U.S. HISTORY CURRICULUM PROJECT USING BLENDED LEARNING TO IMPROVE FORMATIVE FEEDBACK

by

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Abstract

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This capstone project leverages a 1:1 device classroom setting to create opportunities for effective teacher-to-student formative feedback. Classroom feedback is complex and proven effective but the practice of giving excellent feedback is rare, even for the most dedicated K-12 teachers. The implementation of effective feedback is rare but there is significant and specific research that identifies important characteristics and formats for offering effective formative feedback. A 1:1 classroom using blended learning offers opportunities to implement excellent feedback practices by allowing teachers more time for conversation with small groups of students. The curriculum project is a unit long exploration of traditionally marginalized groups pushing for access to their civil rights in post-WWII United States. The unit uses research supported techniques to include an on-boarding of digital literacy skills that helps improve students' skill set before assigning complex assessments.

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CHAPTER ONE

Introduction

Background

The roles of athletic coach and classroom teacher are two different roles that mirror many of the same skills. Both roles involve education, and at their best, both roles aim to improve the lives of others. At the bedrock of both classroom teaching and athletic coaching is giving others information about how to change their behavior or an outcome, in other words, feedback. This process is much more complex than it may sound. It's not enough just to tell someone they've made a mistake and remind them of the desired outcome. It is easy to snicker at an inexperienced or overly emotional coach whose attempts to give feedback by screaming at a struggling team to "try harder!" or to "stop number twenty one!" on the other team. This sort of feedback is unlikely to improve players' performance. A mark of an excellent coach is often one who yells less and works to give athletes feedback that is specific and actionable so they can improve their play on the field. Like coaches, classroom teachers often struggle to find ways to communicate feedback to students in a way that measurably improves students' learning outcomes as well.

Classroom teachers do not yell, "get the correct answer!" at students to improve outcomes, but some studies show it is still very unlikely that students will hear or see any type of quality feedback at all (Hattie & Timperley, 2007). This capstone is based on the power of feedback, the challenge to implement effective feedback, and finding ways to support teachers' efforts to improve feedback without over-burdening teacher workload by asking the question:

how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?

Teaching and coaching, like all aspects of life, are being radically affected by technology. Coaches today have the ability to choose any moment from the previous night's game, draw the path on the screen that a player should have taken, and then send it directly to that player who can watch it all on his or her phone. This type of specific, individualized feedback can have a big impact on an athlete's understanding of strengths, weaknesses, and opportunities to improve. Just as athletic coaches are using technology to give specific feedback, it is even more important that teachers find ways to harness technology in their classrooms in order to give better feedback.

This capstone creates a curriculum project that uses research on feedback types to improve the quality of feedback given and technology integration to create more consistent opportunities for teachers to give quality feedback. Chapter one explores how and why a focus on feedback and technology integration have become important to my classroom practice. Tied with this initial personal story is an introduction into the research regarding feedback in the classroom that is explored more deeply in chapter two. Next, chapter one outlines the way in which technology can be a tool to facilitate better feedback in classrooms. Finally, this chapter discusses how the broader educational community is invested in the ideas of this capstone along with previewing the rest of the capstone.

Origin Story

During the mid 2010s I began to notice that many educational communities that I trusted locally and nationally were focusing directly or indirectly on ways to provide feedback to students. Colleagues I respected and worked with regularly, as well as articles and tweets that I

saw on social media, were all deeply reflecting on how to communicate with students about their successes and the opportunities for growth using everything from single point rubrics to standards-based grading. As I looked more deeply into these questions it was clear the educational research community was focused on feedback too.

Studies by Hattie and Timperley (2007) and others fleshed out the idea that feedback is highly complex and can be very beneficial to student achievement. Ultimately it was some local leadership and professional development that pushed me to explore feedback more diligently. I hold The Director of Learning at South Saint Paul Schools (District #6) Dr. Chad Schmidt in high regard and he has pushed to instill a focus on feedback in the South Saint Paul School District by using the phrase, "The learning is in the conversation" (personal communication, August 27, 2016). This mantra has helped remind me of the dynamic, back-and-forth nature of education. I have never been a purely *stand and deliver* type of educator, but the phrase *learning is in the conversation* is an insistent reminder of the personal and the powerful role communication, which is ultimately feedback, plays in the classroom. This capstone's focus is in many ways a response to Dr. Schmidt's challenge that teachers reexamine what they are saying to students and whether it is helping them learn, or not.

As I was challenged and encouraged by the example of colleagues both near and far to reflect on the idea of feedback as an essential tenet of the learning process, I began to understand just how much feedback should steer teaching decisions. If I believed U.S. History content was worth studying, and the academic skills of reading, writing, and synthesis were important for students development, what was I telling students on an individual level that encouraged and improved their knowledge and skills? Certainly a grade or score alone was not enough to

improve students' understanding of history or their ability to craft a sound argument. If I didn't find ways to give students feedback that helped them improve, I was remaining silent during an enormous part of the conversation that was supposedly taking place in my classroom. One of my primary goals as a classroom teacher is that students improve their knowledge and skills while working with me. Developing appropriate assessments and practice helps focus student work, and summative grading informs students to what extent they achieved stated learning objectives, but feedback given during the learning process offers a direct and effective way to impact student growth and improvement. As I reflected on my classroom practice, it became clear that feedback was present but was not central to my practice to the extent that is necessary to honestly claim that student growth and improvement is a primary goal of my classroom practice. In order to make changes to my classroom feedback process, I needed to find researched techniques and strategies to adopt.

Chapter 2 examines academic research on the complexity of and strategies for offering excellent classroom feedback. One of the most basic ways to describe feedback is to use two terms; formative and summative. Formative feedback is described by Méndez and Tirado as information that "enables teachers to provide feedback to students during the learning process" (2016, p.189). Conversely, summative feedback is given after a student has completed a learning objective. Both types of feedback play an important role in improving student achievement. The initial seeds of this capstone are found in my attempt to improve summative feedback.

First steps. My first attempt at a more intentional feedback model in my classroom was to increase in the speed with which I gave students summative feedback on assessments. Mastropieri and Scruggs' (1994) research showed the speed in which students get feedback from

teachers plays a significant role in how useful it is to their achievement. While I had not deeply researched quality feedback, I sensed that simply rushing through grading in order to give students feedback sooner was not going to prove that beneficial, so I needed to find another aspect of the feedback cycle that I could speed up. I recognized that when I typed my feedback I was more efficient than when I hand wrote feedback. Because of my comfort in typing my thoughts out and also technology offered the ability to utilize a set of universal comments that could be copied and pasted to notify students of frequent, similar errors to further speed up the process of giving feedback. Integration of a learning management system (LMS) such as Google Classroom made this goal fairly straightforward. LMSs continue to improve the workflow of giving feedback. Migration of most of my coursework onto a LMS seemed to decrease the time it took me to get students feedback on their work. This initial, tiny foray into a more deliberate feedback practice in my classroom felt successful, but without rigorous data collection or further research it opened up more questions to be answered. For example, was it better to focus on summative feedback or formative feedback? Was verbal feedback more effective than written feedback? Exactly how quickly does feedback need to be given in order to maximize its useful? While the questions persisted after my initial attempt at intentional feedback, the one takeaway I felt confident in was that technology would be one of the most effective tools to manage any significant changes to my classroom structure.

My initial attempts to improve summative classroom feedback by using an LMS triggered deeper reflection that pushed me toward reimagining the impact of formative feedback. This turn toward formative feedback was triggered by the feedback I was receiving from students in class. I frequently notice that when I invite students to open a completed assessment that I

have given summative feedback on, many students go straight to the online gradebook so they could see the score they earned, rather than look at the assessment itself and my feedback. Some students certainly read the feedback I gave and used it as a jumping off point for thoughtful reflection, but I have been unable to inspire every single one of my students to see each assessment as an opportunity to unlock their innate desire to learn and improve. Many students were satisfied to know what they scored on the assessment and move on to the next task. While this sort of discussion is an obvious avenue to reimagining grading practices and reflecting on the purpose of high school in general, my work on this capstone is a decidedly more measured step. Certainly some students have unlocked their own intrinsic desire to learn but more students are interested merely in scoring what they deem an acceptable grade. In order to reach the widest audience of students, I should focus on formative feedback during the learning process itself when a higher percentage of students are directly engaged in their work. Even students who are still learning to unlock their intrinsic motivation to learn are interested in earning credit for the course and formative feedback can make that process easier for them. This desire to give meaningful feedback that the highest percentage of students will act on made the focus on formative feedback an early and important decision for this capstone.

This capstone began with the realization that my classroom structure did not maximize opportunities to provide students with excellent feedback. I believed that a failure to give regular, excellent feedback was driving a wedge between students and the learning process that I could minimize. While the desire to improve feedback to each student was real, the idea of having thoughtful conversations with 140 students every day or week can seem insurmountable without help. Technology is a tool that can help facilitate more frequent and more quality conversations

with students. I knew that my early efforts to minimally improve summative feedback in class was aided by technology, and I hoped it would help with a broader structural reform focused on formative feedback. The following section begins to explore how technology can be leveraged in order to improve classroom formative feedback.

Levels of Technology Implementation

From the technology of stationary agriculture to the creation of the internet, human technological inventions have caused both intended and unintended changes to the environment and human behavior. Teachers continue to feel pressure to integrate internet-connected technology into classroom and they see the changes it is bringing to their classrooms. First and most broadly that pressure to change comes from the reality that the world students will enter professionally will be even more tech-soaked than the current job market (McGowan, 2019), and therefore teachers have a responsibility to prepare students for that reality and help them practice the skills that will serve them in this dynamic future. On a more practical level, I work in a school district with 49% of students qualifying for free and reduced lunch and yet the community has agreed twice in ten years to raise property taxes specifically to support technology implementation in the schools. Those votes of support from the community require a commitment on the part of educators. If the community has been willing to make technology a priority, at a financial cost to families, then teachers owe it to the community to use the tools they are provided. My first-ring suburban district has offered a device for every student in grades six through twelve since the 2013-14 school year. Ensuring each student has daily access to internet-ready technology is often referred to as a *1-to-1 device initiative (1:1)*. This community commitment has spurred my own commitment to technology integration.

The district I work for has attempted to match the support from the community for technology integration by increasing the support for teachers as they push themselves to find ways to utilize the 1:1 device initiative with best practice strategies. No step by the district has been more beneficial than the hiring of two technology integration specialists who provide teachers support both at the individual and group professional development level. It is through these technology integration specialists that I became more aware of the work of teacher-researchers like Caitlin Tucker, who helped describe and support teachers transitioning into a classroom model that leveraged internet-based technology to support student achievement. A key idea articulated by Tucker, Wycoff, and Green (2017) was differentiating between *technology rich* classrooms and *blended learning* classrooms. Chapter 2 explores these two terms in-depth. T*echnology rich* classrooms are described by Tucker, Wycoff, and Green (2017) as classrooms that use a lot of technology tools that may interest or entertain students, but essentially do not change the style or character of the classroom that existed before technology was introduced. The term *blended learning* is often used to describe instructional strategies that use research-supported best practices in finding ways to add technology to support or augment those practices (Tucker, Wycoff, & Green, 2017). Blended learning does not just use the device to deliver different types of content to students, but provides teachers the ability to fundamentally change the way their classroom functions (Powell et al., 2015). These changes stand to benefit many aspects of and participants in the educational community writ large.

Stakeholders

As mentioned earlier in this chapter the phrase “the learning is in the conversation” inspired this capstone. Education is a noisy endeavor and involves many different groups of

having many different conversations simultaneously. At its best, this capstone has the potential to be a small but important part of the broader conversation on how to improve outcomes for students. On the personal level this capstone built my confidence in accessing and utilizing academic research to improve my classroom practices. As chapter 2 outlines, all students benefit when a teacher is able to supply effective and regular feedback. My hope is to deepen my understanding of feedback and use technology to implement that understanding effectively, which will have ripple effects into my students' lives and academic performances. Hamline University's practical requirements for this capstone that allow for a curriculum development project, made it possible that if done well, my work can ripple outward in other directions to benefit other educators as well. Most likely these conversations will happen within my building. I can be an advocate and an example for leveraging technology to provide best practice supported feedback. It's also possible that this capstone's presence in Hamline's digital archives allows other educators access to an applicable classroom tool.

