only question one was utilized. Whereas in another interview one, four, five, eight and ten were woven in through the conversation driven by the participant's chosen learning artifact. I incorporated Interview Questions and Interview Probes (see Appendix L) solely to facilitate dialogue and explore the phenomenon, not to structure the conversation in a particular way.

1. Can you please tell me about your experience pursuing more equitable technology integration?
2. What is it like to actively learn about the intersection of equity work and technology integration?
   ○ Try describing the experience from the inside, as it were almost like a state of mind: the feelings, the mood, the emotions, how your body felt, how things sounded, etc.
3. What has it been like to think about underlying technology integration beliefs and practices at work in your school community and classroom?
4. How, if at all, did your experiences evolve throughout the involvement in professional learning conversations?
5. When did you notice a moment of intrigue? perplexion? shock? ah-ha?
   ○ Why might that be? Why might you feel that way?
6. When did you notice a moment of connection with your teaching beliefs and/or practices? disconnection with your teaching beliefs and/or practices?
   ○ Why might that be? Why might you feel that way?
7. What experiences/assumptions/bottom line commitments/practices might be shaping your understandings? experiences? feelings? Thinking?
8. How does this fit with your experience of how _____ works? (how the world works, how schools work, how learning happens, your role as an educator)
9. Tell me about a time you have experienced inequities in your classroom or school community.
   ○ Explain how you think our professional learning cohort experience has shaped your understanding or interpretation of that teaching experience.
10. Is there anything else you'd like to share with me about your experience pursuing more equitable technology integration?

Appendix L: Interview Probes

The following interview probes were designed as a resource to probe more deeply into a topic/concept/experience/belief/practice within the unstructured interview, should they be necessary. Probes were utilized only as necessary in order to lean into reflective moments where the phenomenon was being produced or provoked and was producing and provoking something. I incorporated Interview Questions (see Appendix K) and Interview Probes solely to facilitate dialogue and explore the phenomenon, not to structure the conversation in an particular way.

➔ Tell me more about…
➔ What makes you feel/think that?
➔ What in the _____ makes you feel/think that?
➔ How does this experience fit with…
➔ How is this experience similar to/different from…
➔ Tell me about the relationship between ____ and _____…
➔ I noticed you said/wrote/drew/reacted _____, can you share more about that?
➔ Explain how you think _____ shaped _____ experience.
➔ Why is ____ important?
➔ What might happen if…
➔ I'd like to understand…
➔ When did you notice a moment of intrigue? perplexion? shock? ah-ha?
➔ When did you notice a moment of connection with _____? disconnection with _____?
➔ Why might that be? Why might you feel that way?
➔ What experiences/assumptions/bottom line commitments/practices might be shaping your understandings? experiences? feelings? thinking?
➔ How does this fit with your experience of how _____ works? (the world, schools, learning)
➔ How does _____ relate to your experience of _____?
➔ Tell me about a time you have experienced _____.
➔ How has _____ affected your life? What kind of impact has _____ had on your life?
➔ Try describing the experience from the inside, as it were almost like a state of mind: the feelings, the mood, the emotions, how your body felt, how things sounded, etc..
➔ Would you explain further?
➔ Would you give me an example of what you mean?
➔ Would you say more?

Appendix M: Red Burns Inspired Poem (Author Unknown)

What I hope for you…

"That you combine that edgy mixture of self-confidence and doubt. That you think of technology as a verb - not a noun. [That you remember most technical issues can be resolved with patience, perseverance, and a sense of humor.] That you create opportunities to improvise. That you observe, imagine, and create. [That you feed your curiosity.] That you look for the question, not the solution. That you are not seduced by speed and power. That you don't see the world as a market, but rather as a place that people live in - you are designing for people, not machines. That you have a stake in the magic and mystery and art. That you understand the value of pictures, words, and critical thinking. That poetry drives you, not hardware. That you are willing to risk, make mistakes, and learn from failure. That you embrace the unexpected [and uncertainty]. That you value serendipity. That you listen. That you ask questions. That you speculate and experiment. That you play. That you are spontaneous. That you collaborate. That each day is magic for you. That you turn your thinking upside down. That you make whole pieces out of disparate parts. That you develop a moral compass. That you welcome loners, [newcomers, and the marginalized]. That you are flexible. That you are open. That you can laugh at yourself. That you are kind."

- Inspired by Red Burns, former NYU professor and researcher

What I hope for you is...

That you are **profoundly present** in an edgy mixture of **critical gaze** and **action**. That you think of **technology as a verb** - not a noun - as an extension of yourself to **engage** with and **improve the world**. That you see **social issues** as **social opportunities** to be conscientious and **wobble**. That you are **being and becoming** more equitable technology integrationists in ways that leave a mark on **your heart**. That you remember most social issues can be **productively addressed** with attention to assumptions, **intensities** and **problematizing** social systems and practices at work. That you **see differently**. That you create opportunities to **productively speculate**. That you feel the **in-between-ness** of **social change**. That you observe, imagine and create in the **entanglements** of using technology as a means of **unOthering**. That you **lean into tensions**. That you **productively disrupt** beliefs, practices and systems which marginalize learners. That you trust your **ways of knowing and being**. That you feed your curiosity with technology as **permeable** and **malleable** in their **relationship with humans**. That you look for the inequities in education - acknowledging the **digital divides** as persistent and pervasive - but **not inevitable**. That

you are not seduced by power and privilege. That you don't see technology integration beliefs, practices, pedagogies and professional learning as a static.

That you leverage the affordances of technology to participate in a global community. That you are driven by people, not hardware. That you are willing to use technology to produce disruptions in the status quo of education towards more equitable practices. That you slow down to remain open. That you construct and embody pluralistic ways of being an educator. That you play. That you create, connect, communicate and collaborate with technology. That you act with a sense of urgency in your classroom. That you strive to achieve technology use homeostasis in your ecosystem. That then, as each other's keepers, you wobble the ecosystem with further questioning of societal implications. That you love your learners well. That you are the guardian of humanity through uses of technology in your classroom community. That you take up the pursuit of more equitable technology integration.

Written by: Tiffany Nielsen-Winkelman
Inspired by:
Red Burns,
the phenomenon of pursuing more equitable technology integration
and the wonderful elementary educators who participated in this research