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The Role of Integrated Curriculum in the 21st Century School

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Abstract

In schools across the country, there appears to be an increasing focus on 21st Century

Skills development. While there may be some variance among specific definitions of

these skills by national groups and individual schools, review of the literature has

identified eight common features among widely accepted frameworks: creativity, critical

thinking, problem-solving, communication, collaboration, digital literacy, social and

cultural skills, and self-regulation. It is proposed that integrated curriculum should be

considered an ideal method for the teaching and learning of 21st Century Skills. While

neither the collection of skills designated as "21st century" in and of themselves, nor the

integrated curriculum are novel ideas in education, there appears to be a gap in related

literature studying the complementary relationship of the two. Surveys were conducted to

measure frequency of practices associated with the integrated curriculum and teacher

attitudes related to 21st Century Skills. Teachers were interviewed to identify practices

and attitudes, providing data for mixed-methods analysis. An interrelationship between

the integrated curriculum and the teaching of 21st Century Skills as well as barriers to

best practice were identified.

Keywords: 21st Century Skills; integrated curriculum; curriculum planning;

curriculum implementation; best practices; secondary education

Dedications

Kim: Author 1

My work for this project is dedicated to my muses, Zachary and Landon. They are the *why* behind every ounce of effort I put forth. Just as important as the *why* is the *how*, and none of this would have been possible without my Joshua. Ours is a true partnership which has allowed me to balance work, school, and home life. Thank you for loving and supporting me through it all!

Rob: Author 2

I would like to dedicate this work to my family whose love and understanding allowed me to make this dream come true. To my children, Micah my rock, Robbie my inspiration, Adam my prodigal son, Jack my gentle soul and to Tommy my heart. Also to my grandchildren Sophia, Clara, Amelia, Knox, Grace and those who are still with God. To my wife Barbara who is my anchor, my best friend, my everything. Finally, to my late father, for teaching me what it means to be a man, I miss you and love you.

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Chapter 1.

Introduction

The compartmentalization of subject areas has been common practice throughout typical schools in the United States for well over a century. While this tradition has been examined, and changes and reorganization have taken place over the decades, much of the original segmentation of academic disciplines has been maintained. And for what purpose? Thomas Paine (2004) stated in, *Common Sense*, that, "Time makes more converts than reason" (p. 45). Thus, the time invested in the current organization of content areas, and our deeply held ideas of what school ought to look like, have made it difficult for practices such as the integrated curriculum to gain footing. This seems to be especially true at the high school level, even as approaches of the integrated curriculum produce benefits that include improved student enthusiasm and motivation (Bishop & Berryman, 2009; Fraser, 2000); rationalizing the need to learn specific content by focusing on transferability (Baker & Daumer, 2015; Beane, 1997; Draghicescu et al., 2013) ; as well as the potential to do better on standardized tests (Vars & Beane, 2000; Fraser, 2000) even those aligned with Common Core State Standards that support interdisciplinarity (Petroelje & Frambaugh-Kritzer, 2014).

Perhaps now more than ever, there is a growing educational environment that is conducive to the implementation of the integrated curriculum as the focus of 21st Century Skills-based instruction increases. Research and synthesis of the literature indicate that the integrated curriculum has three key features: consideration of the real world, authentic connections among content areas, and negotiation of content with students. These features are ideal for supporting students as they learn 21st Century Skills. Literature appears to support the idea that 21st Century Skills, for the most part, are not in

fact new; however, successful practice and attainment of such skills may require a redesign of curriculum that is traditionally compartmentalized and disconnected from practical applications and relevant experiences of students. For example, problem solving skills have traditionally been practiced by students in an abstract, removed context; whereas the 21st century expectation requires, "decision making and metacognitive strategies" that are developed to transfer to situations in the real world where no simplified, situational approach may be applied (Dede, 2009, p. 3). If we continue educating students with the same methods and siloed structures, we run the risk of leaving them ill-prepared for the increasing demand of creative thinking and transferable, critical problem-solving skills outlined with other key attributes of the frameworks for 21st Century Skills. "Information is dangerous when it has no place to go, when there is nothing to which it applies, no pattern to which it fits, when there is no higher purpose that it serves" (Postman, 1993, p. 63). The integrated curriculum provides opportunities for teachers and students to apply and transfer information, but also supports the development of skills to use beyond the classroom to best serve the needs of our ever-changing 21st century world.

Therefore, an integrated curriculum provides an ideal learning environment for students to learn 21st Century Skills. We have, however, identified through our research and personal experience that there are several barriers causing the limited implementation of an integrated curriculum, thus hindering the best delivery of instruction for 21st Century Skills development. Among these barriers we find that long-held beliefs and attitudes about education, including traditional curricular design; ambiguous terminology associated with the integrated curriculum; along with economics and standardized testing

to be the most significant obstacles to integrated curriculum. We address these barriers

with greater detail in the following chapter.

Personal Interest and Background

As secondary educators, we both have a commitment to exploring and

implementing best practices for high school students. While each of our motivations for

choosing this topic of research may be unique to our separate experiences in the

classroom, we have come to appreciate the integrated curriculum model not only for the

success that we have seen firsthand; but also for the potential that we believe that it holds

for preparing students to be successful, well-informed contributors to the 21st century.

Author 1. I discovered about halfway through my second year as a high school

Spanish teacher that instruction through the traditional paradigm not only didn't match

my personal style and creativity, it was not yielding the results that I had hoped to see in

my students. Teaching students to think more *about* the language, grammar driven, than

in the language, performance driven, was a reflection of how I had been taught. Clearly

having content knowledge is necessary for the target performance; however, I found

myself steadily experimenting with the balance of content and skill that was practiced

and assessed in my classroom. This required more research and planning, which lead to

my discovery of the Framework for 21st Century Learning (P21), as well as topics related

to integrated curriculum. While at the time I did not establish the connections between

the two that we will describe in our conceptual framework and throughout our research, I

did find that referring to 21st Century Skills and considering a more integrated design of

my curriculum forced me to consider the bigger picture of student learning. Though this

my instruction changed and undesirable classroom behaviors dissipated as engagement,

interest and motivation increased; what's more, students were reading, writing, listening and speaking with greater fluency and accuracy. Certainly, a large part of my increased success in the classroom had to do with that which naturally comes with experience, including a more developed knowledge of content and pedagogy, classroom management strategies, a toolbox of various methods for instruction and assessment. However, as I continue to research 21st Century Skills and integrated curriculum for this dissertation, I attribute the success of my students in large part to the ideas and strategies that are the focus of this paper.

It is important to point out that I recognize that I had an ideal situation as a foreign language teacher to employ the strategies mentioned above. Language learning provides many opportunities to explore various topics, paving the way for collaboration with other content experts, as well as student interest, and build transferable skills, communication and interpretation strategies are helpful in most areas of life. Therefore, I do not presume to tell all teachers in their current situation, "If I can do it, so can you!" Especially considering the barriers to the integrated curriculum that we discuss throughout this paper. However, I will argue that, as educators, we all need to remind ourselves of the fact that humans like to explore and find connections; and yet many schools seem to hinder this natural inclination for learning by framing content into superficial and disconnected disciplines. According to Gregory & Kaufeldt (2015), "School is probably the least responsive evolving institution in today's society, clinging to the factory model instead of the thinking model" (p. 146).

It is also important to acknowledge that while we will point out various connections among best practices aligned with the 21st century framework and integrated

curriculum, these two terms in and of themselves may dissuade some readers. While I am not particularly bothered by educational jargon, I personally know many teachers that despise it and are automatically put-off by whatever is the new term or perceived fad. I believe that *integrated curriculum*, and 21st century may have fallen into this category of perception. However, the frameworks and features that we will describe are not necessarily new. Oftentimes they are recurring ideas that have been around for decades. Therefore, I will agree with my anti-jargon colleagues in saying that repackaging doesn't make the product better-- We need a better product itself. I am hopeful that this study will develop a conceptual model, supported by our research and analysis, for implementing an integrated curriculum to improve the product of 21st Century Skills.

Author 2. In 2007, I joined the faculty at a high school in a small urban district located on the border of St. Louis City with a free and reduced lunch matrix in the 70 percent range. The district began a cycle of decline in the 1970's and by 2000 was in danger of losing accreditation. In 2000 a major reclamation project for the area and the school district began with the election of a new school board and superintendent. The new superintendent had a comprehensive and progressive vision on how to turn the district around. This vision included a radical shift in curricular direction. The renovations of the physical structure of the school started in 2003 when voters approved an $8.6 million bond issue to fund renovations at the high school. However, this wasn't the typical new roof and a paint job, this was a renovation with a curriculum strategy in mind. The idea was to create learning spaces that supported technology in every space and the integration of curriculum between disciplines.

I joined the staff just as the renovations and new learning spaces were being finished. The first day, I remember the stark contrast between the 1920's brick architecture on the outside and the 21st century modern spaces on the interior. Gone were the traditional student desks in rows, replaced with tables designed for cooperative learning. There were no teacher's desks in the classrooms, teachers had shared planning areas separate from the classroom.

The first few months of teaching went as well as can be expected for a teacher in a new school, with many ups and downs. Ours was not your typical superintendent, she had a very hands on approach. For example, each discipline or Curriculum Action Team (CAT) had an administrator to lead the team. The Humanities Team, which I was a part, the superintendent herself guiding the team. In October 2007 at a department meeting, the superintendent directed us to bring our curriculum binders and the first agenda item was to put the binders in the trash. Shocked, we all proceeded to follow her instructions. This was the next step in the journey, out with the old linear curriculum and in with the new holistic curriculum. The idea was new to most of the staff and revolutionary to a new teacher like myself. The goal was to integrate the previously siloed disciplines into a new, and at the time, controversial, connected learning path that reflected real world situations. This curricular journey challenged many with traditional mindsets; some teachers resisted the change, looking at this as just another gimmick or hoop to jump through. We had to be creative, logical and collaborative; as well as digitally literate to keep up with the school's new one-to-one initiative. Textbooks for many in the school became relics of the past. Infusing technology into lessons was supposed to be transformative and not a novelty, it was the expectation and a goal for all instruction. After two years of revisions,

we presented our new curriculum to the school board. The board's reaction was a mix of astonishment at the progressiveness of the work, tempered with a dose of practicality. In others words, would it work? The next step was implementation, which came with its own set of challenges.

This new holistic curricular approach forced a paradigm shift in teacher planning and pedagogical practices. Teachers who spent all their time locked away in their discipline silos had to peer out and communicate with others. For the first time, teachers had to not only be masters their own content, they had to have a general understanding of how it fit within the other disciplines.

One of the most immediate noticeable changes was with the culture of the school. There was a palpable shift from a culture of complacency and apathy to a school of academic success. The internal indices showed a 700 percent reduction in discipline referrals from 2009 to 2015. Externally, the matrix that high schools in the state of Missouri are measured, ACT scores, End Of Course (EOC) testing and Adequate Yearly Progress (AYP) scores, the numbers show that the experiment was a resounding success. The average ACT score went from a 16 in 2009 to 21.5 in 2015 with 100 percent participation. EOC scores moved from 2009 all tested areas below state average to 2015 all tested areas exceeding the state average. Finally, AYP scores went from in 2009 the district being on the verge of being put on probation to, 2015 scoring in the top 10 schools in St. Louis, with greatest increase coming from free and reduced lunch students. The high school has won numerous awards to include: National Breakthrough High School 2014, US News Top High School Bronze winner 2015, National Urban School of Excellence 2015, and in 2016 and it was ranked the 33 best high school in Missouri.

Because I was a part of this success story, I am confident in our results that an integrated

curriculum is a successful model for 21st Century Skill development.

Our experiences and passion for the topic qualified us to pursue this research. The

classroom experience and diversity of pedagogical knowledge we possess provided a

level of insight for analysis of the literature and data. Author 2 had the experience in a

school-wide program, Kim implemented changes to the curriculum in a single classroom;

however, both of us have seen the positive impact of practices associated with the

integrated curriculum. The combination of these experiences gave a unique perspective to

researching the interrelationship between the integrated curriculum and the development

of 21st Century Skills.

Problem

Our individual experiences and review of the literature have indicated that

integrated curricular approaches are beneficial to student learning (Baker et al., 2015;

Beane, 1997; Bishop et al., 2009; Draghicescu et al., 2013; Fraser, 2000; Petroelje et al.,

2014; Vars et al., 2000). However, a school-wide integrated curriculum at the high school

level appears to be difficult to consistently implement. As schools prioritize the learning

of 21st Century Skills, an effective curricular model ought to be practiced. The term "21st

Century Skills" has become ubiquitous in education. A quick search of the term provides

over 1.4 million books and articles available in Google Scholar and a growing number of

schools incorporate the term into their mission statements and curricular guides. There

are numerous resources online for teachers to access related to 21st Century Skills

instruction. Based upon our personal experience and professional networking, we believe

that many teachers take advantage of these resources and adapt their instruction

accordingly. However, we argue that a change in curriculum is necessary to effectively

guide teachers, along with their students, on a planned and assessed path towards full

development of these desirable skills.

Purpose Statement

The purpose was to identify the interrelationship between the integrated

curriculum and the development of 21st Century Skills. Based on our review of the

literature, we have established a conceptual framework that supports the integrated

curriculum as an ideal method for the teaching and learning of 21st Century Skills.

Through mixed-methods research we gathered data from surveys and interviews with

high school educators that teach at schools that proclaim a curricular emphasis on both

21st Century Skills and integrated curriculum. The analysis of this data provided insight

and support of our argument that an integrated curriculum is an ideal method for the

teaching and learning of 21st Century Skills. Our research also provides insight into the

barriers to the implementation of an integrated curriculum along with potential solutions

for overcoming them; additionally, best practices for the teaching and learning of 21st

Century Skills through the integrated curriculum are presented.

Conceptual Framework

As we set out to determine if integrated curriculum is in fact an ideal method for

the teaching and learning of 21st Century Skills, we first explored literature to identify

which skills are considered important to the 21st century learner. In their study of 21st

Century Skills frameworks, Voogt and Pareja Roblin (2010), identified eight skills that

represent general themes for the most mentioned skills found among five popular

frameworks: Partnership for 21st Century Skills, EnGauge, Assessment and Teaching of

21st Century Skills, National Educational Technology Standards, and Technological

Literacy Framework for the 2012 National Assessment of Educational Progress.

Additionally, these authors considered the recommendations of the European Union, the

Organization for Economic Cooperation and Development, and the United Nations

Educational, Scientific, and Cultural Organization. Through our own research and review

of available 21st century frameworks, we have accepted the general themes established by

Voogt and Pareja Roblin (2010), which include these eight common skills: collaboration,

creativity, critical thinking, problem solving, communication, digital literacy, social and

cultural skills, and self-regulation (Appendix A). The authors outlined sub-skills and

desirable practices for each of the eight skills, we summarized these as:

- Collaboration: Working with heterogeneous groups to effectively reach a group
  goal.

- Creativity: An inquisitive, unique, and resilient approach to new opportunities.