Parents and guardians need to be included in the changes that technology and best practices based feedback bring to the classroom. Parents and guardians come to their child's educational experience with differing personal backgrounds as well as different expectations for what school looks like. This capstone's curriculum project involves a station rotation model that often relies on some *flipped* aspects of instruction. Chapters two and three explore the uses of *flipped* instruction in more depth but it creates a structure in which the majority of work is done in class where feedback can be direct and teachers can act as mentors or coaches. This can lead to a situation in which parents are confused about their student's workload. A blended learning environment does not necessarily require less work than a traditional classroom but the structure

and rhythm looks different from parents and guardians' perspective at the proverbial kitchen table. Teachers have a responsibility to communicate expectations to parents and guardians so they can feel connected to the work their students are doing. Parents and guardians also need to be included in these changes because as taxpayers, their money is being used to fund technology implementation and it is essential that they see and understand what exactly is being done with their taxes. Parents aren't the only leadership group that need to be educated about these changes, school administration often need to be taught as well about the changes that technology and improved feedback can bring.

I love the idea that administrators can take this focus on feedback into their own practices with interactions with staff. Administrators have an enormous responsibility to foster a professional community that is open to change and improvement, and feedback can be a key tool in building confidence in educators that is a prerequisite for the risk taking necessary for change and improvement. It is also important that administrators stay involved in the changes that technology will continue to bring to the classroom as their observations and drop-ins on classrooms will begin to look differently as technology allows teachers to spend more time in the mentor role and less time in the content delivery role, at least during class time. A flawed classroom model features the classroom door closed, and the belief that each teacher exists on an educational island. It is essential for real student support and real student growth that classroom teachers see their classroom and their process and one aspect in a broader community of education.

Rationale

This capstone question *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* demands my attention. Feedback is a highly successful tool to improve student achievement but it is underutilized by most teachers because of its complexity and because of the time constraints on and responsibilities of the teaching process. The reality that such a powerful tool is out of reach for so many classrooms indicates the difficulty in creating classroom structures that allow for excellent classroom feedback. Technology is not a panacea, but it can be a powerful tool when wielded intentionally. In the case of improving feedback, thoughtful technology integration can free teachers from some of the content delivery and some of the most simple feedback responsibilities. With technology giving students learning opportunities and correcting fact-based errors, teachers have more time each class period to engage in a conversation with individual or small groups of students about their learning process in a way that proves to students that it is their effort and their agency that can impact their performance in the learning experience. This set of expectations is highly motivating for me and provides a rationale for this capstone project.

Summary

Feedback is one of the most powerful tools teachers have to help students improve. There is a growing push in education to find, practice, and implement high quality feedback in classrooms. One of the big challenges of giving students high quality feedback is finding the time within the instructional day to connect with and communicate with students about their work. Technology, when used in a blended learning rather than technology-rich framework, can create more opportunities for teachers to give students feedback by lowering the amount of time teachers need to be in front of the class *delivering* content. The blended learning model gives

teachers more freedom to connect with students about their learning independently or in small groups. These strands are tied together in the question: *How can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* This chapter described how this particular set of issues came to my attention and became the framework for this capstone, briefly discussed how technology is currently changing classroom instruction, and explained how this work will benefit the larger educational community.

This capstone features a total of four chapters. Chapter three is a description of the process and curriculum project itself. Chapter four is a reflection of the entire process that synthesizes key observations and discoveries from research to curriculum development. Chapter two immediately follows this section and is a review of educational research on three main aspects of this capstone: classroom feedback, blending technology into the modern classroom, and how to prepare students for a shift to digital supported instruction and activities. First, chapter two looks at a decades long focus of educational research on feedback. The level of nuance researchers can provide educators on types of feedback is astounding.

CHAPTER TWO

Review of the Literature

Introduction

This capstone explores the question: *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* Addressing the question requires a familiarity with the research on classroom feedback, understanding ways in which internet-ready technology can be implemented in today's classroom, and how to effectively prepare students to adopt new technology skills within the context of their academic learning. All three threads of research open up a rich trove of fascinating research directly applicable to the classroom, starting with feedback.

Feedback to students is the first aspect addressed in this chapter and it is one of the most powerful tools in a teacher's arsenal to improve student outcomes (Hattie & Timperley, 2007). This review examines research into feedback including definitions, types, benefits, the framework within which to understand feedback and give effective feedback, as well as differing perspectives on the best uses of different forms of feedback. Despite the attention researchers have paid this topic over decades, many classrooms still lack a routine to give best practices supported feedback, leaving students without a powerful way to practice and refine their skills. Technology can be one tool to address this dearth of effective feedback.

Research on technology that can be used to form effective feedback systems is focused on a 1:1 setting which is defined as an internet-ready device available for every single student. Any technology-based initiative requires a lot of heavy lifting by a district and one as complex as a 1:1 setting is still out of reach for far too many students in the United States today (Roswell, Morell, & Alvermann, 2017). However, the expansion of this type of instruction is a significant change in the educational landscape over the last two decades and is changing the way many classrooms function (Powell et al., 2015). This review defines and focuses on a 1:1 setting form of instruction called blended learning. The section also describes the possible benefits of utilizing blended learning in a secondary classroom. Any implementation of a change in classroom routine requires significant attention to how students will react and need to be supported. Using a 1:1 setting to create blended learning opportunities cannot be introduced and implemented by a classroom teacher without thoughtful structures and instruction and that is why the third section of this chapter focuses on effective ways to implement technology-based changes to a classroom.

As much as any industry, educational settings have been affected by preponderance of personal internet-ready devices over the fifteen years. Teachers have seen this wave of technological integration happen as they age and recognize it as a major change, while most students see a world ubiquitous digital interconnectedness as normal. These generational differences have taken some time to clarify themselves, but research today seems to suggest that while students do come in with a powerful set of skills as it relates to familiarity and comfort with technology, they still need significant direct instruction to add or more fully develop their digital literacy skills (Martinez & Prensky, 2011). The final section of this chapter reviews the research involving introducing new technological skills which researchers and practitioners often

referred to as *digital literacy* to generations of students that feel comfortable with some but not all aspects of a tech-soaked world. The research shows that while many students feel comfortable being constantly connected to social media universe unimaginable a few decades ago, they still need a great deal of support to develop skills and strategies to effectively use technology in multiple settings to express their ideas. These three main threads of feedback, technology integration, and digital literacy will be explored below.

Formative Feedback Overview

Secondary education can be an exhausting back-and-forth transition between the broad transformative goals of education and the granular detail of effective implementation of a specific learning outcome. Formative feedback offers educators a rare opportunity to see both ends of the education spectrum; both the inspiring big picture of becoming truly *educated* with the granular specifics of proper classroom structure. Black and Wiliam (1998) described the goal of formative feedback as supporting and encouraging students to ultimately take ownership of improving their own learning. Such a transformative goal that involves increased student agency is an exciting starting place for an exploration of the power of feedback in the classroom. This capstone builds from Hattie and Timperley's (2007) definition of feedback as "information provided by an agent regarding aspects of one's performance or understanding" (p. 81). The use of the word *agent*, rather than teacher or instructor is important because it recognizes there are opportunities for feedback between students and with students' internal conversation. Studying feedback from the perspective of different *agents* is just the first of many ways to understand the complexity of classroom feedback.

Each type of feedback requires a specific set of classroom scaffolding and instruction. In order to increase the detail and focus of this chapter, a single *agent* of feedback, the teacher, will remain the focus. This capstone specifically explores formative feedback which Shute (2008) defines as, "information communicated to the learner that is intended to modify his or her thinking or behavior for the purpose of improving learning" (p. 154). Chapter one outlines the appeal and power of this process based formative feedback as opposed to the more static summative feedback. This section explores the results of effective feedback on student achievement, why feedback can be so effective, describes a framework to provide effective feedback, and discusses the variations of evidence researchers have to support the use of feedback in class.

Effectiveness of quality feedback. Although feedback is a popular touchstone in education today, it is by no means a new concept to educational researchers. In Schute's (2008) review of research on feedback studies as far back as the 1980s are used for relevant data. This sort of historic overview supports the claim that feedback has long been seen as a powerful tool for student achievement. Hattie and Jaeger's (as cited in Hattie & Timperley, 2007) 1998 analysis studied 12 different meta-analysis of feedback research. On average, those analyses found feedback to have an effective size of 0.79 for student achievement. Effective size measures the amount of student academic growth over the course of a school year. On average, students experience growth at an effective size of 0.40. Feedback, if done properly, can nearly double student achievement growth rate for a given year. Hattie and Jaeger (cited in Hattie & Timperley, 2007) list feedback as a top classroom intervention that positively impacts student

achievement along with direct instruction, reciprocal teaching, and students' prior cognitive abilities.

Despite so much evidence suggesting the benefits of feedback to student achievement, Hattie and Timperley (2007) noted "It is difficult to document the frequency of feedback in classrooms, except to note that is low" (p. 100). Bond, Smith, Baker, and Hattie (as cited in Hattie & Timperley, 2007) found that even teachers who have passed National Board Certification (NBC) have low rates of feedback in their classrooms, and the feedback that is given is most often the type of feedback that is least beneficial. NBC is a rigorous advanced teaching certification that has shown links to increased student achievement (Barnett & Ferriter, 2006) and yet research suggests that even these dedicated and well-trained teachers struggle to find ways to give effective feedback to students. This fascinating conundrum drives this capstone: feedback has long been documented as a powerful tool for student achievement and yet roadblocks seem to exist stopping even the most talented and well trained teachers from giving it effectively. With such a disconnect between research and practice the capstone question *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* seems to fit comfortably in context with current research gaps; or more accurately current practice gaps. Now that the benefits of feedback have been established, the next section describes why well-structured feedback has such a positive impact on student achievement

Why formative feedback works. As discussed in chapter one, summative feedback is given after a student completes an assessment and will not be the focus of this capstone. Shute's (2008) definition of formative feedback, "information communicated to the learner that is

intended to modify his or her thinking or behavior for the purpose of improving learning," (p. 154) seems to suggest that the feedback and the learning are going on simultaneously, part of an ongoing process. By focusing on changing student behavior or redirecting student thought process rather than a strict evaluation of a final product, formative feedback attempts to follow one of the key components Black and Wiliam (1998) heralded in their research, which is divorcing feedback from a specific grade or score.

By decoupling grading from feedback, the student's focus can be on the formative feedback itself and the opportunity to make improvements to their work or learning are still possible without a grade evaluation directly attached. According to several researchers (Pat-El, Tillema, van Koppen, & Sabine, 2012), while student motivation is highly complex, if structured properly, feedback can have a significant impact on the way students see their mistakes and abilities to react to mistakes. In particular, Hattie and Timperley (2007) described how positive feedback may make it more likely that students will persist with a challenging subject. Paas, Renkl, and Sweller (as cited in Schute, 2008) added to the evidence that formative feedback can support learners during the most challenging aspects of the learning process by showing that struggling learners have a decrease in cognitive load when receiving effective formative feedback which will also likely increased student motivation. Black and Wiliam (1998) added that formative feedback is particularly effective when used with students who are struggling because it allows for them to "concentrate on specific problems with their work and gives them a clear understanding of what is wrong and how to put it right" (p. 143). This evidence points back to that broad based goal of education, that students will take ownership of their learning. How students respond to mistakes and setbacks can be aided by proper feedback. These positive

implications for learners who are struggling can also be aided by decreasing the size of the learning cohort.

If students are able to work in smaller groups of peers and meet with teachers in those smaller groups, struggling students will have access to peer examples, and could find increased motivation as a result of these feedback sessions in small groups (Pat-El, Tillema, van Koppen, & Sabine, 2012). Feedback works well when separated from the grading process and may have the biggest impact for students when they struggle the most. The next section explores how to best build formative feedback into a classroom routine or structure.

Feedback within a framework. Hattie and Timperley (2007) go beyond showing research that supports the power of feedback to improve student achievement. They go on to describe the classroom structure necessary for feedback can be most effective. This structure features feedback as second phase in a three-phase classroom feedback system. Their broader classroom system starts with the understanding that useful feedback only happens after a clear set of goals or expectations have been articulated by the classroom teacher. If those goals or expectations have been clearly laid out, Hattie and Timperley (2007) argue the potential for beneficial feedback exists.

By clearly articulating learning outcomes in phase one, Hattie and Timperley (2007) suggest that teachers have specific descriptors to best give feedback to students and those plans are described later in the chapter. The second phase is the feedback itself, explored in this section. The third phase Hattie and Timperley (2007) describe is when the feedback reaches the students. At that point students have agency to use, ignore, or misunderstand the feedback, or as Kulhavy (as cited in Hattie & Timperley, 2007) noted, “feedback can be accepted, modified, or

rejected" (p. 212). Feedback cannot happen in isolation, in needs to be given after clear expectations have been developed and students ultimately have agency to choose how to respond to the feedback. This explicit breakdown of the feedback process helps explain why effective feedback is so difficult to provide, even for the most experienced teachers. By elucidating this three step process Hattie and Timperley provide a framework on how to build success. The feedback necessary for improved student outcomes itself can take a variety of forms as described in the following section.

Feedback types. In the previous section, phase one of Hattie and Timperley's (2007) feedback structure requires clearly articulated learning outcomes. The second phase of their structure features the feedback itself, which varies significantly based on what the learning outcomes are for the particular task. Hattie and Timperley (2007) divided feedback in four categories or types: task level, process level, self-regulation level, and self level. The need for educators to recognize what type of feedback is effective for a particular learning outcome shows the complexities of the educational milieu.

Task level (TL) feedback is specific to the content area and the learning goals that the classroom teacher must articulate. Hattie and Timperley (2007) described TL feedback as specific to a fact-gathering student action. Feedback at the task level should be immediate and can be very simple and straightforward. An example of TL feedback would be for a teacher to correct a student's incorrect statement *The Emancipation Proclamation was issued in 1865*. The teacher should immediately and directly correct the student: *The Emancipation Proclamation was issued in 1863 in the middle of the Civil War, not the end.* The next level of feedback is less binary and more about broadening a student's perspective on a topic.

Process level (PL) feedback is described by Hattie and Timperley (2007) as focusing on the concepts and tools used to arrive at or display the fact based learning. Earley et al. (1990) pointed to a real synergy between excellent feedback at the task level helping to build effective opportunities for process level feedback. Both Earley and Harackiewicz (as cited in Hattie & Timperley, 2007) found great PL feedback is about cueing reflection on the strategies of how to find new information, both the *where to look* and the *types of questions* to ask. This type of feedback could involve a question about the type of source (primary or secondary) or the format of an article (reporting or opinion) to encourage students to broaden their research. PL feedback fits very well with the idea of digital literacy skills discussed later in this chapter, and is easily transferable to other areas of study outside the specific task or assessment students may be working on. While PL feedback focuses on strategies the student used specific to the topic, subject, or assignment, self-regulation feedback is directed at the student's internal thought processes.

Hattie and Timperley (2007) described self-regulation (SR) feedback as the sum of a students ability to conduct self-appraisal and perform self-management as a learner. Self-appraisal is seen as the student's ability to evaluate how the learning process is going and where help is needed. Hattie and Timperley (2007) also stated that self-management is the students' skills with "monitoring and regulating students ongoing behavior through planning and correcting mistakes and using fix-up strategies" (p. 94). What is most relevant in this case is self-regulation feedback in a successful learning environment creates the motivation for students to ask for feedback from others. As discussed earlier, this SR feedback can be most helpful to aid teachers supporting students who are struggling to master a particular learning target or content.

This type of feedback needs to happen as the learning process or the assessment attempt is on-going. Teachers need to craft questions or statements that keep students' confidence up while pushing them to look for new strategies.

SR feedback helps teachers distinguish between the confident learner who is willing to ask for help while struggling and the student who chooses to sit, flummoxed, staring at a screen until the end of the period rather than asking the teacher for help. Another useful observation that Kulhavy and Stock (as cited in Hattie & Timperley, 2007) offered is that if students have a low confidence in their responses, feedback will likely be ignored. Instead teachers should offer further instruction and information as opposed to feedback in those cases. Analysis of self-regulation feedback helps teachers navigate students who seems unwilling to ask for help despite struggling as well as offer teachers advice on when the appropriate times are to give students feedback. SR feedback is made up of several different aspects and requires teachers to be aware of individual students' skill level and motivation. The final type of feedback, self level, includes some of the more surprising results of Hattie and Timperley's research.

Self level (SL) feedback (eg. Great job! You are an excellent student) is, according to Hattie and Timperley (2007), worthless or dangerous given the student's ability to twist or misrepresent the role effort or specific skills may have played. Hattie and Timperley (2007) continued to say that SL feedback that focuses on the person rather than the task, process, or self-regulation fails "because it carries little information that provides answers to any of the three questions and too often deflects attention from the task. Various meta-analyses have demonstrated its ineffectiveness" (p. 96). However, it is very important to note Hattie and Timperley (2007) are not wholesale rejecting positive feedback. Deci, Koestner, and Ryan (as

cited in Hattie & Timperley, 2007) recognized "positive feedback, however, can increase the likelihood that students will return to or persist in an activity and self-report higher interest in the activity" (p. 99) The key is recognizing how a compliment is given, does it speak to the student's effort or their entire personhood.

It is essential that teachers reflect on the types of feedback they are giving students and ensure that feedback is given within classroom situations with clearly described learning goals or outcomes and acknowledge that individual students have the final control on what happens to a classroom teacher's feedback. There is considerable support for a focus in a classroom on feedback, but the next section will highlight some of the studies that offer differing perspectives on how best to give students feedback in the classroom.

Variant perspectives on feedback. The literature on feedback does feature some conflicting and varied conclusions. For example, the impact of positive feedback on behavior is mixed. Kluger and DeNisi (as cited in Hattie & Timperley, 2007) found that no praise was more effective than praise at increasing student achievement. But other studies, such as Konold, Miller, and Konold (2004), showed that it is important to give feedback on what students are doing well as well as what can be improved on. Along with the tenor and focus of the feedback, Jang and Stecklein (2011) focused on the form in which the feedback is given. They describe excellent feedback as coming from question-based dialogue facilitated between students. Some of the structural changes suggested later in this chapter may create space for student-to-student dialogue where question-based feedback can occur organically but it requires more study. Another divergent perspective on feedback is offered by Pridemore and Klein (as cited by Hattie & Timperley 2007) who showed detailed feedback on how to improve and not simply whether

an answer is correct is helpful, but Shute (2008) contrasted the push for detailed feedback with evidence that if the feedback is too long or complicated many learners may ignore it all together. These contrasting ideas about feedback length supports the previously explained preference by Hattie and Timperley (2007) for process based (PL) feedback. It also highlights a *Goldilocks* challenge: feedback must be specific and often process based, but not so wordy that students stop reading it or fail to act on it, which is described in phase three of Hattie and Timperley's (2007) structure for feedback. This complexity in formative feedback requires educators to make many decisions many times over on a regular basis. Late this chapter the capstone will discus how to use *on-boarding* to ensure students have as many skills as possible in order to help streamline classroom functions to give teachers the flexibility necessary to offer excellent feedback. The focus on teacher feedback length is balanced with the importance phase three, or the role of student agency, in any feedback discussion (Hattie & Timperley, 2007). Other research looks more at how students participate in the feedback process.

Dillion (as cited in Black & Wiliam, 1998) showed that measuring the ratio of teacher talk time to student talk time during a feedback opportunity can predict the effectiveness of the feedback. Having a talk time ratio between student and teacher that is equal when participating in verbal feedback ensures more effective utilization of that feedback according to Dillion's research. Not only is conversation important between teacher and student but Black and Wiliam (1998) found evidence that teachers need to model to the entire class that they too take feedback into account in order for students to choose to act on teacher feedback. Black and Wiliam (1998) showed that teachers must describe the steps and adjustments they are making in the classroom

based on student feedback. All of these strategies and types of feedback offer opportunities for classroom teachers to improve student outcomes but too often feedback is not offered effectively.

As outlined above, feedback needs to happen within a framework of clear goals and student agency. In the opening of this chapter Hattie and Timperley were cited as noting even the most well trained teachers still often fail to give feedback (2007). Konold, Miller, and Konold (2004) agree and go further to describe the cause as "unfortunately, it is easy to become engrossed in lesson content and many other teaching-related responsibilities and subsequently forget about the importance and benefits of providing high-quality feedback" (p. 64). One important tool Hattie and Jaeger (as cited in Hattie & Timperley, 2007) offered to address that "forgetting" to provide feedback is for, "teachers [to] automate many other tasks in the classroom and provide rich learning opportunities for all students and thus have the time and resources to be responsive to feedback" (p. 103). Finding opportunities and classroom structures to create more student autonomy and open up space for feedback dialogue appears to be a powerful tool and will be discussed in the next section.

Summary of feedback research. Research on the effectiveness of feedback in the classroom is decades long and fairly consistent. Feedback should happen relatively quickly and be clear and concise enough for students to see the opportunity for new learning, believe it is achievable, and are appropriately guided into those next steps, directly linking to the clearly stated goal, outcome, or task is. It is challenging to find time to provide the exact kind of feedback that individual students need to experience measurable growth, but classroom routines can be developed to aid teachers in this endeavor. This capstone asks the question *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced*

formative feedback at the high school level? This section has attempted to prove that teacher-sourced formative feedback is a powerful tool worth creating structures to improve its quality and frequency in the classroom. This next section describes ways that technology is being used to change classroom structures and can create opportunities for more and better feedback.

Blended Learning

The gap between effective formative feedback's powers to improve student achievement and its difficulty to implement urges that teachers explore new tools to increase the feedback given to students. This chapter explores how technology provides an opportunity for teachers to work in small group and individualized settings with students. This chapter's introduction included the reality that far too many school districts in the United States of America lack the infrastructure and financial support to provide students with necessary technology exposure such as offering a 1:1 setting defined as an internet-ready device available for every single student. Consequently the reality of implementing technology-based changes to classrooms varies widely. This creates a system of *haves* and *have-nots* which is unacceptable both from a civil rights perspective but also from a survival perspective of our nation's economy. However this section explores some of the diverse ways technology is being utilized in classrooms today. The specific type of technology integration that this capstone explores is known as blended learning. The Innocite Institute's definition of blended learning (as cited in Ballantyne Waln 2012) described blended learning as

> a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place,

> path, and/or pace and at least in part at a supervised brick-and-mortar location away from home. (p. 3)

This broad definition reflects the variety of ways in which technology can be integrated into learning using blended learning techniques. The definition itself can be challenging as some educators, parents, and students may find it difficult to imagine an educational setting in which the time, place, path, and pace of education are variables that might be different for each student. In order to study blended learning in more detail, it must be broken down further into different types based on salient characteristics.

A key idea articulated by Tucker, Wycoff, and Green (2017) was differentiating between *technology rich* classrooms and *blended learning* classrooms. Tucker, Wycoff, and Green (2017) described technology rich classrooms as those that use a lot of technology tools and may interest or entertain students, but essentially do not change the style or character of the classroom that existed before technology was introduced. If the classroom had been rigorous and collaborative before technology rich education, it now had new ways to drive rigor and creative ways to collaborate, but if the classroom had been struggling with routine and student engagement those problems remained, perhaps manifested in new ways. Technology rich classrooms might appear exciting to a visitor, but the master teacher pushes past the largely superficial changes that technology rich teaching offers and begins to implement blended learning with the hope that real improvements can be made to student achievement (Tucker, Wycoff, & Green, 2017). 1:1 classroom settings can be divided into technology rich and blended learning settings, and the blended learning settings can be further broken up based on a few key characteristics.

The capstone divides blended learning into two types using the format described by Tucker, Wycoff, and Green (2017) of Highly Individualized Blended Learning (HIBL) and Traditional Classroom Blended Learning (TCBL). Both of these blended learning types utilize similar technology tools such as an online Learning Management System (LMS), content delivery tools such as video or *flipped* instruction, and some type of rotation among topics or activities. The major differences between the two formats are where the learning takes place which was one of the key variables in Ballantyne Walne's (2012) definition, and the likelihood that students will be working in collaboration with students. This section describes and explores both types of blended learning.