- Critical thinking: Questioning, reflecting, and formulating ideas.

- Problem solving: Identifying problems and applying a variety of strategies to
  solve them.

- Communication: Using appropriate strategies to communicate with a variety of
  audiences for an intended purpose.

- Digital literacy: Employing basic skills and computational thinking to effectively
  search, select, process, use and present information.

- Social and cultural skills: Empathetic interactions and self-awareness to facilitate
  learning, working, living with a diverse population.

- Self-regulation: Awareness of responsible, productive behaviors and consequences.

While several authors argue that these skills are not in fact new, they go on to describe that their application and the nature of the content that is learned through their acquisition may be quite different than in previous generations (Dede, 2009; Rotherham & Willingham, 2010; Kereluik, Mishra, Fahnoe & Terry, 2013; Fisser & Thijs, 2015). For this reason, the integrated curriculum should be considered to support the acquisition of these skills by the 21st century learner.

Our research has gleaned three key features of the integrated curriculum: consideration of the real world, authentic connections among content areas, and negotiation of content with students. Our discovery of these is supported by Gavelek, Raphael, Biondo, and Wang (1999) who state that integrated methods "address three needs in education: authenticity, meaningfulness, and efficiency" (p. 1). We find that what these authors describe as authenticity aligns with our identified feature of consideration of the real world; meaningfulness is addressed through our identification of negotiation of content with students; and efficiency may be achieved by making authentic connections among content areas. Considering these ideas, we developed a conceptual framework to serve as the foundation for our argument that integrated curriculum is ideal for the implementation of 21st Century Skills education. Figure 1 provides a visual representation of the conceptual framework for our research.

In this nested representation of our conceptual framework, we present that

consideration of the real world is the presiding feature associated with the integrated

Consideration of the real world

Authentic connections among content areas

Negotiation of content with students

21st Century Skills

Creativity
Critical thinking
Problem-solving
Communication
Collaboration
Digital literacy
Social and cultural skills
Self-regulation

Figure 1. Conceptual framework

curriculum, thus encapsulating the other features along with the 21st Century Skills.

Frequent reference to preparing students for the real world and providing authentic

learning experiences is made in the 21st Century Skills literature (Darling-Hammond,

2006; Dede, 2009; Trilling & Fadel, 2009; Erstad, Eickelmann & Eichhorn, 2015). We

also view this consideration to be the driving force of connections among content areas.

Students are likely to encounter thought-provoking challenges and issues in the real

world that will require the knowledge and skills from more than a single content area; as

well as the purveyor of negotiation with students in that their personal real-world

experience will dictate their contributions. We also argue that student contributions will

be shaped by their prior knowledge developed through the connections made among

content areas as presented by the integrated curriculum; thus, establishing the position of

these two key features in the nested representation. Furthermore, the 21st Century Skills

literature appears to provide a foothold for integrated curriculum through the features of

authentic connections and negotiation with students. The feature of authentic connections

among content areas is communicated through the description of the transfer of

knowledge and skills (Landow, 2006; Dede, 2009; Kirschner & van Merriënboer, 2013;

Erstad, Eickelmann, & Eichhorn, 2015); while other authors like Rotherham &

Willingham. (2010) suggest that making deliberate and meaningful connections among

content areas is necessary because students do not necessarily make these connections or

transfer for themselves. The third feature of the integrated curriculum, negotiation of

content with students, also envelops these 21st Century Skills as student-centered and

student-responsive ideologies appear to be consistently represented in the 21st Century

Skills literature (Golsby-Smith, 2013; Erstad et al., 2015; Fisser et al., 2015).

Research Questions

Our research focused on the integrated curriculum as a best method to deliver 21st

Century Skills in a high school setting. We investigated the frequency of practices

associated with the integrated curriculum and attitudes associated with individual 21st

Century Skills through the lens of our primary research question: *What is the*

interrelationship between integrated curriculum and the teaching of 21st Century Skills?
We also planned to explore how attitudes regarding certain 21st Century Skills impacted curricular planning; as well as the barriers to the adoption of an integrated curriculum. Our secondary question included: *What are barriers to the adoption of an integrated curriculum at the secondary level?*

Significance of the Study

The billions of dollars spent on redesigning school and classroom environments has done little to change the practices therein (Pearlman, 2010.) Traditional practices including direct instruction of widely accepted, distinct disciplines are commonplace in the United States (Cuban, 2014; Pearlman, 2010.) The skills needed in the 21st century workplace will demand that students are able to interconnect the traditionally isolated disciplines in order to solve the complex problems of a fast-paced, technology-driven world (Mathison & Freeman, 1998). Integrated curriculum has its supporters and detractors; however, it provides an avenue to meet this demand through the three key features that we have identified and described in our conceptual framework. The literature identifying best practices for the teaching and learning of 21st Century Skills typically highlights one or two of the key features that we have included in our conceptual framework; however, consideration and intentional design of curricula including each of these features, we argue, is ideal for students to develop these skills.

The obstacles to the widespread implementation of an integrated curriculum can, in part, be described by Gordon Vars (1991) who states that "despite solid research support, the popularity of [integrated curriculum] waxes and wanes from year to year" (Vars, 1991. p.2). It is this pattern, along with arbitrary and conflicting definitions of

associated terms that may lead some to view the integrated curriculum as a passing fad. Our synthesis of the literature simplified the definition of the integrated curriculum to make it a more practical application for the instruction of 21st Century Skills, thus easing some frustration that may come with identifying methods associated with the term. Furthermore, our research and analysis yielded results which provide insight into the interrelationship between practices and attitudes that will help administrators and curriculum planners successfully implement a sustainable integrated curriculum in their schools.

Additionally, with this research we add to the body of literature supporting the integrated curriculum at the secondary level. Despite evidence that integrated curricula have demonstrated success at the preschool, elementary, middle school and even collegiate levels, high schools are noticeably underrepresented in the literature that we have reviewed. As schools across the country appear to be more inclined to adopt 21st Century Skills as a foundation of their stated mission and instructional practices, a reliable method of curriculum development is necessary if we hope to implement the teaching and learning of these skills to truly meet our objective of preparing students for the future. Research specific to the impact of 21st Century Skills education appears to be lacking (Erstad et al., 2015). The project at hand does not measure impact, however, opens the door to future research through our identification of current practices and teacher attitudes. The impact of 21st Century Skills education cannot be validly and reliably measured until there is a curricular model to ensure that these skills are being authentically developed. We view our research to justify the adoption of an integrated curriculum to fulfill this need.

Delimitations and Limitations

There are three identified delimitations for this study. First, the period of time for collecting survey data, October 2016 through December 2016; and the period of time for conducting interviews, December 2016. This sequence of data collection was not a feature of the mixed methods design of our study; however, logistically it was a necessary component of our data collection. The boundaries set by the time frame allowed us to meet program deadlines. Second, the criteria for invited participants of the survey and interviews were put in place to set boundaries on the data that we collected. Educators currently working in high schools that explicitly prioritize 21st Century Skills development as well as at least one of the three key features of the integrated curriculum: consideration of the real world, authentic connections among content areas, and negotiation of content with students. This delimitation provided some assurance that participants would be practitioners of our foci. Certainly, it was not guaranteed nor expected that participants were knowledgeable in the areas of integrated curriculum or 21st Century Skills; however, we view this delimitation to increase the likelihood that we collected data from participants that would help answer our research questions. Considering this, an additional inclusion criterion was added as we considered which survey responses to include. We determined that our analysis would only consider respondents who indicated that they were classroom teachers. Since these educators control the implementation of curriculum, we identified classroom teachers as those who are able to provide the most relevant insight to this study.

The third delimitation was the choosing of interview participants. We limited our interviewees to the school at which Author 2 works. It was determined that this school

had practiced all three key features of the integrated curriculum with varying levels of implementation and success over the years. Therefore, we viewed educators at this school to be most able to provide relevant data.

There are two limitations to our study. First, while our inclusion criteria for surveys and interviews provided necessary guidelines for those who could participate, the act of participating was beyond our control. We attempted to exert some control by providing a financial incentive. Participants could choose to be included in a drawing for a $50 Visa gift card. These drawings were limited to each school, therefore there were four separate drawings. Thus, the number of those invited may be viewed as a delimitation, the number of actual participants is a limitation of this study. The second limitation was the level of participation of survey respondents. A total of seventy-one educators participated. After eliminating those that did not meet inclusion criteria, sixty respondents remained and fifty-two answered all items on the survey. Therefore, not all respondents were included in each level of analysis providing another limiting factor that was outside of our control.

Summary

We have identified that the current paradigm of schooling is antiquated. The compartmentalization of content hinders collaboration and prevents authentic, real world connections to be made. With the growing body of literature providing valid arguments for the implementation of systems that focus on 21st Century Skills, we see now as an ideal time for the integrated curriculum. Through our conceptual framework, we have established how the integrated curriculum encompasses the teaching and learning of 21st Century Skills. This framework guided our data collection through surveys and interview

of educators working at schools promoting 21st Century Skills and features of the

integrated curriculum. Although educational programs focusing on 21st Century Skills do

seem to be sustained for the time being, the movement does run the risk of devolving into

a fad or being implemented with weak fidelity (Rotherham et al., 2010). We argue,

however, that an integrated curriculum will lessen this risk as we offer recommendations

based upon the literature and our research.

In the following chapter, we provide a review of the literature associated with

both 21st Century Skills and the integrated curriculum. Additionally, our literature review

will identify and extrapolate upon real and perceived barriers to the implementation of

the integrated curriculum. Of the barriers described, we will give special attention to

long-held beliefs and attitudes of educators, as much of our data analysis will focus on

teacher attitudes collected through surveys and interviews. Through this, we hope to

provide adequate support for the growing focus on 21st Century Skills in schools across

the country, as well as establish a sufficient need for the integrated curriculum as an ideal

guide for 21st Century Skills education.

Chapter 2.

Literature Review

History teaches us that the only reliable constant is change. Over the course of

humankind, we have marked different ages with technological innovations and their

impact on society. For example, during the Neolithic Revolution primitive people began

to settle down and farm. During the Bronze Age, humans began to master the art of

metallurgy. The dawn of the Iron Age brought about a revolution in farming and

population growth. Over the course of the last 200 years, humanity has seen a rapid and

unprecedented growth in technology. We quickly moved from an agrarian society to an

industrial one. Now we stand on the precipice of the information age, and the inertia of

the past 200 years shows no sign of waning. Education plays an important role that helps

advance these technological innovations. As the complexity of technology increases,

educators must explore innovative methods of curriculum and instruction in order to

serve the ever-changing demands of their constituency. Now, at the dawn of the

information society, we ask the questions: What skills do we need to survive? What are

the skills necessary to be successful in the 21st century? What are the best ways to teach

these new skills?

     The research on 21st Century Skills tells us that our ability to communicate,

collaborate, be creative, self-regulate, problem solve, innovate, and employ digital

literacy along with social and cultural skills are essential for success (Fisser et al., 2015).

The nature of 21st Century Skills asks students to become more interdependent with each

other, and more interactive with the real world. This level of interdependence and

interactivity is a shift away from the traditional paradigm of an individualistic,

disconnected approach to school. The days of Linear Curriculum Theory, with its

maximum control, structure and order, need to give way to a Holistic Curricular Theory

that allows for the integration and collaboration that is necessary for successful

attainment of 21st Century Skills (Glatthorn, Boschee, & Whitehead, 2009). In this

chapter, we establish a need for the teaching of 21st Century Skills through synthesis of

existing literature, highlighting new applications for a new century and the teaching of

the 21st century learner.

Additionally, we explore literature related to the integrated curriculum, which is a bit more tumultuous. We describe each of the three key features gleaned from the literature that serve as the basis for our conceptual framework, thus adding yet another definition of integrated curriculum to the body of research; but one that is inclusive of other definitions, and establishes key features that distinguish the integrated curriculum from other terms and practices with which it is oftentimes incorrectly transposed. Thoughtful consideration is given to these terms and practices, however, and a continuum of implementation is explored. Although integrated curriculum and the various approaches that fall beneath the umbrella of the term have had varying bouts of popularity since the early twentieth century (Drake & Burns, 2004), nearly one hundred years later there still appears to be a lack of consensus in defining the practice and its levels of implementation (Applebee et al., 2007; Beane, 1991; Fraser, 2000). Therefore, we also explore various barriers to the use of an integrated curriculum, most notably: school economics and testing culture, ambiguity of terminology, and educator perceptions and priorities.

21st Century Skills

Active participants in a knowledge-based society will need to develop 21st Century Skills in such a way that they are applicable to our increasingly globalized, technology-focused, and incessantly changing world (Fisser et al., 2015). A number of organizations from around the world have put forth recommendations concerning what these skills ought to be. Voogt and Roblin (2012) reviewed the literature and summarized their findings of 21st century competencies. A total of eight 21st century frameworks were reviewed. These eight organizations represented countries from all over the world

and were sponsored by various governments and major corporations, thus removing some level of bias that could be argued to support the priorities of just one nation or corporation. Fisser and Thijs (2015), working from the findings of the research by Voogt and Pareja Roblin (2010), considered the following eight as 21st Century Skills that reflect the various frameworks which were analyzed: Creativity, critical thinking, problem solving, communication, collaboration, digital literacy, social and cultural skills and self-regulation.

These eight skills are not innovative or revolutionary ideas in education, rather, these concepts have been a well-established part of many intended curricula and pedagogical theory for some time. However, high school graduates seem to be lacking these highly desired skills as they go on to postsecondary institutions and beyond. Therefore, the re-examination of these skills, along with the innovation that is expected from their application in a knowledge-based society, has become a frequent topic of discussion in educational literature. We have yet to find an argument against the point that students need to be able to take the issues of a rapidly changing world and look at them in a new and revolutionary way. Thus, in the following paragraphs we explore literature establishing a need for the development of 21st Century Skills in the learners of today and tomorrow.

New applications for a new century. As we provide some background and historical context to support the 21st Century Skills movement, we have pointed out that the 21st Century Skills are not in and of themselves new; however, their application in the 21st century is different than in generations past. Kereluik et al. (2013) point out that, "the forces of globalization and technological and cultural change" provide new challenges in

education (p. 227). While the skills outlined in the 21st century frameworks may have

been previously used, to some degree, to answer the question, "How can I rearrange what

already exists?" 21st century learners will instead be charged with answering the question,

"How can this be otherwise?" (Golsby-Smith, 2013). Summarizing these ideas, "it can be

concluded that students must learn to solve information-based problems and must learn

transferable search and evaluation strategies" (Kirschner et al., 2013, p. 177).