Highly individualized blended learning. HIBL is the more independent of the two types and is much more likely to take place in a setting that appears different than a traditional high school classroom. HIBL can be accessed remotely, perhaps from the students' home, or in redesigned schools that might appear more like modern co-working spaces than a classroom with desks and a whiteboard. In this way HIBL focuses on the aspect of the Innocite Institute's definition of blended learning that allows for changes to where education takes place. Tucker, Wycoff, and Green (2017) described HIBL allowing students to access content that is adaptive to their individual ability and performance level. In these formats the student enters a learning environment and the computer has procured a set of learning tasks based on the individual student's previous performance and teacher determined learning goals. These tasks are separate and unique compared with other students in the class, whether seated next to the student or logged in elsewhere. Currently the type of technology that supports HIBL almost always requires the support of an outside software program that comes at a significant financial cost to the

district or school system (Tucker, Wycoff, & Green, 2017). Powell et al. (2015) reported these types of blended learning least resemble a traditional high school setting, but by virtue of Innocite Institute's definition must include some type of brick and mortar setting as an option or part of the educational process, usually available for reteaching or further support. Several HIBL environments have found considerable success and continue to grow and expand.

Florida Virtual School and Grandview Preparatory School are two examples of schools that have been working with the HIBL strategy for over ten years. Both systems have found success by working to increase the ease of access both to online curriculum that allows of asynchronous attendance in classes as well as an ability to meet with instructors in a one-on-one setting, whether that be physically or digitally for further support (Tucker, Wycoff, & Green, 2017). While this type of highly individualized learning offers unique opportunities for differentiation and student engagement, there are some drawbacks.

Mickey Tubbs, the principal of another HIBL school, Alliance Tennenbaum Family Technology High School, CA, suggested that this type of programming is most effective in math and language arts, with fewer effective software options in other subjects (American Institute of Research, 2013). While Tubbs limits in her criticisms of this method, perhaps to maintain her school's current relationship with a particular programming company, one can imagine why certain tasks such as speaking skills in foreign language acquisition, argument structure in social studies, or lab set up in the sciences, are difficult to facilitate with current limits of algorithms and computer based learning at this point in the technology's development. HIBL is not the focus of the following review of literature. The second blended learning strategy described next is more often used in a traditional brick and mortar classroom setting and because of that fact it will

be the setting for curriculum implementation in this capstone described and reviewed in chapters three and four.

Traditional classroom blended learning. Traditional Classroom Blended Learning (TCBL) happens when technology is introduced into a classroom that may not look much different than any other classroom in a traditional public or private school but the technology is being used to increase student choice, offer differentiation, and allow for at least some content delivery to be shifted from the teacher to an aspect of the online technology (Tucker, Wycoff, & Green, 2017). Most Traditional Classroom Blended Learning (TCBL) has its basis in modern elementary school models of station rotation. According to Ballantyne Waln (2012), traditional station rotation usually involves small groups of students (between 3-8 students) moving around the room and completing different tasks at a variety of locations in the classroom. Each task/station involves a different way of interacting with similar content. Grouping types and mechanism for rotation are determined by the teacher. For a station rotation to be part of blended learning, Tucker, Wycoff, and Green (2017) indicated that some type of internet-ready technology must be part of at least one station. These authors continued adding flexibility to the definition by stating that stations can be physical locations around a classroom or a set of digital "stops" that students must complete to explore or prove mastery of a topic (Tucker, Wycoff, & Green, 2017). In TCBL station rotations become diverse and flexible strategies for students to interact with content in a variety of ways.

It is clear that one by-product of work in this type of classroom structure is a flexibility, in both time and possibly content. TCBL is predicated on the perspective that the classroom should meet the students and the content where it is at, rather than force the student or the

content into a box that does not quite fit. How a station *looks* is less important than ensuring students have *choice and flexibility* in which task and how to complete a task. That flexibility allows for different types of content. For example, many TCBL station rotations involve at least some amount of *flipped learning*. Flipped learning involves students taking in some content outside of class and then interacting with it during class and with the support of a teacher (Tucker, 2018). TCBL station rotation's flexibility continues right on into what type of content is *flipped*: the content could be a teacher-created video outlining key ideas *or* a photograph of Sudanese street protests in 2019. The point of a flipped assignment is that students come pre-loaded with some content and work on the challenging pieces of the learning together with peers and the support of an educator. Technology allows for variety and flexibility as outlined in this section; the next section will look at how and why blended learning may be effective in increasing student achievement.

Effectiveness of blended learning. Blended learning is a classroom tool or structure and should not be implemented simply as an excuse to put devices in the hands of students. There must be an end that justifies the means of blended learning. There is some disagreement on the extent to which blended learning can impact student outcomes. At Harvard, Larry Cuban's rather tepid endorsement of blended learning (as cited in Herold, 2017) is based on the perspective that there are three ways to structure a classroom activity: large group, small group, and independent. Cuban holds that technology does not change the reality of classroom activity options, it simply allows for different ways to instruct within a large group, small group, or independently.

Herold (2017) pointed out that Cuban suggested that small group and independent learning are the most beneficial and frequently under-utilized in classrooms today. Despite his

leeriness of overselling the power of blended learning, Cuban recognized the ability of blended learning to help facilitate and encourage more small group and independent learning activities in a classroom (as cited in Herold, 2017). On the other end of the spectrum, Powell et al. (2015) saw blended learning as offering a "fundamental redesign of the instructional model" (p. 6). It is exactly because of both the hope for blended learning and this disagreement about its effectiveness that blended learning deserves further investigation. One of the fundamental disagreements between Cuban and Powell is whether technology changes the role of the classroom teacher.

Powell et. al. (2015) argued both HIBL and TCBL change the role of the teacher from being a "purveyor of information" and instead encourage transformation into the role of "coaches, concierges, guides, and mentors" (p. 17). When this flip occurs and teachers are freed of having to constantly be delivering content during class, the benefits of blended learning include opportunities for quicker feedback loops than in traditional instruction. This change from a "content delivery individual" to a "mentor-coach" identity as Powell et al. described (p. 17) addresses the challenge of not just integrating technology but maintaining curricular fidelity (Calvert, 2015). This requires not only a mastery of the tools of technology but recognizing them as tools for more targeted instruction. Both forms of blended learning are also a tool for flexing larger class sizes into manageable sizes by grouping students in a variety of ways and offering the opportunity to allow for more tools and angles to differentiate content that is responsive to varying student needs (Tucker, 2018).

Blended learning supporting classroom feedback. Earlier sections in this chapter explored how effective feedback can be for student achievement and how infrequently it is used

even by expert educators. The capstone is exploring how blended learning can provide some structures that may help improve the frequency and type of teacher feedback. Both types of blended learning described above create space to speed up the feedback loops for teachers and students. Blended learning can create a specific learning station station, physically or digitally, be set aside for teachers to meet with small groups of students with a set of questions to be discussed or time for review and formative feedback of current work (Jones, 2007). Teachers also may be free to wander the room and visit a variety of stations depending on when and how often groups need feedback (Tucker, 2016). Some teachers report feeling that station rotation allows for large classes to "feel" smaller as they transition from station to station rather than keep all individuals on the same task (Tucker, 2016). The ability for teachers to choose student groupings and modify individual stations or have stations of varying difficulty levels may give teachers the chance to offer more differentiation to students. Many researchers also believe a blended format allows for more inquiry that in turn may provide students with a more realistic preview and practice for future careers that will continue to partner with technology in new ways (Powell et al., 2015). Blended learning's flexibility and the opportunities it creates require teachers to reflect on their role in the classroom structure. The other obvious and practical challenge of these multi-faceted, diverse instructional techniques is the "upfront" time necessary to implement the process.

Tucker (2017) made clear that incorporating blended learning into any classroom take a significant upfront investment of time and research by the classroom teacher. Blended learning implementation by a busy classroom teacher must have clear, specific, and research supported benefits to justify all of the time invested in building the structures, routines, and skills necessary

to implement blended learning. This capstone's curriculum project is based on the assumption that the research supporting formative feedback demands attention from the classroom teacher and the research supporting blended learning suggests that it could be a powerful tool to help improve classroom feedback.

Summary. The benefits of formative feedback can be more directly deployed and repeatedly achieved in a classroom of well-implemented blended learning. Both highly individualized blended learning (HIBL) and traditional classroom blended learning (TCBL) push technology to be used to improve existing formats of education, not simply adding technology to maintain previous results. The spectrum of academic research support for blended learning is represented by Larry Cuban on one end suggesting that both types of blended learning simply give teachers a tool to create small group and individualized learning experiences within the classroom (Herold, 2017). On the more revolutionary end of the blended learning analysis is Powell et al. (2015) who believed blended learning represents the start of a fundamental change in the way classroom education takes places. Regardless of how excited educational leaders and researchers are about blended learning, most appear to agree that the format offers the opportunity for instructional benefits including increased incidents of rapid feedback and an increased opportunity for differentiation. The guiding capstone question *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* relies on the understanding that educational research shows blended learning allows for more flexibility for the teacher to shift role away from content delivery and toward a more feedback-based role as mentor-coach. The next section highlights how to prepare students for the challenging changes blended learning requires.

Preparing Digital Natives for Blending Learning

Prensky popularized the term "digital native" in 2001 (as cited in Prensky, 2006) to describe humans who grew up surrounded by, and using digital tools. This term gave words to the feeling many educators had about a cultural divide with their students. Students walk into classes with their headphones on and their thumbs traveling deftly over screens to communicate with friends sitting next to them while many adults feel overwhelmed by an avalanche of digital passwords to remember and the loss of cursive handwriting as a cultural touchstone. While many of these "digital natives" may feel more comfortable falling asleep with their phones in their hands than their teachers would (Twenge, Krizan, & Hisler, 2017), a growing body of research led by Martin and Roberts (2015) suggested that simple birthright citizenship into the digital native community doesn't ensure students are coming to class with a mastery of the technological skills that a "connected" classroom demands of them. The differences in skills between digital natives and older generations is more complex and nuanced than the labels suggest, and educators must understand their responsibility to build on students' existing digital skills.

Tucker, Wycoff, and Green (2017) insisted that successful implementation of technology based formats such as a TCBL format of station rotation often hinges on ensuring students are instructed in the skills needed for success on an assignment or assessment prior to beginning the assignment or assessment itself. Most of these skills are broad based digital skills that Martin and Roberts (2015) called *digital literacy*. This awareness requires the classroom teacher to

accurately identify specific skills are necessary to implement any blended learning and how to establish norms of behavior for this type of blended learning to allow the focus for students to be in content and skill practice rather than by sidetrack by confusion or a lack of familiarity. Students need to be primed for this type of structural change, and the broader educational community needs to be included in these changes and new expectations as well. It is important to credit teachers as having an important role to educate students in these digital literacy skills as teachers bring an awareness and skill set with technology to the table that their digital native students need.

Schaafferhauser (2014) reported in a study of students and science teachers that by most measures, as a group, the teachers had more technology skills both in the classroom and for social use. This evidence supports the idea that students need support when interacting with technology especially in the classroom; their familiarity with technology should not be confused with expertise. Martin and Roberts (2015) are among the growing chorus of educators and researchers that want to add the idea of *digital literacy* into the dialogue alongside *digital native*. The American Library Association's Digital Literacy Task Force (as cited in Martin & Roberts, 2015) defined digital literacy as,

> the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. Students today are comfortable using devices and computer-based tools to find information and immediate answers, but digital literacy requires more from them than the simple ability to use technologies. (p. 19)

While students might feel very comfortable using a Google search to find out where Martin Luther King Jr. went to graduate school, or even use an app to help solve a math problem, those skills should not be confused with being fully digital literate. Bestwick and Campbell (2010) articulated a complex set of skills to include in the discussion of digital literacy including abilities to:

> solve problems in real time, to be fluent in acquiring and assessing information, to have the ability to work collaboratively, to be creative, and to use media to communicate effectively. Mobile technologies have the capability to support these skills within formal and informal learning environments for all learners. (p. 18)

Other skills that teachers may decide to include in their digital literacy toolbox include being able to carefully read and take notes on a piece of writing on a screen (Martin & Roberts 2015), or understand appropriate ways to interact with fellow learners in an online dialogue space (Tucker, Wycoff, & Green, 2017). It is essential that teachers take on these digital literacy skills and embed them into their curriculum. Today's students, digital natives or not, need a strong portfolio of digital skills as they enter the rapidly changing economy. A 1:1 classroom that utilizes TCBL or HIBL is uniquely equipped to ensure digital literacy is part of the classroom experience.

Even if digital natives are not entering classrooms with a variety of technology-based skills fully mastered, the research does suggests that these digital native students, "are quick to adopt technology, but need to build a bridge which allows them to use it effectively in academic settings" (Tucker, Wycoff, & Green, 2017, p. 98). Tucker, Wycoff, and Green went on to develop a framework for ensuring students can find success using blended learning by ensuring

they are exposed to and allowed to practice key skills necessary to find success in these digital environments (2017). Tucker, Wycoff, and Green refer to this framework as *onboarding* and use language from the business culture to describe it as

> specific practices used by organizations to successfully help recent employees enter their new work environment. Through this process, employers strive to reduce any uncertainty and anxiety of the newcomers, help them make sense of their new environment,s and provide them with the necessary tangible and intangible resources to become successful organizational members in their new role. (p. 96)

Tucker, Wycoff, and Green's (2017) strategy for onboarding students in preparation for blended learning relied heavily on Wiggins and McTighe (2011) curriculum format of Understanding by Design (UbD).

UbD outlines a process of identifying desired outcomes from a learning experience, then determining the evidence an assessment would provide, and finally designing a learning experience that will yield the results outlined in the first two steps (McTighe & Wiggins, 2011). By using this onboarding technique supported by Understanding by Design, Tucker, Wycoff and Green (2017) report that while mistakes will not be eliminated, because it is always important to build in room for learning through failure, but onboarding provides students with the necessary support to implement any type of blended learning in a classroom setting.

Traditional Classroom Blended Learning (TCBL) creates several layers of on-boarding that need to be addressed by teachers implementing this system. The physical movement around the room which is often a key part of station rotation requires a good deal of on-boarding as it may be the first time students have engaged in station rotation at the secondary level. At each

station in a TCBL station rotation there also will likely be digital literacy skills that students need to be familiar with in order to complete the station task. Calvert (2015) went as far as citing Dillion by stating, “no task should ever be placed at the station unless students have previously demonstrated proficiency” (p. 150).

While there are cultural differences between digital natives and the adult learners/instructors in classrooms (Prensky, 2006) those digital natives cannot be expected to enter the classroom with an entire tool kit of digital tools or complete digital literacy (Martin & Roberts, 2015). Tucker, Wycoff, and Green (2017) wrote that successful implementation of blended learning requires teachers identifying the skills necessary for success and building in practice for students to on board those skills as blended learning is rolled out into the classroom.

Rationale

Research shows that feedback is a very successful in improving student performance but it is often underutilized as tool to in most classrooms (Hattie & Timperley, 2007). Feedback is incredibly complex and due to that complexity it seems likely that it will be in the domain of classroom teachers and not taken over by machine learning anytime soon. With its power to improve student outcomes, scarcity, and human-centered control, feedback seems an important area for teachers to study and improve their implementation.

In a 1:1 setting, TCBL station rotation is a powerful tool to create space for teachers to give feedback, especially formative feedback separated from a grade or score. The flexibility of blended learning not only allows for differentiation and student choice, but also enables teachers to push in for specific, frank conversations with students regarding their current level of understanding and/or performance.

Summary

Teachers must be committed to improving student achievement. Research on feedback from Hattie and Timperley (2007) using effective size as a measure of success suggested that feedback is exactly the type of powerful tool in the classroom that can be used to boost student achievement but it is frequently underutilized or incorrectly applied. In order to create space for teachers to implement and improve their feedback, they must change some of the routines and structures in their classroom to create opportunities for quality feedback. Usually feedback regarding the process or self-regulation of a learning activity is the most effective type of feedback to give and must become a regular part of the classroom experience. If set up properly, certain TCBL tasks may create the space teachers need in order to practice and improve their abilities to give feedback that is timely and specific to process, student-regulation, or the content, which can have significant impact on improving student performance

Blended learning is in danger of becoming an overused educational cliche that is applied to any educational activity with a screen involved. The ubiquity of the term and its sometimes amorphous definitions do not negate its possibilities in providing teachers creative ways to support changes to classroom routines and structures when applied properly. While it is clear that simply adding more computer screens into a classroom does not instantly improve student outcomes (Bowels, 2019), it is very hopeful that teachers can continue to find innovative ways to off-load certain aspects of the classroom experience to computers. Tucker, Wycoff, and Green (2017) made a strong case that blended learning offers realistic tool for all teachers to connect

individually with every student over the course of a few class periods, if structured properly. For example the grading a simple learning check, or delivering an explanation of five key vocabulary words by a program or video may free the teacher to assume a more direct, mentor-coach role with more and more students at regular intervals. That ability to connect individually with students must be done in a thoughtful, planned way.

Because students are familiar with technology, but often only familiar with a narrow application of those tools, any implementation of blended learning with digital natives must also include significant front-loading or onboarding of skills and expectations in order for blended learning to give each student the opportunity to find success. On-boarding is described by Tucker (2017) and takes attention to detail and needs to be supported by a curriculum mapping format such as Understanding by Design.

In the following chapter, this capstone question *How can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* is applied to create a specific unit of instruction for a high school social studies classroom. Special attention is paid to on-boarding students with the skills necessary to have success, and building in opportunities for each student to engage in formative feedback conversations with the classroom teacher.

CHAPTER THREE

Project Description

A capstone is a powerful experience for an educator to create. Education is such a complex endeavor and focusing on a single question, in this case: *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* can be a great tool for improving teacher performance and increasing student achievement. Since my district received a specific increase in technology spending via a taxpayer approved referendum, the district has gone to a 1:1 device policy described in chapter two. This commitment from the community has compelled many teachers including myself to honor that community trust and find ways to integrate technology by more than merely moving a paper worksheet to a computer screen. Blended learning is the systematic way to implement rigorous, research supported best practices into a classroom using technology as the vehicle to deliver those changes. This capstone chooses to leverage technology in the task of improving the feedback students receive from teachers.

As the conversation in education continues to focus more and more on students showing growth and improvement regardless of benchmarks or ability, the concept of feedback is frequently mentioned as a tool to improve student achievement in a way that can be separate from a specific grade or score. Improving feedback is a research supported way to improve student performance and has been a focus of my curriculum development over the last four years. Offering excellent feedback forms the base of this investigation and project. Chapter three outlines the arc of the capstone project. This capstone created curriculum for a high school social studies unit with opportunities for useful formative feedback to be built in to each day of the unit.

To create time for formative feedback to occur, the curricular unit implemented a blended learning station rotation unit that used online ready devices as the content delivery tool and freed the teacher to engage in a more coach-mentor role based in effective feedback. In order to justify such a labor intensive transition for teachers both curricularly and regarding their classroom role, the research literature must justify the change. Therefore this chapter starts by explaining the research that supported these goals. The following section links those goals to a specific philosophical framework. Because not all high school social studies classrooms look or act the same, a more detailed examination of the audience and setting for this curriculum is made. The project itself is a unit long curriculum design and is described in this chapter, as well. Finally, there is a description of the timeline for project completion. Thankfully this project found wide-ranging and long-standing research to support its efforts, and the following section summarizes those findings.

Studies and Support

Chapter two provides a robust examination of the current research that supports a curriculum project that uses blended learning to increase formative feedback. Hattie and Timperley (2007) provided support that formative feedback, when done frequently and properly, can be one of the most powerful tools to increase student achievement beyond a normal classroom experience. Many studies document the positive impact of proper feedback (Pat-El, Tillema, van Koppen, & Sabine, 2012). But Bond, Smith, Baker, and Hattie (as cited in Hattie & Timperley, 2007) reported feedback is given infrequently even by well-trained teachers. This disconnect between the importance, and infrequent use of feedback makes creating opportunities

for formative feedback a clear imperative. Blended learning is a key way to create these opportunities.

Blended learning strategies like the station rotation model provide a helpful structure for classrooms looking to increase opportunities for feedback (Tucker, Wycoff, & Green, 2017). Implementing a blended learning station rotation unit model effectively gives students significant freedom and ability to work independently and with small group support. Pulhman and Graham (2018) have shown self-paced activities that are properly created and assigned give teachers more freedom and flexibility within classroom instructional time to meet with and provide student feedback. While this tool is helpful, it needs to be implemented in a way that supports student technology skill acquisition, also referred to as digital literacy.

Although most students have personal background using technology in their social and personal lives, Gallardo-Echenique, Marquies-Molias, Bullen, and Strijbos (2015) showed there is still a wide gap of skills and understanding that needs to be addressed in the classroom. Today's digital native students still need support in performing digital tasks from a classroom perspective and with academic rigor. Therefore the implementation of a blended instructional change like a station rotation model is very important. The introduction of the digital literacy skills necessary for success is the third focus of this curriculum design and the unit it creates. Tucker, Wycoff, and Green (2017) laid out a format called on-boarding to help teachers focus on building a curriculum that ensures all students have the digital literacy skills necessary for blended learning. This sort of on-boarding, sometimes called pre-loading or front-loading in other formats, is crucial so that regardless of students' background with any particular technology or tool, they have an opportunity to practice and ask questions before the actual

assignment or assessment begins. The term on-boarding that Tucker, Wycoff, and Green (2017) borrowed from the business world refers to "the practice of integrating new members into an organization" (p. 96). Tucker, Wycoff, and Green took this concept and use it within the educational lens by incorporating the Understanding by Design principles created by Wiggins and McTighe (2011) to build effective instructions and opportunities to practice so that student skills can be developed prior to implementation of the clearly stated learning goals for the unit.

Research by Hattie and Timperley (2007) and others discussed in chapter two suggested feedback is an important tool to support student achievement. Research by Powell et al. (2015) show that blended learning is a way that ensures there are more opportunities for feedback to happen. In order for students to find success using digital tools during a blended learning station rotation assignment, on-boarding or basic skill scaffolding needs to be in place to minimize barriers to entry for all students, regardless of their familiarity with digital tools. In order to implement a curricular project that utilizes properly on-boarded blended learning to facilitate formative feedback it must be grounded in a philosophical worldview that lends itself to this challenge.

Worldview Dictates Direction

Having a clearly articulated philosophical worldview is crucial to the epistemological and structural underpinnings of an academic endeavor. This project has grown out of a social constructivist perspective. Cresswell and Cresswell (2018) described the current understanding of a constructivist perspective to be ultimately guided by the reality of each individual's truth and understanding and inexorably guided by their own experiences, including their historical and social backgrounds. In other words, the social constructivist perspective is centered more around

open ended questions than a specific set of beliefs. Those questions lead to a better understanding of where individuals or groups are at in their development and understanding of themselves. This perspective is a powerful way to look at a classroom setting.

Blended learning is a classroom structure that tries to move the teacher from the front of the room lecturing and delivering content, to seated at a table with students, discussing their questions, challenges, and efforts (Powell et. al. 2015). This *seated at the table* perspective aligns well with a social constructivist perspective. Cresswell and Cresswell (2018) described this perspective as "the researcher's intent is to make sense of (or interpret) the meanings others have about the world" (p. 8). Blended learning shares this goal with social constructivists to hear students, and their experiences better. Along with blended learning, the idea of thoughtful feedback is also aligned with the social constructivist philosophy of reacting to individual students in their reality.

Crotty (as cited in Cresswell & Cresswell, 2018) noted a key assumption of social constructivism is that, "human beings construct meanings as they engage with the world they are interpreting." (p. 8). Feedback is itself a crucial form of "engagement" between teacher and student, so it is clear that any effort for more deliberate and effective feedback in the classroom aligns with a social constructivist philosophy.

This project is supported by the social constructivist philosophy. Questions, adaptations, listening, and flexibility undergird both the project and the philosophy that influences it. The final key is that social constructivists apply its same basic rules of engagement, understanding social and historical influences, and listening to reality rather than predetermining it, to the researchers themselves as well as the subjects or populations being worked with. This type of

honest reflection is the final support for this project. The project itself was guided by this philosophical principles and is described in the next section.

Setting/Participants/Audience

Students who will be participating in this curriculum unit are enrolled in a "special" school district meaning the boundaries of the city are the same as the boundaries of the district. The district is an open enrollment school district and attracts families from the surrounding areas because of its relatively small size, with graduating classes of 220-240 students, and its commitment to the International Baccalaureate programing for all grades (K-12). The district is located in a first ring suburb of a midsized metropolitan area in the upper midwest with a population of roughly 20,000 residents.