While some may argue, and we support, that 21st Century Skills have been valued

for ages, the digital literacy piece of the framework does appear to be more exclusive to

the 21st century. This comes as no surprise as technology in ever-evolving forms delivers

information and provides us with an endless array of "apps" that a decade ago may have

been difficult to imagine. In our review of the 21st Century Skills related literature,

"technology," was mentioned more times than any other term specifically associated with

21st Century Skills. With so much emphasis on this topic, it is important to point out that

while skills associated with technology and digital literacy are oftentimes assumed to be

inherent skills of 21st century learners, we cannot take their constant exposure for

granted. As it turns out, most secondary students do not possess the deep knowledge

suggested in the 21st Century Skills framework, and their skill base is typically limited to

superficial interactions with basic office programs, social media and web browsing

(Kirschner et al., 2013). According to Lee, Lim, and Grabowski (2010), learners are not

typically successful controlling their own learning in computer-based environments.

Uninformed leadership is not ideal for any situation, so why would we allow students to

essentially lead themselves when they are uninformed? This points to the need to

consider the information literacy skills that have been valued in the past in a new light

and for novel, digital-specific applications. According to Dede (2009), "21st Century

Skills are different than 20th century skills primarily due to the emergence of very

sophisticated information and communications technologies" (p. 1).

The new application of these skills, then, must be general enough to transfer to the

continuous updating of devices, and yet refined enough to sort through the endless stream

of information. This latter point appears to be of greatest concern to authors in the field of

21st Century Skills research. Huge amounts of data are made available in an instant and

must be efficiently examined and evaluated to keep up with the tempo of the availability

of new information (Dede, 2009; Kirschner et al., 2013). While scholars and researchers

of the 20th century may have revelled at this opportunity as opposed to rummaging

through numbers of books and articles to find just a few bits of information, the

accessibility of so much data is both a blessing and a curse. Describes Postman (1993),

"Information appears indiscriminately, directed at no one in particular, in enormous

volume and at high speeds, and disconnected from theory, meaning and purpose" (p. 70).

Thus, the argument is that 21st century education must change to keep up with the

developments brought on by technology and all areas that feel the ripple effect of our

increasingly digital-based understanding of the world.

Teaching 21st century learners. There appears to be some attitudes surrounding

21st century learning, especially considering the increasing utility of technology as

described in the previous section, that students may be self-sufficient in their learning if

teachers would just get out of the way (Greenlaw, 2015). However, as we summarized

above, students do not necessarily have the skills to successfully navigate and synthesize

all of the information available, which means that, "The importance of powerful teaching

is increasingly important in contemporary society" (Darling-Hammond, 2006, p. 1).

Teachers must be prepared to develop skills that will provide students with, "more

authentic experiences by collaboration between schools, museums, companies, and other

organisations" (Erstad et al., 2015, p. 649). It is important, too, however, that teachers are

not quick to assume that time-tested best practices no longer have a place in the

classroom simply because we are preparing students to develop 21st Century Skills. This

way of thinking may lead to abandonment, and the labeling of programs such as 21st

Century Skills as a fad.

On the contrary, teachers will need to possess as many strategies as possible, from

effective direct instruction to the design of project-based learning tasks, to make 21st

Century Skills attainable for all (Darling-Hammond, 2006). Therefore, while instructional

methods considered to be time-tested best practices may continue to be refined to meet

the needs of 21st century learners, our focus here is instead on a curricular design that

favors integration and provides a roadmap for considering the real world, making

authentic connections among content areas, and negotiating content with students. The

traditional, compartmentalized curriculum does not adequately provide teachers with the

opportunity to create learning environments conducive to the development of 21st

Century Skills. Maintaining a strict separation of disciplines denies students the

opportunity to experience content and concepts in a meaningful way, thus limiting the

interconnectedness highlighted in the 21st Century Skills. Furthermore, with the

continuous advancement of technology, we live in an increasingly "interconnected and

interdependent world"; therefore, knowledge and skills at school must also be presented

to students in an interconnected and interdependent way (Drake, 1998). Integrated

curriculum supports this because its foci of consideration of the real world, authentic

connections among content areas, and negotiation with students provide a pragmatic

design that allows students to do the type of thinking, and gaining a sense of ownership

that will be required to solve future problems.

Integrated Curriculum

Provided the array of related approaches, it may be best to consider integrated

curriculum as a continuum of practices that fall somewhere between the traditional

distinction of individual content areas and the definition of integrated curriculum from

the National Council for Teachers of English (1935), "The unification of all subjects and

experiences" (as cited by Drake & Burns, 2004, p. 8). The consideration of a continuum,

or different phases of curriculum integration, has been described by various authors

(Adler & Flihan, 1997; Applebee et al., 2007; Drake & Burns, 2004; Fogarty, 1991; Vars,

1991) in which the disciplines move from being distinct and separate, to being combined

with boundaries preserved, to being blended until disciplinary distinctions are no longer

evident. (Adler & Flihan, 1997). Through all of this variety, however, there seem to be

three common features (employed with varying levels) that we have gleaned from our

research of the integrated curriculum: Consideration of the 'real world,' authentic

connections among content areas, and negotiation of content with students.

While some authors describe relating curriculum integration to the 'real world' in

terms of serious examination of social issues (Beane, 1991) or actively preparing to

participate in a democracy (Vars & Beane, 2000), others consider employing the practice

to simply replicate the 'real world' as it exists: interconnected (Humphreys et al., 1981;

Shoemaker, 1989). Drake (1998) supports this, and describes, "The world we are living

in is changing, and education must change with it. If we live in an interconnected and interdependent world, it only makes sense that knowledge be presented as interconnected and interdependent" (p. 24). Which leads to another frequently observed characteristic of authentic connections among content areas.

In the literature describing integrated curriculum, the most distinguishable thread woven throughout is finding opportunities to relate, correlate or combine the content of one discipline to that of another. In fact, in many cases this is the key identified for curricular approaches that fall along the integrated curriculum continuum. We have identified three overarching categories that are commonly referenced in description of making authentic connections among content areas: multidisciplinary, interdisciplinary, and transdisciplinary. The first, multidisciplinary, is generally where the thematic connections are made among traditionally separated content areas (Drake & Burns, 2004). Through this approach, a theme is considered from the perspective of multiple disciplines, thereby providing more clarity and the opportunity for deeper understanding by the student (Draghicescu et al., 2013). Vars (1991) identifies such thematic organization as "correlation" (p. 14) which, "may be as slight as casual attention to related materials in other subject areas" (NCTE, 1935 as cited by Drake & Burns, 2004, p. 8). Fraser (2000), however, argues that the planning of thematic units among disciplines and true curriculum integration are "distinctly different" (p.20). Thus, while multidisciplinary planning frequently finds its place in the literature about the integrated curriculum, these strategies may fall on the end of the continuum closest to traditional discipline arrangements, as the literature describing multidisciplinary planning does not include negotiation nor does it explicitly describe the consideration of the real world.

However, it may serve as a starting point for schools considering an integrated curriculum.

The distinction between multidisciplinary and interdisciplinary methods appears to be found in the depth of connections made among content areas, and the deliberate inclusion of 'real world' issues. As such issues are intrinsically complex, the interdisciplinary approach recognizes the need to include the various knowledge and skills that are, "offered by several disciplines, among which clear connected relations are established" (Draghicescu et al., 2013). While multidisciplinary curriculum planning frequently maintains the distinction among disciplines, interdisciplinary methods may begin to blur the lines that traditionally separate one content area from another (Drake & Burns, 2004). So much so, in fact, that an interdisciplinary emphasis may lead to the development of a new course through curriculum reorganization (Vars, 1991). The third approach, the transdisciplinary curriculum, appears to be the most closely linked with practices on the end of the integrated curriculum furthest away from traditional discipline-based division. Defined by Drake and Burns (2004) as, "Teachers organize curriculum around student questions and concerns" (p. 13). Here the student negotiation aspect, described below, is of significant importance.

The transdisciplinary curriculum, termed "unstructured core" by Beane (1991), is one in which students and teachers work together to develop units that cut across various disciplines. Fraser (2000) cautions, however, that approaching the curriculum in this way is not to be purely student-driven, and that the knowledge and skills of the teacher are not to be undermined. Employing a transdisciplinary approach does require flexibility, and teachers may be weary of this level of curriculum integration because it involves a

process that cannot be carefully planned ahead of time (Fraser & Charteris, 1998), and may challenge their traditional way of operating in the classroom, which may be daunting and exhausting (Drake, 1998). Regardless of the chosen approach, it is important to note that making these connections must go beyond superficial overlaps (Beane, 1991; Fraser, 2000) to instead make authentic and meaningful connections for students (Shoemaker, 1989). In describing this component, frequent reference is made to breaking free from the traditional segmented educational structure (Beane, 1991; Pring, 2006; Shoemaker, 1989). Thus, identifying one of the obstacles to implementation of the integrated curriculum-- the traditional view of what school ought to look like-- that will be explored later.

While common in theory, the third characteristic of the integrated curriculum may be overlooked in practice. Negotiation of content begins with identification of the prior knowledge of students, along with their skills and interests (Mathews & Cleary, 1993; Whyte & Strang, 1998). While this may be a common best practice for many, the negotiation process takes it a step further in that students help dictate the direction of the curriculum based on these skills, interests and bases of knowledge (Beane, 1991; Fraser, 2000). This piece allows for students to craft for themselves connections between the 'real world' and the various content areas in response to their own developmental needs and interests.

Previous and many current curricula do not prepare students to be active decision makers in their learning. What ownership do students feel with the traditional curriculum? Certainly, talented teachers have made efforts to create opportunities for students to feel a sense of ownership through differentiation and other methods; however,

how much opportunity is lost due to the limitations of the traditional curricular design?

"Instead of speculating on and assuming what is needed and fitting for students, give

young people a powerful voice in curriculum planning" (Beane, 1991, p. 12). This

"powerful voice," as a key feature of the integrated curriculum, establishes the student

role of an active participant. The sense of ownership afforded by this negotiation

increases student commitment to their own learning (Cook, 1992; Fraser, 2000). As

discussed previously, 21st Century Skills in and of themselves are fundamentally

appropriate for anytime and place; however, students change, and the curriculum ought to

change with them. We cannot assume that because these skills have always been ideal

that they have always been developed; nor will they be if a concerted effort is not made

to appropriately design a curriculum to deliver these skills to a diverse generation of

students that refuse to be simple receptacles of information (Veugelers, 2004; Golsby-

Smith, 2013; Erstad et al., 2015). Integrated curriculum explicitly offers the incorporation

of student voice necessary for the full development of 21st Century Skills.

Barriers to Implementation

As we reflected on our personal experiences and researched the relevant literature

related to the integrated curriculum and its potential benefits, we were puzzled by the

lack of implementation at the secondary level. Thus, we explore here some of the

possible barriers that may be preventing the integrated curriculum to be more widely

accepted and sustained in high schools. The obstacles to integrated curriculum, seem to

correspond to the obstacles of successful education in general. We have identified three

common barriers as well as the possible role they have in preventing a higher acceptance

rate of the integrated curriculum: economics and the testing culture; ambiguity in

terminology; and teacher attitudes, including the role of the "apprenticeship of observation" (Berry, 2013, p. 9) and maintaining traditional curricular organization.

Economics and the testing culture. The economics of education is a complex blend of politics, bureaucracy and public perception, which has an important impact on school curriculum and pedagogy. This idea is substantiated in the 2012 Phi Delta Kappa-Gallup Poll: *What Americans said about the Public Schools*, in which 39 % of survey participants indicated that the biggest problem facing public schools was funding. The poll also revealed that school funding has consistently been a main concern for over 10 years, outweighing things such as drugs, safety and school discipline (Bushaw, 2012).

In 2001, the adoption of No Child Left Behind (NCLB) drastically changed the economics of education. The intent of Title 1 of the NCLB legislation is to create a more equitable system of education for all students regardless of the socioeconomic status of the school district. Equity of education was to be measured through careful assessment of attainment of standards by students through a series of state sponsored standardized assessments (NCLB, 2002). As a result of NCLB, a culture of high stakes testing has permeated American schools (Nanna & Moses, 2007). The expansion of high stakes testing has been a financial windfall for education-based businesses, specifically, organizations that specialize in creating and delivering assessments. An excellent example of this is the commentary of Rupert Murdoch, who referred to the American public-school system as a $500 billion dollar a year untapped market (Glass & Welner, 2011). In addition to Murdoch's comments, the four largest testing companies of Harcourt Educational Measurement, CTB McGraw-Hill, Riverside Publishing, which is a

subsidiary of Houghton Mifflin company, and NCS Pearson saw sales increase from

$700 million in 2001 to $2 billion in 2014 (Furlong, 2001).

With over $600 billion being spent annually on public education, the question is

not whether there is enough funding, but is the money being spent effectively? It is

widely accepted that the current emphasis on high stakes testing is not conducive for

measuring 21st Century Skills (Darling-Hammond & Adamson, 2010). However, the

economic inertia created by the culture of testing potentially could hinder any systemic

curricular change. The big four testing companies have a vested interest in maintaining

the status quo. For example, all four companies spent more than $20 million between

2009 and 2014 on lobbyists at the state and local level alone (Strauss, 2015). The expense

of integrated curriculum is considered one of the major barriers to its implementation

(Beane, 1991). The resource organization of integrated curriculum is much different than

a more traditional curriculum. This non-traditional approach may be perceived as a

challenge to the financial interests of those who profit from the rigidity of prescribed

scope and sequencing curriculum and reliance on textbooks (Beane, 1997).

Ambiguity and the effect of jargon. In the early stages of our literature review

and research, our original topic was focused on interdisciplinary curriculum. After

reading an array of articles, it was clear to us that there is little consensus about the

definition of the term, best practices associated with it, and little empirical evidence

supporting its success rate with students. We found descriptions of interdisciplinary

instruction ranging from the inclusion of technology across the curriculum (Drake &

Burns, 2004) to thematic correlation of broad concepts (Vars, 1991). In our frustration,

we began to explore beyond the term "interdisciplinary" itself, only to find an abundance

of articles discussing a variety of models, methods and features that we would later

discover all fall under the umbrella of the integrated curriculum, which of course has

come with its own challenges in defining. At various points in our review of the

literature, we considered changing our topic all together--which led to the ultimate

inclusion of our incorporation of the focus on 21st Century Skills--out of disillusionment

that came from the inconsistent use of terminology and utter confusion regarding best

methods. While we have since identified all of this as an opportunity to add a well-

researched and practical guide for integrated curriculum and 21st Century Skills to the

current body of literature, we can also understand why such ambiguity may lead to the

abandonment, or altogether avoidance, of practices associated with these terms.

In order to illustrate the ambiguity of the integrated curriculum and associated

terms, one need look no further than the thoughts of Beane (1991), who states, "what

passes for interdisciplinary is really multidisciplinary and is certainly not integrative" (p.

10). While the terms in and of themselves may not be inherently confusing, the context

provides little to aid the reader in deciphering how one is to differentiate one term from

the next. This quote by Beane (1991) is certainly not the only statement on the topic that

may leave readers scratching their heads; however, in addition to illustrating the

ambiguity of terms associated with the integrated curriculum, it also leads us to consider

the role of educational jargon, such as this, as potentially "communicating ideas that we

have never intended" (Boostrom, 1997). With such variety in definition, it may be very

likely that one is describing multidisciplinary curriculum using interdisciplinary

terminology, further adding to the confusion among practitioners. Thus, our adoption of

the broader term, "integrated curriculum." While still varying in definition and

identification of invariably specific methods, the three key features that we have identified are consistently represented throughout the literature.

Teacher perceptions, attitudes and the maintenance of tradition. The implications associated with teacher attitudes appear to be rooted in various facets of human psychology and educational theory. Teacher resistance will be explored here as a barrier to the integrated curriculum; however, this in no way is intended to suggest that teachers are the problem. Instead, we believe that it is the traditional organization of schools that is limiting teachers, and creating the common reaction of resistance to employ "new" curricular methods, such as the integrated curriculum.

Teacher resistance to change may be a significant obstacle to the implementation of new methods. Williamson & Blackburn (2010) describe two primary and interrelated reasons for such resistance. First, teachers may not see the value, and second, they are uncertain of the success. Teacher attitudes are among the most important factors to the successful implementation of any new strategy (Calabrese, 2002; Clawson, 1999; Duke, 2004; Greenberg & Baron, 2000; Robbins, 2000; Zimmerman, 2006). Often, as noted by Williamson & Blackburn (2010), teachers do not see the value if they do not understand why the change is happening. This is oftentimes due, in part, to the top-down changes that have taken place and are viewed as mandatory add-ons that rarely appear to take into consideration the complex dynamics of an already challenging job (Cuban, 2011). Additional disillusionment and resistance regarding the lack of value placed on changes may be attributed to the failure of previous reforms. Poor implementation contributing to high turnover rates of policies and adoption of school-mandated methods has left many

teachers skeptical, and with good reason (Schmoker, 1999; Greenberg & Baron, 2000; Cuban, 2011).

The inability of a school to commit to the sustainability of a new program and its desire to indulge in a pattern of change for change's sake, or to become enamored with the latest and greatest trends in education can also lead to teacher skepticism and lack of enthusiasm (Hargreaves, 2006). The lack of success of previous reforms not only limits the amount of value that may be placed on those that follow, but also leads to the second point of Williamson & Blackburn (2010) in that teachers are uncertain of the likelihood of success. This uncertainty, or lack of buy-in, may lead to only partial implementation, which will limit the likelihood of success for any project (Cuban, 2011). Furthermore, "the key element in significant change in teachers' attitudes and beliefs is clear evidence of improvement in the learning outcomes of their students" (Guskey, 2000, p. 384). Another aspect of doubting the potential success of a newly adopted practice, such as integrated curriculum, may lead to, concerns about that which they may be teaching and questioning their knowledge, skill and potential for success in the classroom (Clawson, 1999; Williamson & Blackburn, 2010).

This leads to the point that self-identification is often at the root of resistance when asking someone to change. To ask one to change behaviors that have been perceived as reasonably successful, or simply practiced for a considerable amount of time, can be equated to asking one to change their ingrained idea of himself (Heifetz, 2002). In the initial phase of implementation of a new concept, the individual may be left in a state of denial similar to the first stage of the grieving process after a loss (Calabrese, 2002; Clawson, 1999). Considering this along with the previous point of questioning

potential success, we are reminded of the importance of teacher self-efficacy in relation

to successful student outcomes. According to Bandura (1993), "efficacy beliefs influence

how people feel, think, motivate themselves, and behave" (p. 118). This efficacy, or

belief in one's level of control and ability to affect their environment (American

Psychological Association, 2015), then directly impacts one's performance. Continues

Bandura (1993), "Hence, a person with the same knowledge and skills may perform

poorly, adequately, or extraordinarily depending on fluctuations in self-efficacy thinking"

(p. 119). This directly affects implementation of new strategies, such as the integrated

curriculum, because the uncertainty previously discussed coupled with venturing out of

one's pedagogical comfort zone leads to rejection. Understandably so, as teachers with

higher levels of self-efficacy tend to be more successful in the classroom (Gibson &

Dembo, 1984; Bandura, 1993; Rosenholtz, 1989), it is often the case that maintaining the

status quo is perceived as safer and less difficult than accepting change (Greenberg et al.,

2000).

  The psychology of change and self-efficacy are clearly important factors to

consider as we explore the barriers associated with teacher attitudes. Of similar

importance is the maintenance of traditional structures regarding curricular design and

the organization of schools. Teaching how one was taught, or the "apprenticeship of

observation" (Berry, 2013), has taken place throughout the history of education and is

difficult to move beyond. As previously mentioned, best practices that consistently yield

positive student results are not to be admonished. Each of us more than likely models an

activity, assessment, or some other strategy learned through observing a favorite teacher.

However, it appears that teaching as one was taught has maintained such a prominent

place in education that new, beneficial practices-- such as the integrated curriculum,

especially in the planning and facilitation of 21st Century Skills education-- may be

overlooked because they do not represent the perceived ideal of what school ought to

look like. Furthermore, teachers that belong to schools that have long established

structures and decision-making hierarchies could perceive change as a threat to

distribution of power within the organization. Such change may threaten the long-

established distribution of limited resources, and some teachers may resist new concepts

because of the potential loss of these resources (Robbins, 2000). Along with these

challenges, the subject-centered curricula of the traditional high school and the obstacles

these present to planning for curriculum integration are apparent in most secondary

settings across the country (Beane, 1991; Bullock et al., 2002).

Conclusion

In our literature review we described the features of 21st Century Skills and

attributes of the 21st century learner. Our research identified that these skills are not

necessarily new, but that their novel applications, especially in the area of technology,

require educators to consider a new paradigm of education. We also identified and

described key features of the integrated curriculum, establishing its place as an ideal

method to best plan and facilitate the learning of 21st Century Skills. Our final section

explored some barriers to the integrated curriculum (and arguably the promotion of 21st

Century Skills, as well) to provide background knowledge as we explore the results of

our surveys and interviews, which we anticipate will not describe any single setting with

one hundred percent of faculty practicing features of the integrated curriculum with the

same depth and frequency. With this research base, we are confident that our conceptual

framework will provide a reliable guide for our data collection, analysis, conclusions and implications described in the following chapters.

Chapter 3.

Methodology

In their article exploring educational "urban legends," Krischner and van Merrienboer (2013) articulate the need for research over speculation in education:

> We hear many claims as to what is wrong with education, what is needed to correct those wrongs, and why this is the case. Many of the claims, regrettably, are based on belief rather than science and have become tenacious urban legends used by instructional designers, curriculum reformers, politicians, school administrators, and advisory groups all vying for position to show how innovative and up to date they can be (p. 169).

In the attempt to avoid our research and conclusions being categorized in the same group as the educational "claims" described above, we chose a methodology that is reflective of widely-accepted research practices in the social sciences and educational research: mixed-methods relying on our well-informed interpretations of collected data. Thus, our research does not qualify as empirical, but rather theoretical. The description of this methodology in the following chapter has six sections: Research design, population and participants, instrumentation, data collection procedures, interview protocol, data analysis, and limitations of our research.

Research Design

In order to fully explore and answer our research questions, we chose mixed-methods for our data collection and analysis. According to Roberts (2010), "Qualitative

and quantitative approaches in a single study complement each other by providing results with greater breadth and depth" (p. 145). Our primary research question requires conditions and considerations for breadth and depth, as interrelationships are multifaceted. The narrow scope that would have inevitably been the result of using a single research method likely would not have sufficiently gathered practices and perceptions of teachers. Inasmuch, breadth and depth were considered in terms of the multiple viewpoints used throughout our data analyses described later in this chapter; and afforded to this research through the use of quantitative methods (survey) and qualitative methods (interview) of data collection.

According to Niglas (2007), "The 'paradigm shift' from positivist-quantitative to interpretivist-qualitative ways of doing research has been advocated by many writers and methodologists as the most desired goal, especially in the field of educational research" (p. 2). As teaching and learning are personal experiences, unique to each individual, the philosophical orientation of phenomenology (Roberts, 2010) seems to be an appropriate foundation for gathering data that will be used in our analysis and conclusions. Reflecting on the diagram "Relationship between philosophy and methodology in social science and educational research" (Niglas, 2007), we observed that this sort of philosophy would generally favor qualitative methods. However, our interest in interrelationship, collection of survey data, and research questions consistent with critical theory lead us to select a "combined design" that seeks to find interrelationships through strategies of phenomenology, critical theory, pragmatism and statistical analysis (Niglas, 2007, p. 201). In sum, a full exploration into the interrelationship between the integrated curriculum and the teaching of 21st Century Skills require more than our speculation.

Our conclusions of the qualitative data analysis are triangulated for trustworthiness by including quantitative analysis methods in drawing conclusions from our research. To reiterate the ideas of Krischner et al. (2013), educators "should reject educational approaches that lack sufficient scientific support and methodically sound empirical evidence" (p. 178). We will continue to argue in favor of the integrated curriculum to support the design and facilitation of learning experiences that develop 21st Century Skills; accordingly, to provide a trustworthy addition to the existing body of literature, we find that the mixed-methods approach will establish support that may give educators confidence in adopting this educational approach.

Population and Participants

Another criterion that we added for distributing the survey was the perceived likelihood that teachers employ at least one of the three key features of the integrated curriculum. Our review of the curriculum guides for School A and School B demonstrated an intent to incorporate some level of interdisciplinary study which is indicative of the feature authentic connections among content areas. Author 2's personal experience at his school, School C, provided reliable information about curricular practice that lead to its inclusion. School D participates in the Advanced Placement (AP) Capstone program which lead to this school meeting the criterion. The AP Capstone program requires students to use independent research and collaboration to, "complement and enhance the discipline-specific study in other AP course" (The College Board, 2017).

Table 1

Inclusion Criteria for Distribution of Survey to Schools

	Original criteria for inclusion in the survey				Added inclusion criterion		
	Secondary/ High School	St. Louis Metro Area	CWRA+ given to students	CWRA+ data shared for analysis	Explicitly favor 21st Century Skills	Evidence of Integrated Curriculum	Total number of Participants
School A	x	x	x	x	x	x	15
School B	x	x	x		x	x	18
School C	x	x			x	x	34
School D	x				x	x	4
					Total number of survey participants:		**71**

While our survey data collection is more limited than we had originally anticipated it provided sufficient information contributing much insight as we worked to answer our research questions. Table 1 shows the original and expanded inclusion criteria for the distribution of surveys along with the total number participants from each school. In addition to survey participation, one of the four schools also provided participants for interviews. While each survey participant from all schools had the opportunity to volunteer to participate in an interview, agreement to participate, time constraints of the study, and logistics limited our pool of interviewees to School C.

Instrumentation

The survey (Appendix B) administered to teacher participants, using Qualtrics software provided by the University of Missouri- St. Louis, was designed using the conceptual framework developed from our synthesis of the literature reviewed for this study. A pilot survey was conducted with educators at the school of Author 1 in April

2016. Twelve classroom teachers completed each of the five sections of the survey and their subsequent feedback impacted the design and organization of the survey that was ultimately completed by participants for this study. Feedback from these pilot survey participants included suggestions to allow free-response for the item collecting information about the content taught, as well as frequent reminders of the Likert scale indicators throughout the section of the survey measuring value of 21st Century Skills. We accepted both of these suggestions. The first suggestion seemed appropriate because many educators have varying titles and content areas that the original check-box option did not include. The second suggestion also seemed appropriate so that participants were aware of how they were responding to each item instead of frequently scrolling back to the top to identify what each point on the Likert scale represented. Further validation of survey items did not take place as our goal for this study was not to provide parametric data.

There were five sections of the survey, three of which collected data used in our analysis: professional demographics, integrated curricular practices, and value of 21st Century Skills. The other two sections of the survey included informed consent and invitation for participants to be included in follow-up interviews as well as in a drawing for a small financial incentive ($50 Visa gift card) for their participation in the survey. While the design of items described in the following paragraphs purposefully excluded the use of the terms, "integrated curriculum," and, "21st Century Skills," these terms were used in the description of our study outlined in the informed consent section. The complete survey is included in Appendix B.

The first of the three sections of the survey used in our analysis intended to collect basic professional demographics from each participant. It includes three questions: How long have you been teaching (years)? How long have you been at your current school (years)? What is your current title including content area and grade level? Participants answered the first two questions using the following options: 1-4 years, 5-9 years, 10-14 years, 15+ years. The final question in this first part of the survey was free-response. The inclusion of this professional demographic information assisted in disaggregating the data collected from responses on the items included in the other sections of the survey which are described in the following paragraphs. While other questions to collect demographic information related to gender and education level were considered, the scope of our research questions did not warrant an analysis of these variables.

The second section of the survey measured the frequency of practices associated with the three key features of the integrated curriculum identified in our conceptual framework, as well as participant perceptions of student learning related to these key features. As the term "integrated curriculum" is challenging to define for the typical teacher and its interpretation by the participants may have affected responses, this term was purposefully excluded from this section of the survey. The perception of educational terminology, as discussed in chapter two, may lead to confusion or bias; therefore, items in this section were designed to collect data regarding frequency of practice of the three key features of the integrated curriculum, without explicitly identifying them as such. Sixteen closed-response items, one open-response item (used to elaborate on the immediately preceding selected response), and two items including check-boxes in which participants could select more than one answer were included in this section of the

survey. Table 2 illustrates how items from this section are distributed among the three key features of the integrated curriculum, as well as their designation of association with planning, assessment, or perceptions. The numbers in the table below indicates the order of the question within section two of the survey.

Table 2

Survey Section Two (Integrated Curricular Practices) Item Distribution Among Key Features

	Real World	Authentic Connections	Student Involvement
Planning	2.1, 2.2, 2.3	2.5, 2.18, 2.19	2.8, 2.10, 2.11, 2.12
Assessment	2.4	2.6	2.9
Perceptions	2.14, 2.15	2.7, 2.16, 2.17	2.13

The final section of the teacher survey was intended to gather individual opinions of the participants related to 21st Century Skills. As they began this section, teachers were prompted with, *As an educator that works with high school-aged students, we value your opinion regarding the importance of students developing the following skills. For each skill, please indicate how important you believe it to be.* Participants used a five-point, Likert-type scale on thirty-eight items to indicate their opinions regarding the level of importance of the 21st Century Skills outlined in Appendix A. As with the previous section of the survey regarding the integrated curriculum, participants were purposefully not prompted with the term "21st Century Skills" upon beginning this section to avoid the bias that may accompany the use of educational jargon. Responses to these items provided data regarding preferred skills which revealed interesting results and insights into the perceived value of 21st Century Skills. We also used this data to determine an

interrelationship among these skills and the level of implementation of an integrated

curriculum.

Development of the interview questions was not such a detailed-oriented process.

Instead, the guiding questions used (Appendix D) were based upon our review of the

literature and questions we jotted down during our development of Chapter Two. These

questions were intentionally developed before we began our analysis of the survey data.