The racial diversity of the school is more diverse than the city itself. According to the state's education department website students who identity as white make up 55% of the student body, while the most recent U.S. Census data reports the city itself is made up of roughly 81% of residents who identify as white. Latino students are 27% of the student population, African Americans 7%, students who identify as more than one race is 7% of the population, and 2% of students identify as Asian Americans. Economically 46% of students qualify and apply for free and reduced lunch (Minnesota Department of Education, 2018).

Along with the racial diversity, there is a wide range of ages as well because the building is home to grades 6-12. The secondary building lags behind in consistent attendance by students: state average is 85% and this site is at 70%. The percentage of students in the building that received English Language Learner instruction is 3.2% (Minnesota Department of Education, 2018).

The district's graduation grates have remained in the 90-95% range over the last five years. The school's performance on the state's standardized math tests has trended downward over the last three years and last year was at 34% of students reaching proficiency. Reading scores have remained fairly steady near 48% proficiency rate. Science scores have trended downward and were most recently measured at 38% (Minnesota Department of Education, 2018).

The focus of this curriculum development is students enrolled in the 10th grade U.S. history course. This represents roughly 60-70% of the sophomore class. The department also offers an honors U.S. history course that has more rigorous expectations for reading content and writing complexity.

The audience itself helps dictate many specific curricular decisions. The school district that is the audience for this curriculum development project is fairly diverse economically and racially compared to its suburban neighbors. In the multiple ways the state measures school success this district can point to both successes and areas in need of improvement. In the next section the curricular development is described in detail.

Project Description

This section provides an overview of the curriculum project of a blended learning unit for a high school (10th grade) social studies classroom. The unit is split into three phases and may take twelve to fifteen class periods to complete in its entirety. The first phase is the on-boarding section of introducing the skills, content, and expectations for a flexible instruction model. The implementation of actual blended learning (station rotation) unit is the second phase. This second phase has built in several mechanisms to encourage formative feedback between the teacher and

small groups of students. The final phase is the summative assessment for the students, based on choice and a web-based video presentation which will be presented as a "mini-lecture."

The educator will be able to make informed decisions on student performance, and make necessary changes and adaptations for repeated implementation from the data drawn from the simple learning checks for phase one, through the two required feedback meetings called "Team Time" on the students' checklist during phase two, and with performance on the rubric for the final summative assessment during phase three.

This curriculum design has taken the form of a folder of electronically created materials on the Google Drive (https://drive.google.com) website (see Appendixes A-H). This type of curriculum design matches the norms and expectations of the district it will be created in. Curriculum within Google Drive is easy to enmesh in Google Classroom, a free LMS, and it is easy to share with other collaborators as well. While this station rotation model can be replicated in nearly any U.S. History content, the design will be structured for a one-time specific content unit of Civil Rights in post-WWII United States Minnesota state standards (Appendix B).

Phase one: introduction and on-boarding. The introduction phase one to this unit had three goals: introducing the content, attempting to create a strong level of engagement with students in the content, and to build familiarity and confidence with the students regarding the skills necessary to navigate a blended learning unit. Content and engagement introduction can be done a variety of ways due to the rich content available documenting the American Civil Rights movement from a variety of perspectives, including the award winning documentary "Eyes on the Prize," a variety of protest music popularized by different aspects of the movement, and the 2014 motion picture "Selma". The introduction of the skills necessary to have success in a

blended learning unit is described as on-boarding by Tucker, Wycoff, and Green (2017) and is described in a previous section of this chapter. The use of on-boarding means the unit must be examined for what technology based skills and understandings students will be asked to do on their station rotation and their summative assessment. Then educators must work backwards on creating introductory activities for students to familiarize and practice those skills. For example the summative assessment will asks students to give a mini-lecture on a Civil Rights topic by posting a video on the Flipgrid website (https://flipgrid.com/). In an introduction, the teachers should create an activity that allows students to use the website in a low pressure way, to ensure the tools and skills necessary to use the website are presented and practiced. Students could be asked to post a video to the Flipgrid website, sharing one goal they hope to do over Spring Break. This sort of practice does not require content mastery and allows students to familiarize themselves with the tools necessary to complete the unit.

The on-boarding necessary to complete this unit depends largely on how familiar students are with the variety of choice assignments available for each topic. In this case, students used the Learning Management System (LMS) of Google Classroom to access directions, research, and to turn in their work. On-boarding necessary for the utilization of the LMS will be minimal, as students are exposed to the LMS from the primary grades onward in their district. The digital tools that students chose among included Google Draw, Google Docs, Brainpop content website, and quiz creating websites Quizzlet, Quizziz, and Pear Deck (Appendix A). These tools are part of the digital learning practice activities students were asked to do as part of the blended learning station rotation. Some of these tools were introduced throughout the year prior to the particular Civil Rights unit and needed less instruction and practice. Student understanding and proficiency

with these tools can be assessed by the teacher on a phase one assignment referred to as the Digital Skills Assessment (Appendix E) that asked the students to follow simple introductory tasks with the digital tools. The learning practice activities were an important part of the on-boarding process as students came to the unit with various levels of comfort with the digital learning practice activity tools depending on how the tools were used throughout the school year.

Blended learning unit implementation. At the start of the unit students were given two versions of the organizing checklist (Appendix D), a digital format and a paper format. Students chose which format fits their learning preference best. The organizing checklist included the three phases that include five aspects total for the unit. One section on the organizing checklist was for the phase one tasks that all students were asked to complete. Three other sections were chosen by the student from a list of Traditionally Marginalized Groups (TMGs) who have faced discrimination in the United States and been forced to push for greater access to their Civil Rights throughout the history of the United States but specifically in the post-WWII time frame. Students chose among African Americans, Latinos, Women, the LGBTQ communities, or a TMG of their own choosing for their three TMGs. The curriculum had a collection of differentiated sources for the TMGs listed, and an option for students to follow their own research for other specific groups. For each of the three TMGs students chose to study, they were asked to complete one digital learning practice activity. These digital learning practice activities use a variety of digital tools discussed above (Appendix G). Each digital learning practice activity included specific directions but will be assessed using a universal rubric (Appendix C) that students will use to prove their understanding of the TMG they selected. As discussed previously, blended learning offers students the ability of more choice. This flexibility to choose

both the topics and the way to prove content mastery will hopefully increase student engagement.

The station rotation aspect was applied as students selected their three digital learning practice activities. Students were asked to sit at a table that corresponded to their activity choice. Each small group of students work on the same activity, even if they are not using it to understand the same TMG. This is another support, like on-boarding, to help students find ways to learn about and practice their digital skills. Being in a small group with similar goals, students ask each other questions, and see examples from their peers on how the digital learning practice activities can look.

Along with the required section of task in phase one and the three choice topics of TMGs in phase two, there will be a feedback section in phase two that includes two required meetings with the classroom teacher. These were accomplished in small groups or individually. Before each meeting takes place, students needed to have completed a baseline set of tasks so that the conversations between the students(s) and teacher can be based on their performance to date. This is the key aspect of the blended learning format that allows for specific, direct, frequent and formative feedback to be given, the benefits of which are discussed in chapter two.

Assessment and evaluation. Students were assessed on their understanding of the content by completion of the five tasks: the initial phase one onboarding and introduction activities, the three learning activities on three different TMGs, and the summative assessment of a mini-lecture. The mini-lecture was chosen by the student based on their TMG choises from phase two and requires a 60-90 second recorded presentation posted to a educational

video-sharing website, Flipgrid. Students will be provided with a rubric to outline expectations for the summative assessment (Appendix G)

This project utilized blended learning strategies to create opportunities for teacher formative feedback. Students were encouraged to move around the room during the unit of study based on their choice of a learning activity. In this way the station rotation model of blended learning was utilized. With small groups of students proving their learning in a variety of learning activities each student chose, the teacher's time during class was more flexible and allowed for meetings with individual and small groups of students. These meetings allowed the teacher to give specific and timely feedback both on the content and facts of the student's work, but also the process and skills the students used (Hattie & Timperley, 2007). The next section outlines how the capstone was completed.

Timeline. June 3, 2019 was the beginning of the course GED 8490, during which the curriculum design took place. August 4, 2019 was the self-assigned deadline for completion, as was necessitated by the beginning of preparations and commitments for the upcoming school year including extra-curricular activities. These parameters created an approximately 9 week period. There were three general tasks to address during this course: revising and improving chapters 1-3, planning and creating the curriculum design, and writing chapter four and final project completion. The first task of created a polished version of chapters 1-3 included partnering with my content expert and peer reviewer, as well as filling some weak spots on the reference list and ensuring accuracy with all APA formatting. Given the nine week course structure a two week goal for this period seems appropriate. The curriculum development itself was the most time consuming step, so four weeks of the project were devoted to that endeavor.

As explained above, the curriculum design used the powerful structuring of Understanding by Design (UbD). That allowed for chapter four and the final formatting to be completed in the three final weeks.

Summary

Chapter three worked to outline both the what and why of the curriculum design that were the project for this capstone. The audience that was exposed to this project was a specific group of students in traditional public high school which the chapter also described in detail. The blended learning curriculum unit featured a detailed introduction, allowing for students to familiarize themselves with the digital skills and tools they will need to use in order to prove content mastery. The curriculum offered a variety of choices for students on several levels, both on the topics researched as well as the way students practice showing their understanding (digital learning practice activities). They moved around the room in a station rotation based format based on the particular digital learning practice activities they chose, setting up a small group of students that may be able to support each other or answer questions when issues arise on the digital tools. The key reasoning for the blended learning station rotation format was to give the classroom teacher freedom to engage in formative feedback with each student multiple times. Finally, students had a summative assessment that featured a short (60-90 second) digital lecture on a topic they practiced earlier. The capstone question: *How can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* guided the creation of this curricular unit as improved feedback was the goal and traditional classroom blended learning was the tool to ensure that feedback could be offered.

Chapter 4 unpacks the powerful learning opportunities that this entire capstone experience provided.

CHAPTER FOUR
Conclusion

Introduction

Shoshin or *the beginninger's mind* is a goal of much of Zen Buddhism. The term refers to an individual's ability to approach events, learning, and life with an openness as if the individual is experiencing the situation for the first time, no matter how familiar or experienced one might be (Suzuki & Dixon, 1970). The capstone project was certainly a practice in this *beginner's mind* process. I had completed versions of the writing, research, implementation, and reflection necessary for this capstone, but because of the scope and depth of the process, I was forced to reenter familiar surroundings with the vulnerable but ultimately excitable beginner's mind. This capstone explored the question: *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* The melding of decades of research on teacher-student formative feedback and the emerging potential of internet-ready technology in the classroom referred to as blended learning challenged my perspective and teaching practice. The following chapter will attempt to synthesize what I took away from this complex and rewarding process.

This chapter reflects on the capstone from three different perspectives. The first section revisits chapter two's literature review. The literature review offered definitions and models for feedback and technology that helped shift my understanding from appreciating interesting ideas into specific actions and behaviors. After reviewing the research of chapter two, the next section will look at some of the key learning that took place with this capstone. As with any experiential

learning, sometimes the most important lessons are missed opportunities or failures. Finally, this chapter places this capstone at the beginning of a larger learning process. There will be ongoing changes to my own practice moving forward and this capstone can influence future research and action by the broader educational community.

One of the key ideas this process reinforced is that nothing in education happens in isolation. Students and teachers bring their own personal life stories into classroom interactions. Teachers search within their communities to find effective tools for content dissemination, skill development, and student support. There was an incredible array of research done by dedicated professionals that was necessary for this learning experience to occur. The following section looks at how their work influenced this capstone.

Standing on the Shoulders of Giants

Teachers can muse in the isolation of their classrooms all they want, but real change only happens with the support of the larger education community. The capstone question *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* clearly outlined two key aspects of necessary research: effective feedback and technology integration. Both threads provided key insights and even opened an essential third thread of research which turned out to be not just an unexpected addition but an equal leg of the triad of information necessary to develop an effective curriculum unit.