We wanted to explore teacher perspectives associated with the integrated curriculum and

21st Century Skills, but did not want to develop questions that may unintentionally sway

interview participants to offer responses that would serve the purpose of supporting our

survey findings in an inauthentic way. This intentional design added an aspect of

trustworthiness to the findings of our study.

Data Collection Procedures

Initial contact to identify willing participants for the survey and the sharing of

CWRA+ data was made in May, 2-16. Four building principals at schools who met our

original inclusion criteria were contacted via email (Appendix C.) Per requirement of the

university, surveys could not be distributed until we received approval on our IRB; thus,

it was also communicated that these surveys would not be disbursed until the fall

semester of 2016. While each of the four principals indicated in their response email that

they would distribute the survey to teachers in the fall, only two in fact did. Teachers at

these schools, identified as 'School A' and 'School B,' completed surveys in October,

2016. As we described earlier in this chapter, School A also provided CWRA+ data for

the 2015-2016 school year. However, we determined that the results of this assessment

would not be considered in our analysis. We instead directed our focus to data that could be collected from a larger pool of schools.

Desiring a larger number of participants, we broadened our inclusion criteria, to include six additional schools that explicitly state in their school mission and/or curricular guides that the teaching and learning of 21st Century Skills are a priority, however they do not administer the CWRA+. We also added the criterion of evidence that at least one key feature of the integrated curriculum was being encouraged. From this second round, two additional schools agreed to participate, identified as 'School C' and 'School D.' Participants at these schools completed the survey in November, 2016 and December, 2016, respectively.

In addition to the survey data collected, our analysis and conclusions rely heavily on the informative interviews that were conducted with teachers and administrators at School C in December, 2016. Voluntary interviews with these participants lasted from thirty to ninety minutes and were recorded, then later transcribed for analysis. Survey-takers at all schools were invited to participate in these interviews; however, we ultimately decided that agreement to participate, time constraints of the study, and logistics would limit our pool of interviewees to educators from School C. Two main factors were most influential in this decision. First, Author 2 teaches at School C and had convenient access to and rapport with voluntary interview participants. Second, School C has a documented history of attempts to incorporate various features of the integrated curriculum with a level of fidelity that could not be established with other participating schools.

Although the surveys were distributed and completed before the interviews, analysis of the data from these surveys did not take place until after the interviews were completed. The sequential nature of data collection was not a purposeful part of our research design and did not affect our intended methods for analysis.

Interview Protocol

We conducted twelve face-to-face interviews with high school educators. Our interview population included: seven teachers of core subjects, four teachers of non-core subjects, and one administrator (Table 3.) The pseudonyms used to identify participants in the interviews include a letter and a number. The letters used, C, N, A, indicate whether the participant is a core teacher (C), a non-core teacher (N), or an administrator (A.) The numbers were assigned at random to serve as a differentiator among participants. The core teachers interviewed included two biology teachers, one physics teacher, two history teachers, and two English teachers. Non-core teachers included a one physical education teacher, one business teacher, one technology teacher and one Spanish language teacher. Finally, the administrator is an assistant principal whose responsibilities are primarily associated with curriculum and instruction.

Table 3

Interviewee Pseudonyms, Content Areas, and Years of Service

	Core Subject Teacher - C Non- Core Subject Teacher – N Administrator – A2	
Pseudonym	Content Area	Years of Service
C1	High School Biology	10 years
C2	High School Biology	25 years
C3	High School Physics	10 years
C4	High School English	7 years
C5	High School Social Studies	15 years
C6	High School English	10 years
C7	High School Social Studies	14 years
N1	High School Business	5 years
N2	High School Spanish	6 years
N3	High School Physical Ed./Health	17 years
N4	High School Technology	8 years
A2	High School Assistant Principal	15 years

Both of us were present for two of the interviews, the remaining ten were conducted by Author 2. Each interviewee is a professional colleague of Author 2, and all interviews took place at the school in which he currently works. The time and setting of the interviews was in various classrooms and offices during the week of final exams when students were dismissed early. The relaxed atmosphere, the familiarity of their own personal space, and the pre-existing rapport of Author 2 with the interviewees lead to thoughtful and candid responses. These conditions also lead to lengthy discussions on topics and interests that were specific to the school, therefore interviews ranged from thirty to ninety minutes in length.

Data Analysis

The data were collected and analyzed using a mixed-methods approach. Features of this design were maintained throughout the analysis and interpretation of the data collected. Priority was given to the quantitative data collected through surveys with qualitative data from the interviews used to support and rationalize the survey data. This design allowed us to collect the two types of data simultaneously and elaborate upon the closed-response items included in the survey.

Our initial analysis of the data collected from surveys included identifying patterns of responses among survey sections. We identified which participants were most likely to implement an integrated curriculum based upon their self-reported frequency of practices associated with the three key features identified in our conceptual framework. From the survey, we also identified patterns associated with value of individual 21st Century Skills and grouped participants based upon these patterns. We based our analysis of responses on tabulations, sums, and medians; although we were tempted to use average responses of survey participants to identify trends. However, "As a general rule, mean and standard deviation are invalid parameters for descriptive statistics whenever data are on ordinal scales" (Allen & Seaman, 2007, p. 64). As our Likert-scale measurement was indeed an ordinal one, we relied on methods mentioned above as well as Five-Number Summaries, and p-values obtained from a Fisher Exact Probability Test when appropriate.

Much of our presentation of this quantitative data in chapter four is expectedly numerical, we also analyzed some of our qualitative data through a numerical lens after initially analyzing the interviews using manual coding processes. This included

tabulating specific terms related to the integrated curriculum and 21st Century Skills. The

manual process for coding was not an easy one; however, in an attempt to avoid our

energies being focused on the software rather than the data, we used time-tested practices

for open followed by axial coding of the transcriptions of each interview. Patterns,

themes, categories, and subcategories emerged as we independently took notes in the

column we added alongside the printout of the interview transcripts, and as we

highlighted statements from participants that specifically mentioned key features of the

integrated curriculum or 21st Century Skills.

We started each interview with scripted questions that were designed to ascertain

teachers understanding and perceptions of 21st century skills as well as integrated

curriculum (Appendix D). After the initial questions, however, we gave the interviewees

a great deal a latitude with the direction in which they took the conversation, and used

directional questions when necessary in an attempt to keep the interview on topic. We

collected more than fifteen hours of interviews which after transcribed, produced over

200 pages of data. Next, we independently performed two cursory readings of the

transcripts before independent axial coding, and later a comparison of notes and

observations. Using our primary and secondary questions as a guide along with patterns

that were observed in the survey data, we aggregated the interview data into themes

presented by sub-questions in our analysis: What are the preferred features of the

integrated curriculum? How is student involvement practiced? and, why do teachers

value certain skills more than others? The interviews were invaluable in answering our

secondary question regarding barriers to the integrated curriculum at the secondary level.

During our literature review, we identified the following as potential barriers: Economics

and the testing culture; ambiguity and the effect of jargon; teacher perceptions, attitudes and the maintenance of tradition. However, our interviews revealed that the two primary barriers are most likely time and testing.

The independent analysis of the survey data and transcribed interviews followed by the convergence of our independent findings provides inter-rater reliability and adds to the trustworthiness and validity of these analyses. As our data collection from surveys and interviews is admittedly limited, our analysis also considers related literature as a point of comparison for some of our findings. This consideration provides a truly triangulated, reliable model for the analysis of our data as seen in Figure 2.

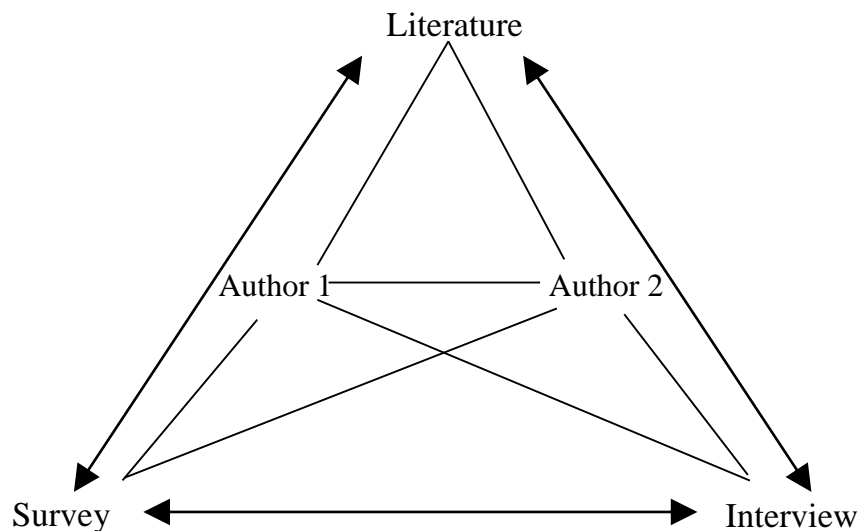*Figure 2*. Triangulation and inter-rater reliability of analysis

Limitations

There were two limitations to our study. Two facets of teacher participation limited the data that we gathered. First, the voluntary participation of respondents was outside of our control. School principals invited to share the survey with teachers were trusted to distribute to all faculty. Whether or not this was the case and the total number

of teachers who ultimately participated were viewed as limitations. Additionally, the completion of the survey was a factor beyond our control. Sixty participants met our inclusion criteria for data analysis, yet only fifty-two completed all survey items. These factors limited our data collection, which in some ways limits the generalizability of this study. However, these limitations did not adversely affect our methodology or our ability to answer our research questions.

Summary

In this chapter, the considerations and procedures of our research were identified in relation to the mixed-methods approach used throughout this project. Preference for quantitative practices was given to offer objective, quantifiable evidence supporting an interrelationship between the integrated curriculum and 21st century Skills. However, qualitative data was also important in supporting quantitative findings and in fully answering our research questions. Our original intent to include student assessment data was not realized for this study; however, our exploration of teacher practices and perspectives through data we were able to collect allowed for valid findings related to our proposed research.

The conceptual framework was the basis for the development of our survey items measuring the practices and perspectives of teachers regarding features of the integrated curriculum and skills deemed important for the 21st century learner. We purposefully avoided using the terms "integrated curriculum" and "21st Century Skills" in the survey to eliminate the possibility of jargon bias. Survey items were developed to gather data reflective of practices and perspectives of various strategies and behaviors rather than practices and perspectives limited to interpretation of terminology. Interview questions,

on the other hand, did include such terminology. In these interviews we were able to ask

follow-up questions and contextualize responses that may have been influenced by the

terms "integrated curriculum" and "21st Century Skills."

The purpose of this study was to explore interrelationship between integrated

curriculum and 21st Century Skills rather than provide parametric data. Through the

intentional design, procedures, and subsequent analysis we uncovered findings that not

only answered our research questions, but provided avenues for future research that may

lead to empirical support for the integrated curriculum as an ideal method for the

development of 21st Century Skills.

Chapter 4

Findings.

Our conceptual framework identified the three features of the integrated

curriculum as necessary components to supporting students as they develop 21st Century

Skills. Based upon this conceptual framework, we developed a survey to measure the

frequency of practices associated with the integrated curriculum and teacher attitudes

related to individual 21st Century Skills. We found that teachers who are more likely to

integrate the curriculum also value 21st Century Skills more than teachers who are less

likely to integrate the curriculum. We also found through the survey that the traditional

paradigm of what schools ought to look like is reflected in reported values of individual

21st Century Skills. Respondents reported that self-regulatory skills are preferred while

digital literacy skills are least valued.

In this chapter, we describe how these perspectives, along with others, may

impact the implementation of practices related to student involvement in curricular

planning which is the least-practiced feature of the integrated curriculum. These findings were supported by interview data which also provided insight to the preferred features of the integrated curriculum and barriers to its implementation at the secondary level. The intended narrative-style reporting of our findings in the following paragraphs explores the survey and interview data following the same path taken during our analysis. Thus, findings are not necessarily reported following a standardized pattern; but rather fully develop answers to our research questions in an organic way to incorporate the complementary findings of quantitative and qualitative data.

Primary Research Question: What is the Interrelationship between the Integrated Curriculum and 21st Century Skills?

To determine interrelationship, we first had to explore perspectives and practices of the integrated curriculum and 21st Century Skills as separate entities. Surveys were first analyzed by establishing patterns of the most frequently practiced features of the integrated curriculum. Following this, we analyzed survey items that measured the value each participant placed on individual skills identified in the literature as ideal for the 21st century learner. Frequently, patterns that emerged from the survey analysis were also evident in the interview responses collected. Once understandings of the integrated curriculum and 21st Century Skills were established separately, we were then able to discover an interrelationship between the two. In the sections below, we describe the processes and findings at each level of this analysis, leading to our discovery of an interrelationship.

Integrated curriculum. The first challenge to answering our primary question, "what is the interrelationship between integrated curriculum and the teaching of 21st

Century Skills?" was defining the integrated curriculum. Defining an integrated curriculum turned out to be no small feat. Considering multiple perspectives and sifting through the work of various authors, we established our conceptual framework which, in part, identifies that there are three key features of the integrated curriculum: (1) Consideration of the real world, making practical applications of learning essential to curricular planning; (2) authentic connections among content areas as an essential piece to real world applications as no one content area exists alone beyond school walls; (3) and negotiation with students to involve them as reflective learners and help determine what still needs to be mastered in order to meet goals. We purposefully avoided using the term "integrated curriculum" in our survey items, thus avoiding any bias or perceptions that could alter responses; however, we gathered teacher perspectives and definitions of the integrated curriculum during our subsequent interviews. The mixed methods design of our research provided survey data related to frequency of practices associated with the integrated curriculum and the interviews provided perspectives that rationalized these practices. We found that there are clear patterns of frequency when it comes to practice of the three key features of the integrated curriculum.

   Sub-question: What are the preferred features of the integrated curriculum? As perceptions and definitions of the integrated curriculum varied among authors, it was no surprise that interview participants had varying definitions of integrated curriculum as well. We found that the interviewees used thematic buzz-words like, "interdisciplinary," "cross-curricular," "transdisciplinary," "project-based learning," "inquiry learning," and, "multidisciplinary" to define the integrated curriculum. While these participants all teach at a school that has, over the years, implemented features of the integrated curriculum

with varying degrees of frequency and success, the definitions that were offered

described the uniquely developed understanding of the concept of each interviewee.

These descriptions revealed that consideration of the real world and authentic

connections among content areas were generally preferred, while student involvement

was given little consideration. This supported our survey findings in that perceptions of

what an integrated curriculum is coincides with frequency of practice.

Interviewees were asked to provide their own personal definition of an integrated

curriculum and, more often than not, they cited planning practices that would fall under

the feature of authentic connections among content areas. For example, interviewee C1, a

biology teacher with over ten years of experience, said that he was not familiar with the

term specifically. However, C1 did offer an explanation of integrated curriculum that

included the alignment of curricular goals, building bridges and connections between

content topics. Another core teacher with seven years of experience at the high school

level, interviewee C4, said that he believed it to be curriculum that closely aligns, brings

together, make bridges or connections between different disciplines in order to be applied

to a project that requires the knowledge and skill of different disciplines. Non-core

teachers of Business and Spanish, N1 and N2 respectively, had similar ideas. These

teachers also cited the "bridging" of courses to meet goals that required knowledge and

skills from more than one content area.

To elaborate upon and justify these connections, interviewees described the

importance of the consideration of the real world. Beyond defining the integrated

curriculum, these participants continued to focus on real world applications, as regular

reference was made to the knowledge and skills that students may require in future

endeavors. This was the primary focus of much of the responses from interviewee, A2.

This administrator discussed "service learning" and "apprenticeship" opportunities at

length, and viewed these as ideal programs to combine a variety of content-specific

understandings and skills. Others cited "college and career readiness" as an objective for

making interdisciplinary connections among courses. These observations of the

interviews supported the data collected from survey items on which participants indicated

the highest frequency of practice associated with the features of consideration of the real

world and authentic connections among content areas.

When interviewees referred to practices associated with authentic connections

among content areas, there were two main ideas that emerge. First, teachers considered

lesson-specific connections within the same, or closely related, content area. For

example, three science teachers that participated in the interviews, C1, C2, and C3,

offered ideas that an integrated curriculum ought to make connections among biology and

chemistry or mathematics and physics. Similarly, teachers of humanities courses, namely

English Language Arts (interviewees C4 and C6) and social studies (interviewees C5 and

C7), described seeking, "natural connections." As C5, a social studies teacher with over

fifteen years of experience, pointed out, connections can be made between literature and

historical time periods, citing specifically an interdisciplinary study of World War I and

the novel, *All Quiet on the Western Front*. Thus the "bridging of content" appears to be

considered within disciplines, which complements the next idea that emerged from the

interviews.

The second idea is that these connections are generally thematic. Finding thematic

connections among complementary subjects that fall within the same discipline requires

less deliberate planning than conceptual connections among a broader range of content

areas. Interviewee C3 pointed out, certain skills transcend any single content area, but

attempts to connect his content with that of the humanities is challenging, and are tertiary

at best. This may be due to the focus on thematic connections, repeated time and again by

his colleagues, as themes are naturally content-driven. Of the twelve interviews, only two

participants specifically examined possible conceptual connections that could lead to a

greater frequency of cross-curricular planning. One of these interview participants, N3, is

a Health and Physical Education teacher who has actively sought out opportunities to

incorporate other disciplines into her classes. For example, she has asked her colleagues

about what their learning goals are and then has discussed with students how the concepts

of "systems" or "growth" explored in her course are related to government or algebra.

The other interviewee that described connections beyond those of themes, A2, did not

cite any specific concepts, but she did identify service learning projects as a way for

students to combine various content in authentic ways. Her ideas of bridging various

disciplines with a focus on real world applications highlights the way in which these two

features of the integrated curriculum naturally go hand-in-hand from the perspective of

educators.

Similarly, the survey revealed that authentic connections among content areas

served the greater purpose of creating experiences that may be considered real world. We

analyzed the responses of sixty participants to three items, one for each feature, regarding

planning practices associated with the integrated curriculum: "I consider real world

applications of SKILLS that students are to learn while planning my course goals and

objectives" (consideration of the real world); "I consider content outside of my specified

discipline while planning my course goals and objectives" (authentic connections among

content areas); and, "I provide designated class time for discussion with students to help

plan the direction of upcoming units" (negotiation of content with students.)
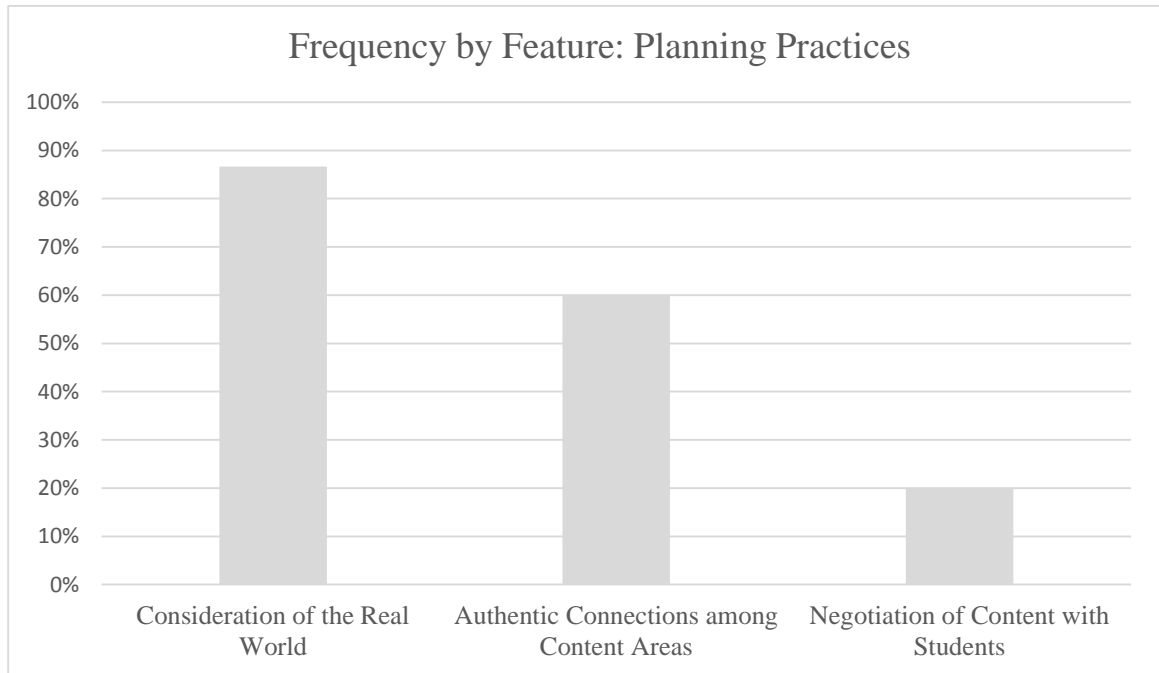
Figure 3. Regularity of planning practices of key features

Of the three features, respondents indicated that they practice planning with the

real world in mind more often than the other two features of the integrated curriculum.

Nearly 87% of all respondents regularly consider real world skills while planning course

goals and objectives. Planning practice associated with the second key feature, authentic

connections among content areas, also appears to take place with a consistent pattern of

regularity as 60% of all responses to this item on the survey indicated "Always" or

"Often." Figure 3 illustrates frequency of regular practice for each feature in terms of

planning. We considered "Always" and "Often" responses to indicate regularity. If one

were to observe the planning or assessment practices of teachers who responded in this

way, one would most likely notice the practice taking place on any given day.

Percentages were determined by tabulating the total of "Always" and "Often" responses

for each item, then dividing by 60: The total numbers of respondents considered.

Consideration of the real world and authentic connections between content areas

were the most well-understood and frequently practiced among interviewees. The third

concept, negotiation of content with students, was completely absent from the definitions

provided by interviewees and was not mentioned at any other point during the interviews.

These interview findings align with the data provided from our surveys which indicate

that 20% of respondents regularly provide designated class time for students to contribute

to planning of upcoming units. While the interviews alone reveal little about negotiation

with students, analysis of the survey items related to this key feature revealed that this

does not indicate that teachers are not considering student perspectives. However, as the

absence of this key feature from the interviews may indicate, active incorporation of

student voice is infrequent.

Sub-question: How is student involvement practiced? Figure 3 above illustrates

that negotiation of content with students is the least regularly practiced feature of the

integrated curriculum when we consider responses to items that measure frequency of

planning practices. However, some survey items also measured frequency of assessment

practices related to the features of the integrated curriculum, which revealed some

interesting results. Responses to six items regarding frequency of practice-- including one

item relevant to planning and one item related to assessment-- for each of the three

features is illustrated in Figure 4. As with the analysis described in the previous

subsection, we focused here on regularity of practice by identifying the percentage of

participants who responded "Always" or "Often." As we looked at frequency of practice

related to the planning and assessment of the third key feature, negotiation with students,

we observed that all teacher participants are more likely to consider student perspective

during individual assessments and evaluations than to actively involve students in

planning. We consider the possibility that this switch in pattern may be due, in part, to the

phrasing of the items.
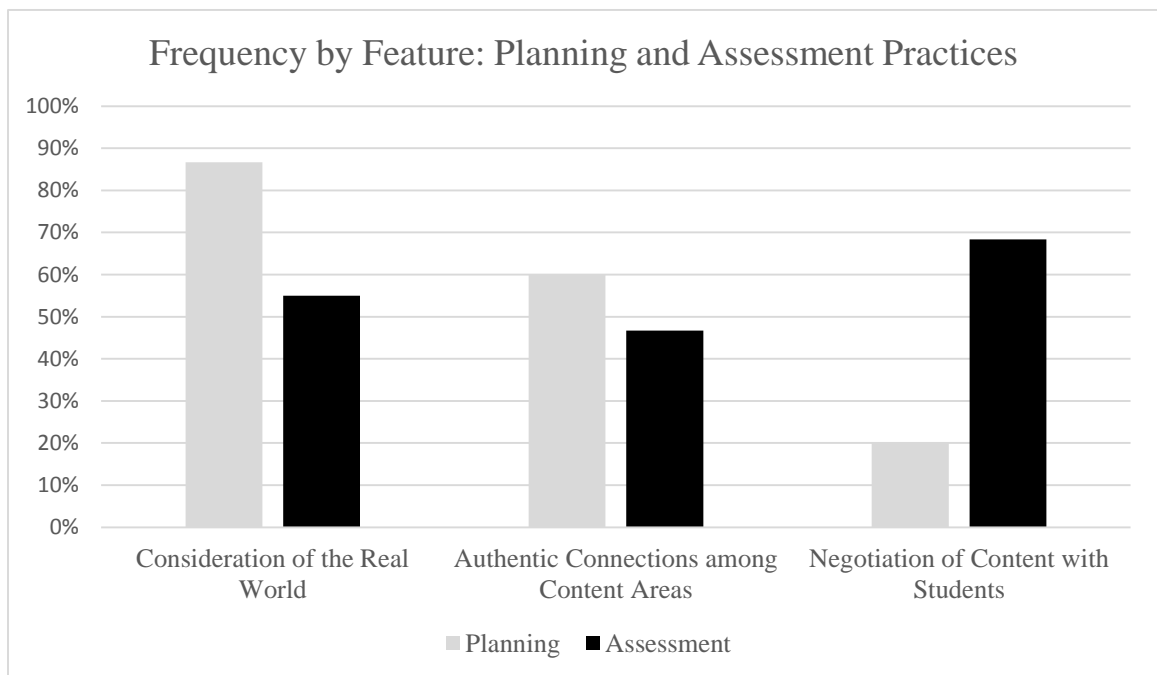
Figure 4. Regularity of planning and assessment practices of key features

While the items related to assessment of real world and interdisciplinary

connections focus on observable action, the item related to assessment related to

negotiation with students is a self-reflection of the respondent's mental process.

Responses among all teachers to this assessment item indicate that it is more regularly

practiced than all other planning and assessment practices measured here, except for

planning real world applications of skills. This reveals that respondents value the

individuality of students and their perceptions, but perhaps not enough to include them in choosing the direction of upcoming lessons and units. To further explore this, we expanded our review of the data beyond the two items initially used for identifying practices related to this feature and investigated data for all items related to negotiation with students during planning and assessment.

There were five total items on the survey related to the planning and assessment through the lens of negotiation with students. As stated above, teachers were more likely to indicate regular practices associated with consideration of student perspectives during assessment than including students in planning. We explored the possibility that the phrasing of the assessment item may have impacted responses, and upon review of the other items related to this key feature of the integrated curriculum, we find more evidence that this may be the case. The assessment item, "I consider student perspective during individual assessments/evaluations" (item 2.8) and another item related to planning, "I consider student interest while planning my course goals and objectives" (item 2.9) are practiced far more frequently than other items related to negotiation with students. Seventy-eight percent and 68%, respectively, of respondents regularly engage in these practices.

However, when the phrasing of items shifts from consideration to observable action, there is a drastic decline in regularity of practice, illustrated in Figure 5. This was
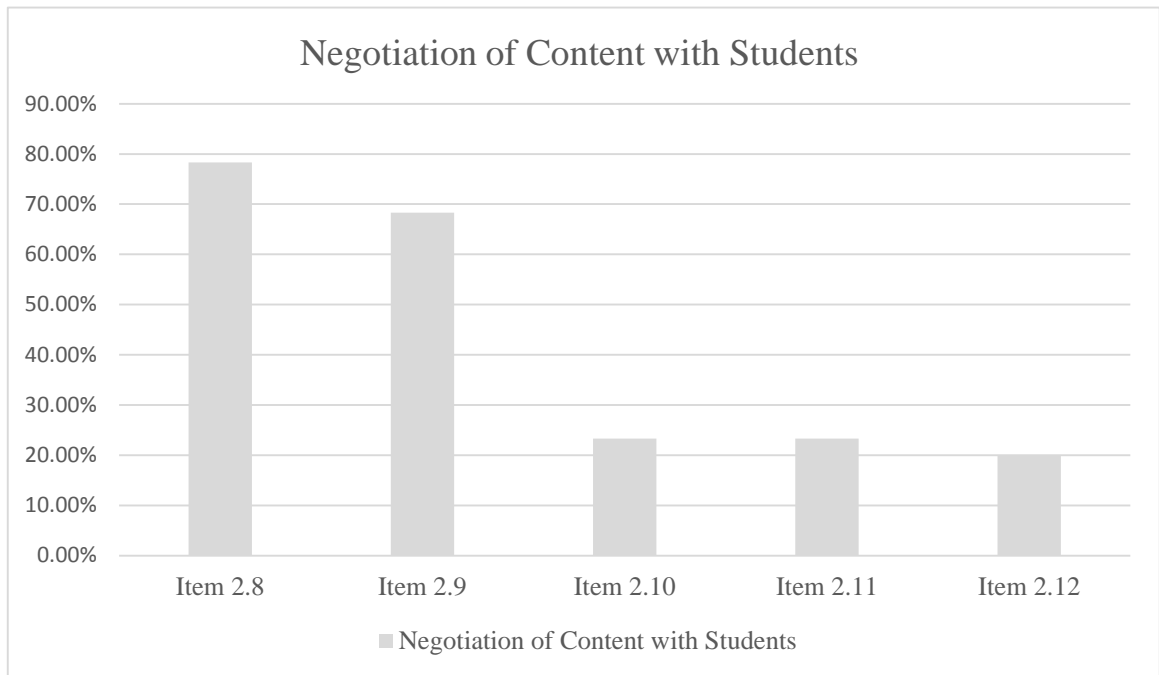
Figure 5. Regularity of practice for items related to negotiation of content with students

established above with survey item 2.12, "I provide designated class time for discussion with students to help plan the direction of upcoming units" receiving indication that only 20% of all participants regularly practice this, and is supported by two other items that measure frequency of involving students in planning. For items 2.10 and 2.11, "My students have a voice in planning course goals and objectives," and, "My students have a voice in planning content-related topics," 23% of all respondents regularly practice these items. From these responses, it appears that teachers *consider* student perspectives during planning and assessment, but are far less likely to invite them to share such perspectives. Therefore, it may be inferred that teachers value student interest and individuality; however, it is a challenge to regularly include student input.