Two really powerful results to come out of the feedback research came from Hattie and Timperley's (2007) work. Their detailed four part definition of feedback, included task level feedback, process level feedback, self-regulation feedback, and self feedback (Hattie &

Timperley, 2007). This complex definition really signaled that the push to improve feedback was not going to be as simple as ensuring teacher comments got back to students within a week, or that the feedback given was specific to their work. Hattie and Timperley (2007) were able to nuance the act of giving feedback that highlighted its complexity, but also because of its specificity, it became more clear and therefore achievable. The second part of Hattie and Timperley's (2007) research that was motivating argued that effective feedback rarely occurs in classrooms, even by dedicated and certifiably excellent teachers. If the best teachers in the United States still found it difficult to give frequent effective feedback, then it truly was a problem that needed to be addressed structurally. The ability to change the structure of a classroom has been greatly improved by access to internet-ready devices in classrooms for all learners.

The research into truly effective technological changes in the classroom, called blended learning, provided both a structural response to the challenges of the feedback research and also the most broadly transferable learning from this research. It must be noted that internet-driven technological interventions in classrooms like blended learning still remain limited in many places and have not been around long enough for conclusive research into its effectiveness. There remains much debate and discussion about the successes and challenges it presents. However, the research of Powell et al. (2015) is at the root of this capstone. It suggests that classroom changes such as a move to blended learning could fundamentally shift the role of the teacher away from content delivery and into the role of mentor-coach during the learning process. This change can come about because blended learning allows students to access content in a variety of ways with differentiation more independently than in a traditional classroom

format. The individualized flexibility of content that students have access to with blended learning can free up teachers' time to provide feedback, especially the type of feedback that Hattie and Timperly lay out in their research. Attempting to answer the question *what should the role of a teacher be?* is a transformative result of this capstone, and the question is valid whether referring to a 1:1 device classroom or not. This is the revelatory question that can guide reflection in the classroom practices from providing students feedback, to grading, to how to access and encourage student creativity. This question is the root of positive change in my classroom moving forward. The role of the teacher should always be considered in its relationship to students, and the final thread of the research clarified a key characteristic of students in the digital age.

The final and unexpected thread of the research involved an examination of the term digital native. This research by Prensky (2006) and Tucker, Wycoff, and Green (2017) confirmed what my own individual experience as a classroom teacher suggested. Students who have had early access to digital tools are comfortable with using internet-ready devices for a few, very specific tasks, but they are lacking in a broader sense of *digital literacy* as described by Martin and Roberts (2015). Because of these lagging skills, introducing blended learning into a classroom requires a significant amount of teaching students expectations and how to use specific digital tools in order for the blended learning to have the desired effect of opening up classrooms to more flexibility. Using the *on-boarding* framework discussed by Tucker, Wycoff, and Green (2017) was a necessary part of this capstone development that was initially an unexpected part of the workload.

Effective feedback, blended learning, and digital literacy via onboarding were three complex issues that chapter two's literature review attempted to build a solid foundation to explore from. The following section will show how this information was used to create the curriculum unit of this capstone project.

Rome Wasn't Built in a Day and Neither was this Capstone (Learning. Limitation. Sharing.)

As discussed in the introduction to this chapter, the Buddhist phrase *the beginner's mind* really framed this capstone experience. Each aspect of the process required me, sometimes with great difficulty, to come to a new appreciation of the skill, demand, or practice asked of me by the experience. Whether it was scheduling, research, writing, or reflecting, I grew as an educator through the process, successes, limitations, and failures of this capstone.

One key success to come from the research aspect was dispelling a falsely held belief that much of educational research could not directly improve my teaching practices. The articles used in chapter two were not all about p-values and standard deviation, nor were they wrapped in theoretical debates about concerns outside the control of the classroom teacher and students. Over and over again the research provided simple, direct, applicable evidence or strategies for high school classrooms. Of course this revelation forced me to reflect on how or why I came into the process with such a negative view of educational research. Have I improved in my ability to synthesize such information with my own classroom experience? Had I been intimidated in the past by educational research? Had I failed to engage in rigorous enough searching for applicable articles? Regardless of the root of my lack of interest in educational research in the past, this experience proved to me that educational research contains answers to questions and problems I

am having in my classroom if I take the time to find the proper sources. This capstone not only opened my eyes to the benefits of educational research, it also provided me with a renewed and deeper respect for the role of student in the classroom structure.

This experience was intellectually demanding. I truly was pushed into new realms as a learner and needed to ask for help. These challenges helped remind me of and more deeply respect, the challenges of being a student in my classroom. From the practical challenges of balancing a schedule and meeting deadlines, to the learning of new skills related to APA citation and utilizing web based tools like RefWorks, I absolutely had to struggle in a sustained way. I certainly encounter daily struggles as a classroom teacher, but my eleven years of experience also ensure some continuity and some success along with the challenges in a way that makes the uncertainty of the outcomes much less intimidating than this process was. Of course intellectually I know and appreciate that it is through these types of challenges that true learning and significant growth occur, but parts of human nature also push individuals to avoid these types of learning experiences if at all possible. There was no avoiding these challenges in this capstone and I had to enter them with a beginner's mind, once again finding how to navigate waves of frustration and confusion. One of the key ways I entered into the beginner's mind was to start the curriculum writing process reexamining the digital skills necessary to on-board students with.

As discussed in the previous section of this chapter the idea of *on-boarding* or pre-teaching digital skills in a blended learning classroom is described in the research as essential but was not part of my original vision for this capstone. This seemingly simple practice of identifying and allowing for the practice of important skills is the type of reflection that can be

opened into all aspects of the classroom environment. We cannot demand anything of our students, from behavior to performance, unless we have clearly instructed them as to what success looks like and allowed them to practice it. For example a failure of students to participate with an in-class discussion is just as likely to be because they haven't been taught how to speak in a discussion as it is to attribute the behavior to apathy or unpreparedness. If we want students to do something, we must give them the tools and examples to perform it well. This lesson of the importance of onboarding is as relevant to blended learning as it is to an expectation for arriving to class on time. An observation that starts with a specific lesson that leads to a broader or more general lesson is the ultimate value of true learning. When we begin to see our learning in other aspects of life or different processes, we have truly internalized and *learned* the information. This ripple effect of learning applies not only to the points of success of the capstone but also to the places where things fell short or fell victim to limitations.

Challenges

While at times I felt overwhelmed with the scope of this capstone, in reality it was a very measured dipping of the toes into the world of academic research. Because of the structure of the capstone and my dual role as researcher and classroom educator, there were clear limitations of this capstone.

Time played a limiting factor on two aspects of the project. First of all, chapter two was a sincere and extensive review of the literature. But because two of the main research topics: blended learning and feedback are the focus of much attention in current education circles, and have been researched for decades respectively, there is no way given the structure of the capstone that all of the literature could be reviewed. Another way time played a limiting role for

this experience is the fact that the curriculum developed could not be fully implemented. A full implementation of this curriculum unit design could have yielded unique reflection and undoubted improvements to the project.

Another limitation that was important for the experience but must be noted is the individualized format. While I always felt supported from a variety of parties, including professional colleagues and the faculty at Hamline University, the actual experience was worked on relatively independently. This garnered some transformative learning outlined in the previous section, but it is also meant that some of the important synergy that comes from professional cooperation and teacher community efficacy were not fully realized. In my past experience writing curriculum with other colleagues, there are always opportunities for perspectives and improvements made through dialogue and brainstorming that simply can't be achieved by an individual, no matter how reflective the individual may be. The capstone's structure of independence was a challenge as was its specific format.

Because I have spent so much time writing as a student of history and as an educator in history, confidence in my writing skills have become a strong part of my intellectual identity. This capstone represented a significant change in the type of writing I was asked to do and it provided a humbling practice that is necessary for one's writing to improve. The format, the size, and the subjects covered all pushed my writing in new directions. The professors did an excellent job providing opportunities and assignments to read and reflect on other colleague's capstones, but even with that experience my unfamiliarity with the format proved to be a real challenge to the pacing and the style of the writing expectations. Strong editing support from a variety of sources, as well as persistent practice enabled me to create a capstone that is written in a way that

I am proud to attach my name to, but this capstone definitely represents a significant milestone for my development as a writer.

This capstone was an incredible experience personally and professionally. The curriculum unit developed is something I can be proud of and will certainly be able to apply to improving my instruction next year. But the humbling experience of entering into such a long term, challenging endeavor opened up some perspectives as an educator that needed refreshing, such as appreciating the work of the academic educational community through helpful research papers, the reminder of the vulnerability and stress related to the role of student rather than that of the teacher, and the sound structural practice of reviewing and reflecting *on-boarding* or *front-loading* key skills to students before they begin a task or assessment. Because of the confines of time, ability, and scope of this capstone, there were limitations to the project that left aspects for further study and collaboration under-explored. This section focused on the impacts this capstone on my experience and the situation in my own classroom. The following section will place this capstone in a broader context both as a springboard for me personally and for its place in the wider dialogue in the educational community.

From Where We Stand: Broader Implications

The previous section reflected on the ways this capstone impacted myself as a researcher and my classroom. Even for the autodidact, education does not occur in a vacuum. There needs to be a dialogue and an application to the broader world. Fitting this capstone into the wider puzzle of secondary education is another exciting aspect of the completion of this capstone.

On the most practical level, there is a full unit of curriculum that gives students the freedom to explore aspects of the brave push of traditionally marginalized groups in the United

States to fully access their Constitutionally stated civil rights after World War II. This is a rich aspect of United States history that contains many opportunities for questions and discoveries that connect learning directly to the challenges of today. I hope that other U.S. History teachers could review this unit design and take aspects or the entire format and apply it directly to their instruction. I certainly look forward to utilizing this curriculum unit in my teaching in the future. The topic of post-World War II civil rights in the United States is always a daunting curricular challenge because of its complexity and breadth. The flexibility and diversity of this unit design offers answers to a variety of challenging questions teaching this unit always presents.

So much of this experience has revealed itself in expanding concentric circles. The research question provides the basis, but as the exploration continued there were more and more questions and tools that got pulled into the discussion. To start with my own personal development as a learner, writer, and educator, and then expand to impacts on my classroom and students, and then see opportunities for me to address these issues in professional learning communities, grade level meetings, and informal and formal collaboration in my building, to the broader education community that I am linked to digitally and through my relationship with Hamline University. These expanding circles help remind me both of my own opportunities for dialogue and growth but also my responsibility to actively take part in furthering discussions.

I am much more aware of the complexities and power of formative feedback between teachers and students. I am excited to use this developing perspective to be a conduit for improved discussion with colleagues. One specific way this may help spur dialogue is to address *lagging adopters* within my building as it refers to technology integration. Many teachers, regardless of age, see their hard-earned comfort with content and classroom routines to be a

permanent set point. Any further technology integration to the classroom for these *lagging adopters* is seen as disrespectful of their professional expertise and hard work. I worked hard to structure this capstone in a way that viewed technology as a tool to reach a more universal goal. As discussed in chapter two, technology integration is often introduced to create a *tech rich* environment that simply augments realities and routines that are already in place. I hope this capstone can be used as a way to encourage lagging adopters to see technology not as another initiative to disrespect their finely honed professional practice but as a tool to solve problems they themselves articulate as sources of frustration.

This capstone represents one of many bridges between the excellent work of academic researchers like Hattie and Timperley and practical classroom application. As discussed in an earlier section of this chapter, I was embarrassed to find how incorrect my assumptions were about the accessibility of educational academic research, I found a significant amount of research to be directly and immediately applicable to the classroom teacher. An area for growth and further development by me and the broader educational community is to find specific ways to universalize the work of researchers who have found what type of feedback works in specific situations. Scripts and formats can be further developed to make this even easier for classroom teachers to feel confident implementing the results of the rich research body of work.

Another important next step for both me and the broader community is to monitor the impact of technology on our classrooms and students' lives and performance. Of course this issue is applicable in nearly every aspect of human life right now, but we are woefully unaware of what the long term impacts a lifetime of exposure to technology will mean for our lives, our brains, and our relationships. This capstone attempted to outline potential short and mid-term

benefits of blended learning. Opportunities for more student choice, easier differentiation, and space for teacher-student feedback are all possible benefits of a specific kind of technology integration in the classroom. Questions of digital literacy seem equally as important as the other benefits, because in order to control the impacts of technology use on our lives as best we can, we must understand the technology tools as clearly and deeply as we can. There is no clear answer to concerns about technology's influence on our lives, because all of the problems are not even obvious to us at this point, but there must be a clear dedication to ensuring our developing relationship with these powerful technologies be entered into with open eyes and a critical mind.