Further supporting this, student interest and individuality of students were commonly cited as justifications for open-ended responses to the item that invited teachers to elaborate on their level of agreement with the statement, "Some classes are more important than others." Seventeen of the forty-one participants who chose to comment explained that, depending on the student, some classes may be more valuable. Interestingly, participants used this argument both for and against the stance that "some classes are more important than others." It appears that the teachers who agree with this statement *and* described the importance of student interest/individuality in their open-ended response evaluated this item from the perspective of the student. As one respondent who strongly agreed that some classes are more important put it, "Some classes have more applications to the life and interests of students and are thus more meaningful and important." While the item that immediately preceded the open-ended response was intended to gather information about perspectives related to authentic connections among content areas-- several authors, reviewed in chapter two, mentioned perceptions of importance being a barrier to interdisciplinary collaboration-- these follow-up responses revealed much information about the perspectives of teachers related to all three key features of the integrated curriculum, most notably the negotiation of content with students.

21st Century Skills. The variety in responses indicating value of the 21st Century Skills was less observable than the variety in responses indicating frequency of practice of the integrated curriculum. It appears that more often than not, responding teachers do indeed highly value the skills categorized as "21st century." So much so that when evaluating the median response of all respondents regarding the importance of each

individual skill, no single item rated for importance had a median response lower than

"Very Important." In this section, we more carefully examine the responses to thirty-eight

items regarding the perceived value of 21st Century Skills for fifty-two participants. Eight

respondents from the original group of participants included in the analysis of frequency

of practice described in the previous section chose not to respond to at least one item and

therefore were eliminated from this analysis as the inconsistency may have invalidated

findings.
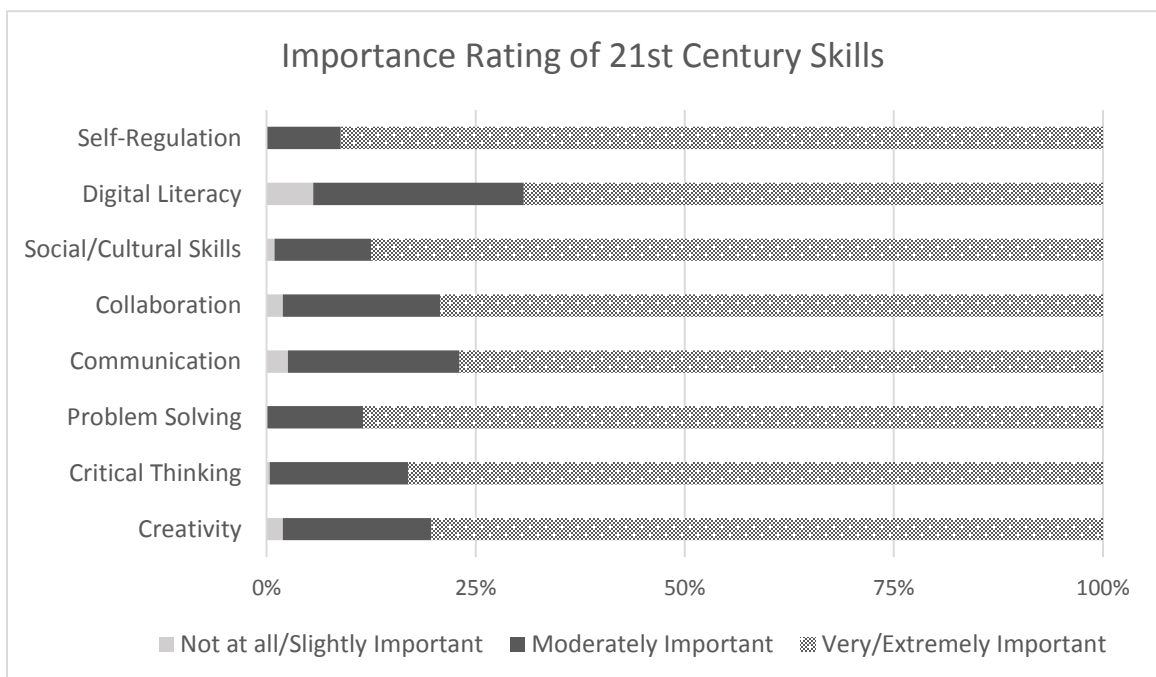
Figure 6. Importance rating of 21st Century Skills

Figure 6 illustrated what was described above, that each of the 21st Century Skills

is more often than not regarded as being valuable when considering all respondents.

Tabulations used to create Figure 6 placed responses into one of three groups: Extremely

or very important; moderately important; and slightly or not at all important. Each skill

presented in this table was represented by three to nine individual items. Percentages

were determined by dividing the total of the group of responses by the total number of

responses collected for items related to that skill. This chart also revealed that certain

skills are more consistently given these higher ratings of "Very Important" or "Extremely

Important" than others. Also revealed above are the skills that, to some survey

participants, were less valuable and earned classification of "Not at All Important" or

"Slightly Important." At first glance this analysis led us to believe that our survey

respondents found digital literacy skills to be the least important, comparatively speaking.

To be sure, we performed another analysis of these survey items, this time examining

each individual item and ranking it among all others.

The analysis we used to illustrate responses by skill (Figure 6) was cumbersome

for thirty-eight separate items; and analysis based upon the two highest ratings (similar to

the process described above for regularity of practice of the integrated curriculum) did

not reveal many patterns as these types of responses were so frequent for every item

overall. Therefore, to rank each individual item, we calculated the sum of all responses

for each item and ordered them from greatest to least. The median sum of responses per

item was 164. When we reviewed items that summed below the median, we found that

each one of the nine items related to digital literacy fell below this mark. Two of them

were close to the median: "Understand basic computer functions," and "Search, select,

process, use and present relevant information," each summed 163. Three other items

related to digital literacy fared relatively well and were mixed in amongst items related to

creativity, problem solving, critical thinking, communication and collaboration that also

summed below the median. However, we found that the four lowest-ranked items based

upon sum were digital literacy skills. At the bottom of the list was, "Interact with

software of various devices."

Similarly, we found that our interviewees rarely mentioned skills outlined in the digital literacy items on the survey. While coding, we highlighted ideas related to student skill development that could be categorized as one of the eight 21st Century Skills outlined in our conceptual framework. Only one interviewee, A2, specifically mentioned "technology" as something to be mastered. She later elaborated that students must know, "the difference between your personal online presence and your professional online presence, and how to make sure those don't overlap or interrupt where you're trying to go." We consider this statement to describe two digital literacy items on the survey, "Practice internet use, security, and privacy," and, "Participation with and metacognitive reflection of personal media use," both of which fell below the median sum of individual items. The latter of these two items was ranked 36th out of the thirty-eight items. Any other instance when interviewees mentioned skills that we related to digital literacy, they specifically describe research as the primary objective. This supports the survey results that, while just below the median sum, the skill "Search, select, process, use and present relevant information" was viewed as most important of the digital literacy items.

At this point we began to consider some of the skills as parts of larger groups. While there are eight skills considered, each one represented by three to nine items on the survey, we determined that many of these eight skills (creativity, collaboration, communication, critical thinking, problem solving, self-regulation, social and cultural skills, and digital literacy) may be viewed as sub-skills of larger groups. Figure 7

Higher-Order Thinking ⟷ Socialization

Creativity

Critical Thinking

Problem Solving

Digital Literacy →

Self-Regulation →

Communication

Collaboration

Social &
Cultural Skills
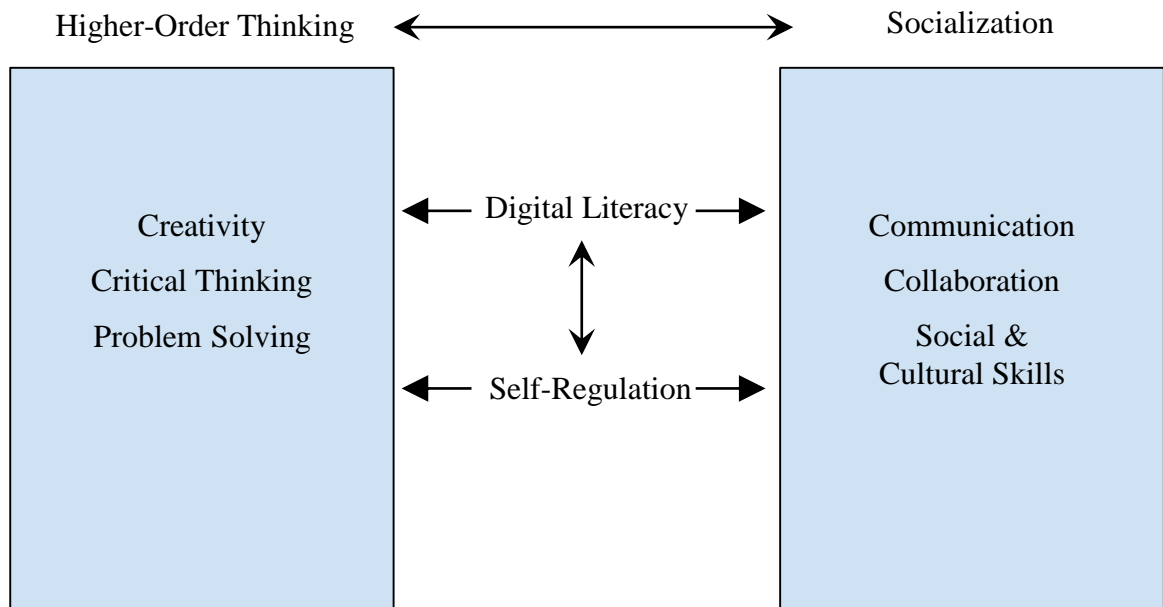
Figure 7. Grouping and relationships among skills

illustrated how we considered the various 21st Century Skills as either stand-alone or parts

of larger groups of skills. As illustrated, we view the groups of higher-order thinking

skills and socialization skills, along with the stand-alone skills of digital literacy and self-

regulation, as interrelated. Successful development of one skill, or skill group, is

contingent upon other skills. While every individual certainly has areas of strength and

weakness, we argue that no skill exists in a vacuum. To offer some examples:

socialization and learning from the perspective of others can lead to more creative

products and more opportunities for higher-order thinking; excellent problem solvers

will, no doubt, benefit from evaluation of personal behaviors that affect collaboration;

and digital literacy loans itself to the development of all other skills in one way or another

for the 21st century student.

Considering the same survey data through this different lens, we again tabulated responses for the above described response groupings; but this time, we considered items for the larger groups, higher-order thinking and socialization, alongside the stand-alone skills of digital literacy and self-regulation (Figure 8.) This new perspective, and generalization of some of the individual skills, allowed us to glean more information from our interview analysis, since these participants spoke in mostly general terms when referring to skills that they valued. In line with the data visualized in Figure 8, interviewees frequently mentioned skills that we categorize as higher-order thinking skills. For example, the science teachers, C1, C2, and C3, and A2 (a former science teacher) that were interviewed made specific mention of "inquiry" and the development of questions by students based upon their own curiosity.
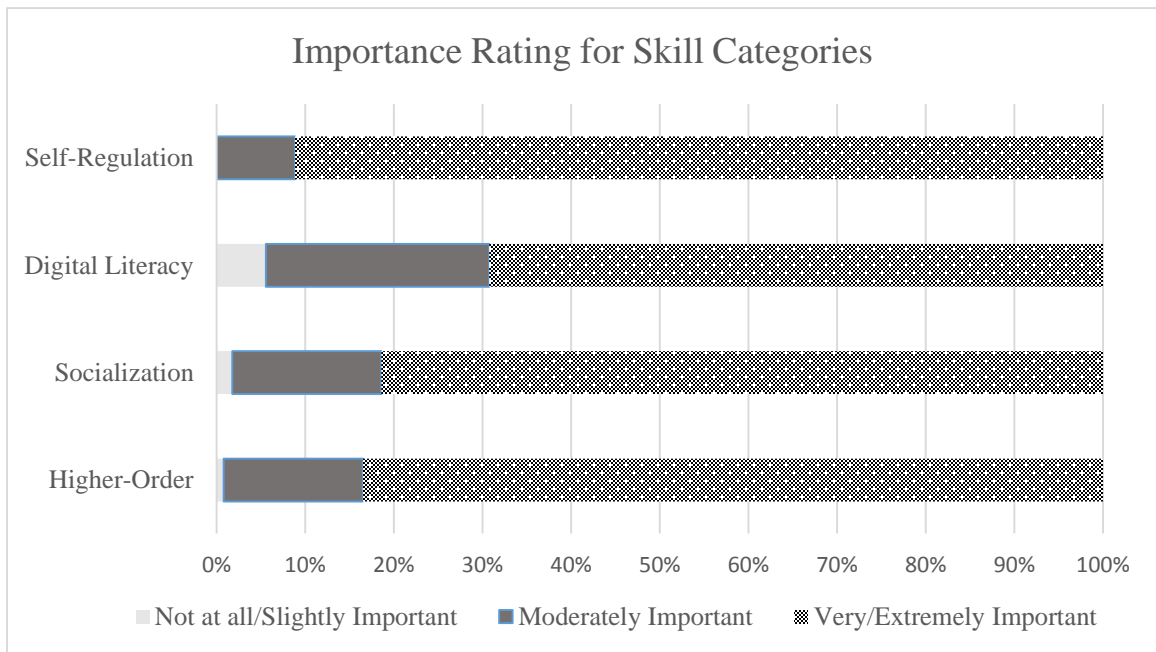

Figure 8. Categories and stand-alone skills

This second point is reminiscent of the data which revealed that teachers are likely to regularly consider student interest while planning in that curiosity is oftentimes

piqued by interest. However, when we consider the individual items categorized as "higher-order thinking", the lowest-ranked skill of this group was, "Metacognitive practices." Similar to our conclusion earlier that teachers value student interest but do not actively seek student input, we find here that teachers may value student inquiry and curiosity, but do not necessarily value student self-reflection on learning.

   Sub-question: Why do teachers value certain skills more than others? The term "metacognition" is a relatively new one. John Flavell coined the term in 1979 to refer to "thinking about thinking" (Flavell, 1979, p. 906). The two items that specifically mention "metacognition" ranked comparatively low as we considered all thirty-eight items. However, three other items that alluded to metacognitive practices received indications of higher importance. Two items, one categorized as a social/cultural skill and the other an item related to self-regulatory skills, included the term "self-awareness"; and another item of the self-regulation skillset, "Ability to prioritize, monitor, evaluate, and reflect upon personal behaviors," each summed reasonably above the median. We surmised that this result may be for two reasons. First, it could be that teachers are reluctant to endorse the term "metacognition" because of its relative newness and possible categorization as educational jargon. As previously discussed in chapter two, jargon in and of itself can be a barrier to embracing practices. The second reason is that these three items reflective of metacognitive practices, yet avoid using the term specifically, have something else working in their favor. The behaviors described by these items contribute to the harmonious environment of the traditional classroom.