Completing this capstone doesn't represent the end of an experience but rather a transition. With the capstone completed, I have taken steps forward to be a more competent researcher, writer, and educator. And my role within educational communities both locally and more broadly offer opportunities for me to take this new confidence into my interactions and the capstone and project themselves is of a high enough quality that I feel comfortable that it stands alone as an opportunity for other educators to enter into dialogue with themselves and the document to address questions of technology implementation and feedback.

Summary

This chapter sought to reflect on the process of the capstone. The process was guided by the question *how can a blended learning station rotation model be used to provide opportunities for teacher-sourced formative feedback at the high school level?* This question led to a review of the academic literature investigating blended learning, effective formative feedback, and the evolution of digital literacy. This review of the literature led to a deeper understanding of each of the threads of research and also a better appreciation of the application of academic research to practical classroom practice. The work of translating the research into a curriculum unit created a

better understanding of the complexity of effective formative feedback as well as the importance of developing proper on-boarding or front-loading of behavior and performance expectations. The ultimate result of the process is a feeling of confidence as an educator and researcher and better connectedness to the broader educational community both locally and more generally. It is easy to imagine a further unwrapping of ways this experience impacted me personally and professional, especially as I return to the classroom in the fall.

This capstone project demanded a level of time, intellectual focus, and emotional flexibility that helped stretch me and led me to a new level of confidence as an educator. One of the reasons I feel so fulfilled as a high school educator is I really see the experience of high school as a multi-layered developmental experience. From the social and athletic, to the artistic and academic, high school is such a challenging and important period of growth for students that it is an honor to be walking alongside them during that time. While my capstone experience was much shorter than the average high school career, I still feel it had a real uplifting experience for me personally and professionally. It demanded that I be a direct and frequent communicator with my partner as we juggled family and professional responsibilities along with my academic pursuit. I found a better appreciation for the challenges of my own students as they juggled the expectations of six or seven different teachers on any given day, each of whom had unique descriptions of success and behavioral expectations. I had weaknesses in my own classroom structure exposed and the solutions to those weaknesses were offered through the work and discovery of the same process that exposed the weaknesses in the first place. From a holistic perspective this was a fruitful experience. It solidified my commitment to secondary education, made me a more complete professional, and pushed me to better articulate and describe personal

and professional boundaries. I am grateful for the results and the formative experience this capstone provided me.

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APPENDIX A

Websites used in curriculum unit design

- Learning Management System (LMS)
    - In this case the curriculum design was created using Google Classroom (classroom.google.com) but Schoology, Cavans, Moodle, etc. are also applicable
- Several of the Google Suite of online tools were used.
    - Google Docs
        - A word processing tool
        - docs.google.com
    - Google Draw
        - A single page digital presentation tool
        - draw.google.com
    - Google Forms
        - An online quiz/checklist creator
        - Forms.google.com
- Brainpop (optional)
    - A paid subscription site that utilizes a variety of online tools (reading, video, primary source documents etc.) to explore topics and historical figures
    - Brainpop.com
- Kahoot (optional)
    - One of many free services that allows individuals to create review tools for a specific topic using multiple choice questions
    - Getkahoot.com
- Quizlet (optional)
    - One of many free services that allows individuals to create and share online flashcards to review a specific topic
    - quizzlet.com

APPENDIX B

Minnesota State U.S. History Civil Rights Standards

9.4.1.2.1. Pose questions about topics in history; suggest possible answers and write a thesis; locate and organize primary and secondary sources; analyze them for credibility and bias; corroborate information across the sources; use sources to support or refute the thesis; and present supported findings.	9.4.4.22.5. Explain the roots of the various civil rights movements, including African American, Native American, women, Latino American and Asian American. (Post-World War II United States: 1945-1989)	9.4.4.22.6. Identify obstacles to the success of the various civil rights movements; explain tactics used to overcome the obstacles and the role of key leaders and groups. (Post-World War II United States: 1945-1989)	9.4.4.22.7. Evaluate the legacy and lasting effects of the various civil rights movements of the 1960s and 70s; explain their connections to current events and concerns. (Post-World War II United States: 1945-1989)	9.4.4.22.8. Identify the changes over time in federal American Indian policy in terms of sovereignty, land ownership, citizenship, education and religious freedom; analyze the impact of these policies on indigenous nations. (Post-World War II United States: 1945-1989)

APPENDIX C

Rubric for phase two and phase three

Rubric: **How do I prove my understanding?**

Each portion of the assessment will be graded with our 8 point scale and will focus on three main aspects

- ❏ How well did I follow the directions for this specific assignment?
- ❏ How well did I incorporate specific facts/information/examples?
- ❏ How well did I create something of quality, with attention to detail such that if an audience had to read/watch/see my work they would appreciate my **engagement** and effort?

Score	Descriptor
1-2	❏ I was not able to follow most of the directly accurately ❏ I rarely added specific facts/information/examples from the topic I was studying ❏ If I shared this with an audience they would struggle to see sincere effort on my part
3-4	❏ I followed some of the directions well but some of the directions were not followed very accurately ❏ I added a few specific facts/information/examples from the topic I was studying ❏ If I shared this with an audience they would see some evidence sincere effort on my part
5-6	❏ I followed most of the directions well but a few of the directions were not followed very accurately ❏ I added several specific facts/information/examples from the topic I was studying ❏ If I shared this with an audience they would see sincere effort on my part
7-8	❏ I followed almost all of the directions well ❏ I added many specific facts/information/examples from the topic I was studying ❏ If I shared this with an audience they would see sincere and impressive effort on my part

APPENDIX D

Checklist/directions for unit overview

https://forms.gle/ReCgxLDJWQXQUbhe8

Civil Rights Buffet Checklist

You will refer back to this checklist MANY TIMES throughout this unit. You are not expected to answer ALL of the questions today (or even this week).
* Required
Email address *
My first name is *
My last name is *
The period I have U.S. History is *
Mark only one oval.

- Period 2
- Period 3
- Period 4
- Period 5
- Period 6

Topic #1: Required Work - All students must complete all three parts of Topic #1 (check off each box below as you complete it)
Check all that apply.

- Digital Skills Assessment (Google Form)
- Project Basics (watched flipped lesson AND complete Google Form Fact Check)
- Civil Rights Myths (watched flipped lesson AND complete Google Form Fact Check)

Traditionally Marginalized Group #1 (TMG #1)

You've chosen three Traditionally Marginalized Groups (TMG) also known as "groups of Americans that haven't always been treated as "full citizens" legally and within the culture."
Name of the Traditionally Marginalized Group (TMG) #1
Mark only one oval.

- African Americans
- Latinx (Latinos)
- Women
- LGBTQ

- Your choice (https://docs.google.com/document/d/10O7VX0XVNXThGpCBoBEBeVUKplA_AHdocuPaluBBtCs/edit?usp=sharing)
- Other:

Which Learning Activity will you complete to show your new knowledge about this TMG? You do*not*have*to*decide*this*today. Feel free to leave it blank and come back after you've done some research
Check all that apply.

- Paragraph Summary
- Google Draw Digital Poster
- Artwork
- Student designed study tool (Quizlet, kahoot, etc.)
- Brainpop Movie + Quiz
- Asynchronous Discussion
- Other:

Traditionally Marginalized Group #2 (TMG #2)

You've chosen three Traditionally Marginalized Groups (TMG) also known as "groups of Americans that haven't always been treated as "full citizens" legally and within the culture."
Name of the Traditionally Marginalized Group (TMG) #1
Mark only one oval.

- African Americans
- Latinx (Latinos)
- Women
- LGBTQ
- Your choice (https://docs.google.com/document/d/10O7VX0XVNXThGpCBoBEBeVUKplA_AHdocuPaluBBtCs/edit?usp=sharing)
- Other:

Which Learning Activity will you complete to show your new knowledge about this TMG? You do*not*have*to*decide*this*today. Feel free to leave it blank and come back after you've done some research
Check all that apply.

- Paragraph Summary
- Google Draw Digital Poster
- Artwork
- Student designed study tool (Quizlet, kahoot, etc.)
- Brainpop Movie + Quiz

- Asynchronous Discussion
- Assignment: Who Was Malcolm X
- Other:

Traditionally Marginalized Group #3 (TMG #3)

You've chosen three Traditionally Marginalized Groups (TMG) also known as "groups of Americans that haven't always been treated as "full citizens" legally and within the culture."
Name of the Traditionally Marginalized Group (TMG) #1
Mark only one oval.

- African Americans
- Latinx (Latinos)
- Women
- LGBTQ
- Your choice (https://docs.google.com/document/d/10O7VX0XVNXThGpCBoBEBeVUKplA_AHdocuPaluBBtCs/edit?usp=sharing)
- Other:

Which Learning Activity will you complete to show your new knowledge about this TMG? You do*not*have*to*decide*this*today. Feel free to leave it blank and come back after you've done some research
Check all that apply.

- Paragraph Summary
- Google Draw Digital Poster
- Artwork
- Student designed study tool (Quizlet, kahoot, etc.)
- Brainpop Movie + Quiz
- Asynchronous Discussion
- Assignment: Who Was Malcolm X
- Other:

Final Assessment: Mini-Lecture

The directions for the mini lecture are below. Check off each box to ensure you've included each part
Check all that apply.

- Between 60-90 seconds long
- Describes at least one specific type of discrimination this TMG faced
- Describes at least one specific strategy this TMG used to defeat this discrimination

- Includes at least one fact/statement/idea about the push for this group's civil rights that might surprise or interest the audience
- Presented with frequent eye contact and a clear voice volume
- Video is recorded in a place that doesn't have significant visual or auditory distractions

The rubric to score your min-lecture on flipgrid is here: https://docs.google.com/document/d/1TFIL3MK5Qeen_HL2qUwtQe4_LdXqWqoERs_dNkGr98c/edit?usp=sharing What score would you give your mini-lecture?
Mark only one oval.

- 1-2
- 3-4
- 5-6
- 7-8

Reflection

Click on this link and finish the reflection: https://docs.google.com/forms/d/e/1FAIpQLSf2eoSDbTu6dJoK6EtNdtQyee9HonUdyCif0_x4SucYX564rw/viewform?usp=sf_link Did you complete the reflection?
Mark only one oval.

- Yes
- No

A copy of your responses will be emailed to the address you provided

APPENDIX E

Curriculum Phase #1 - On-Boarding

Link to documents:

https://drive.google.com/drive/folders/1d-XCA41hLg80pzI5h12lE9dyKEvw7iGT?usp=sharing

- Including
- Note Taking Form (with link to youtube flipped lecture)
- Note Taking Key
- Formative assessment: Fact Check: Civil Rights Myth (Google Form Quiz)
- Checklist/Directions overview

APPENDIX F

Curriculum Phase #2 - Research and Learning Activities of Traditionally Marginalized Groups

Link to documents:

https://drive.google.com/drive/folders/1XKjWltMTm26JpLVlz8EnxxvBzPVvDIja?usp=sharing

Including

- Research resources for each TMG
- Learning Activities for each TMG

APPENDIX G

Curriculum Phase #3 - Summative Assessment - Flipgrid Mini-Lecture

D. Civil Rights Buffet Unit: Mini-Lecture

What?	How?	Why?
You will give a "mini-lecture" on ONE of the TMGs you've studied the lecture will: ❏ Be between 60-90 seconds long ❏ Will describe at least one specific *type* of discrimination this TMG faced ❏ Will describe at least one specific *strategy* this TMG used to defeat this discrimination ❏ Will include at least one fact/statement/idea about the push for this group's civil rights that might surprise or interest the audience ❏ Be presented with frequent eye contact and a clear voice volume ❏ The video will be made in a place that doesn't have significant visual or auditory distractions (no posts from the lunchroom or a rock concert despite flipgrid's phone app allowing you to do this)	Students will post to Flipgrid using the code posted below. If Flipgrid isn't a possibility students will email Mr. Kennealy to set up a separate presentation time Flipgrid Codes ● . ● . ● . ● . ● .	● Truly ENGAGED students can explain their learning in their own words ● Speaking in front of a group and/or on a video chat will be an important part of MANY "adult" jobs

APPENDIX H

Student Self-Reflection Survey

Link to document: **https://forms.gle/4cpUdTp146KKRtag8**