   As high school educators, we understand and appreciate the need for this perspective. It is not easy to ensure the learning of thirty students per school period

without some level of decorum in the classroom. "Management" associated with maintaining the learning environment is so important, in fact, that it is explicitly stated in two of the three quality indicators for the standard, "Positive Classroom Environment," outlined by the teacher evaluation system of the Missouri Department of Elementary and Secondary Education (2013). Therefore, it is not surprising that skills associated with self-regulation and positive interactions with others would be deemed highly valuable. What is surprising, however, is that the two highest-valued items among teacher participants ("Recognize short and long-term consequences of personal choices and actions," and, "Take responsibility for personal choices and actions") are indicative of student awareness of undesirable outcomes due to misbehavior. We determined that the terms "consequences" and "take responsibility" ultimately reflect compliance as a desired skill. While it is not the purpose of this research to answer questions directly related to student engagement versus student compliance, what we do see here appears to be a preference for the latter; especially in light of our findings related to the lack of implementation of student involvement practices associated with the integrated curriculum.

Interrelationship: The integrated curriculum and 21st Century Skills. Up to this point we have discussed our findings regarding the frequency of practices associated with the integrated curriculum and the value placed on individual 21st Century Skills mostly as two distinct entities. Here we explore the interrelationship between the two, identifying how values and practices are connected, and how consideration of the real world and the development of 21st Century Skills appear to be inextricably linked. The first step to this stage of analysis was categorizing survey participants based upon their

responses to items related to frequency of practices associated with the integrated

curriculum, followed by categorization based upon responses to items related to value

placed on 21st Century Skills. In the following paragraphs, we describe the process used

to determine these categories, as well as our findings.

One way that we disaggregated the data from the surveys was by determining

which respondents were most likely to regularly implement an integrated curriculum

based upon indicated frequency of practice. To identify these teachers, we first quantified

the Likert-type scale responses indicating the frequency of practice of key features of the

integrated curriculum: Never=0; Rarely=1; Sometimes=2; Often=3; Always=4. We then

calculated the sum of six survey items related to the intentional planning for

implementation of the three key features of the integrated curriculum, as well as

development and implementation of student assessment associated with these features.

There is a total of seventeen items related to the planning, assessment, and perceptions of

participants regarding the three key features of the integrated curriculum, at this level of

analysis we removed all but six to focus our groupings here on deliberate planning and

assessment practices. These are the same items considered earlier in this chapter (Figure

4). Additionally, in this way we were certain that the sums were equally representative of

all three key features: One item for planning and one item for assessment was included

for each feature. We determined that the responses for the items not considered in this

first level of analysis may have skewed our groupings because they: (a) relied on

speculation of elements outside of the respondent's control; (b) relied on speculation of

student perceptions; (c) provided a personal opinion that, while valuable when we

consider collaborative behaviors, was not necessarily indicative of practices; or (d) was

repetitive of other items for the same key feature, thus would have contributed to an

unreliable sum of practices for all three key features.

Once settling on the six items, listed in Figure 9, that we identified would best

determine likelihood of integrated curricular practices, we determined the participants

that met the inclusion criterion of being a classroom teacher who works directly with

students in a high school, instructional setting. Of the seventy-one total participants, sixty

met this criterion. Next, we calculated the five-number summary and generated a box

	Consideration of the Real World	Authentic Connections among Content Areas	Negotiation with Students
Planning	"I consider real world applications of SKILLS that students are to learn while planning my course goals and objectives."	"I consider content outside of my specified discipline while planning my course goals and objectives."	"I provide designated class time for discussion with students to help plan the direction of upcoming units."
Assessment	"My students are assessed on their ability to apply what they have learned in a real-world setting."	"My students are assessed on their ability to make connections among content areas."	"I consider student perspective during individual assessments/evaluations."

Figure 9. Survey items considered for tabulation and groupings

plot for the sums of these six items for the included sixty survey participants (Figure 10).

These data were used to determine the grouping of respondents into the following: Most

likely to integrate the curriculum; Somewhat likely to integrate the curriculum; Less

likely to integrate the curriculum.

Respondents placed in the Most Likely group had a sum greater than or equal to

the third quartile (18), Somewhat Likely participants had a sum falling in the interquartile

range, but less than the third quartile and greater than the first quartile (17-14); and

respondents in the final group of participants, determined to be Less Likely to integrate
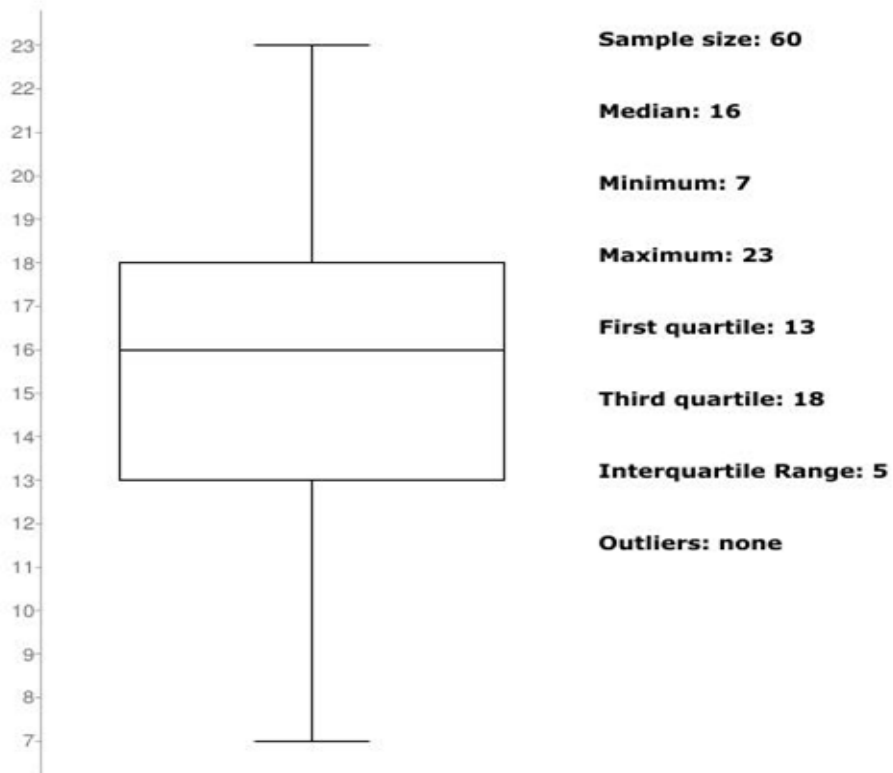
Figure 10. Box plot: Sums of responses to survey items

the curriculum, provided responses for the six survey items that summed less than or

equal to the first quartile (13). We chose to group respondents into three groups because,

as the literature indicates, practices associated with the integrated curriculum are typically

viewed in terms of a continuum; thus, dividing our participants-- based upon responses

regarding the integrated curriculum-- into binary groups was deemed inappropriate.

As previously mentioned, variety in responses indicating value of the 21st Century

Skills was less observable than the variety in responses indicating frequency of practice

of the integrated curriculum. No single item rated for importance had a median response

lower than "Very Important." While a three-category system was appropriate for

grouping respondents based upon frequency of integrated curricular practices-- due to

both variety in response, as well as the aforementioned view regarding a continuum of

practice-- we considered respondents here as either greatly valuing or generally valuing

21st Century Skills. Thus, a three-category system was determined to be unnecessary for

grouping respondents due to the overall general response indicating higher levels of

importance/value for each item.

In order to determine placement into the greatly valuing or generally valuing 21st

Century Skills groups, sums of responses to thirty-eight items regarding the perceived

value of 21st Century Skills for fifty-two participants were calculated. Eight respondents

from the original group of participants included in the analysis of frequency of practice

chose not to respond to at least one item. From the sums of these fifty-two respondents,

we determined that the median sum, 118, would serve as the distinction between

categories. Respondents with a sum greater than or equal to 118 were considered to

greatly value 21st Century Skills overall; and respondents with a sum less than or equal to

117 were considered to generally value 21st Century Skills.

Respondents were tabulated based upon their groupings of Value of 21st Century

Skills and Likelihood to integrate the curriculum. This data was then calculated using

Fisher Exact Probability Test, returning the p-value 0.058719 (Table 4). We determined

that this result indicated the possibility of an interrelationship between value of 21st

Century Skills and likelihood to integrate the curriculum. To further investigate this

interrelationship, a scatter plot was created to compare the sum of items used to

determine each individual participant's likelihood to integrate the curriculum with his or

her sum of responses to items indicating importance of 21st Century Skills (Figure 11). As

expected, based upon the p-value from the Fisher Exact Probability Test, there is a weak-

positive correlation. A conclusive statement about interrelationship cannot be made based

upon these analyses alone, yet the support from other data collected leads us to conclude

that teachers who greatly value 21st Century Skills are more likely to integrate the

curriculum than teachers who generally value 21st Century Skills.

Table 4

Contingency Table: Likelihood to Integrate and Value of 21st Century Skills.

	Most Likely to Integrate the Curriculum	Somewhat Likely to Integrate the Curriculum	Less Likely to Integrate the Curriculum	**Totals**
Greatly Valuing 21st Century Skills	11	12	5	28
Generally Valuing 21st Century Skills	4	9	11	24
Totals	15	21	16	52
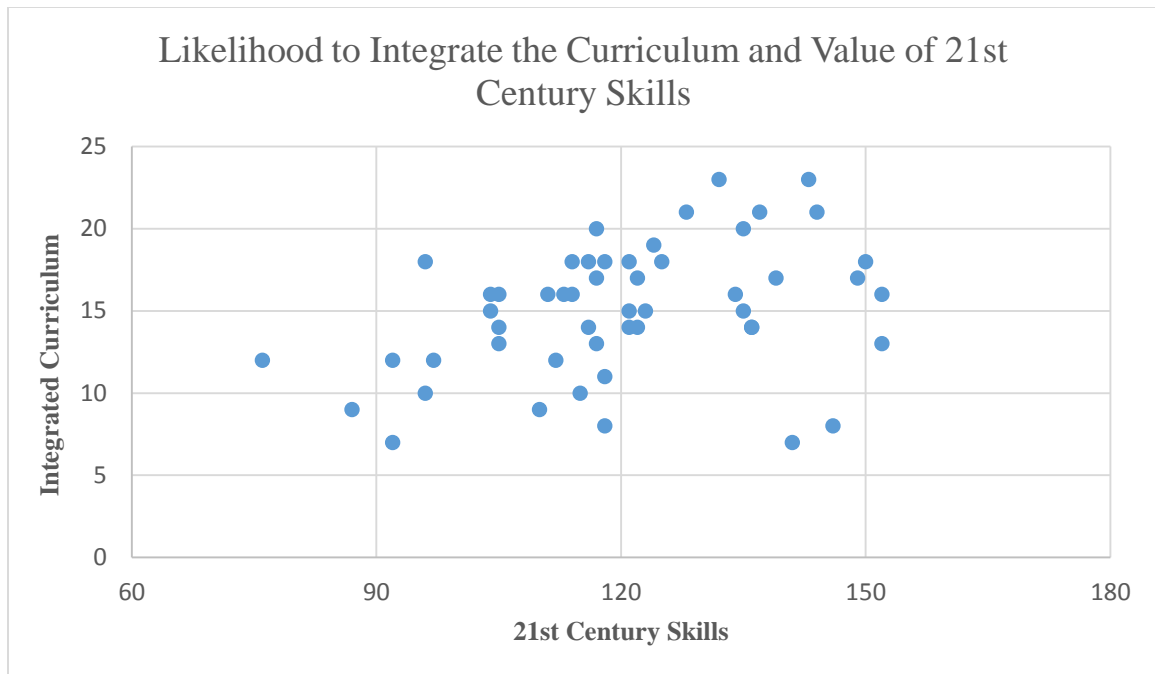
Figure 11. Scatter plot: Likelihood to integrate and value of 21st Century Skills

An integrated curriculum supports the learning of 21st Century Skills, as outlined in our conceptual framework. Therefore, it is expected that teachers who are most likely to regularly implement planning and assessment practices associated with the integrated curriculum also, more often than not, greatly value 21st Century Skills. We rationalize it in this way: If you think it's important that students learn something, you take the necessary steps to ensure that they do. From our analysis of surveys and interviews it becomes apparent that the interrelationship most distinctly lies in the preference for and prioritization of consideration of the real world. Rarely did interviewees discuss the skills that we have outlined as "21st century" without specifically mentioning "real world" applications. For example, C2 said while defining the integrated curriculum and the connections among content areas leading to greater applicability of skills, "Then [students] can apply those skills in a real-world context." His ideas for this centered on problems-based units of study that would focus on real world issues. Another

interviewee, A2, discussed the apprenticeship curriculum at the school as a way for students to develop primarily the "real world skills" of communication, collaboration, and social/cultural skills. Thus, it appears when teachers consider the real world, they are considering the skills that will help students be successful in life beyond the classroom.

This also held true in the free response item on the survey. Of the forty-one participants that provided a justification for their level of agreement to the item, "Some classes are more important than others," eleven teachers specifically mention "skills" as the primary reason courses are equally important. As one respondent, a special education professional who co-teaches world history, put it, "While I believe some classes present information that will be used more than others, all classes teach skills that are essential to know and display outside of the classroom." Another survey respondent, an English teacher, used real world applicability to defend the indication that some classes are indeed more important than others, stating, "Some disciplines have a natural, real-world applications; others will never come up in the students' real lives." The order of items on the survey may be important as we consider these responses in that participants had yet to be prompted to indicate the level of importance for the various items related to 21st Century Skills. Therefore, we infer that skill development with the consideration of real world application garners the focus of classroom teachers on a regular basis without prompting.

Secondary Question: What are the Barriers to the Adoption of an Integrated Curriculum at the Secondary Level?

The educators that we interviewed agreed that interdisciplinary connections were important in order for students to make authentic, real world connections. It appeared that

the consensus among interviewees was that an integrated curriculum may be considered

best practice. Overall, however, teachers were only able to cite intermittent, seemingly

adventitious occasions when some features of the integrated curriculum were a part of

planning their courses. Based upon our literature review, we expected this outcome and

therefore prepared the question, "What are barriers to implementing an integrated

curriculum?" After careful analysis of the interviews, two primary barriers became

evident: Time and testing. In this section of the chapter we explore interview responses,

as well as discuss survey results that support the conclusions made by interviewees

regarding barriers to implementation of the integrated curriculum.

The time barrier. The first barrier that we observed, time, is considered through

the lens of planning and collaboration. Interviewee C6, a veteran English teacher who

focused primarily on this barrier, talked about the struggles of course scheduling and the

ability for teachers to collaborate; as well as the scheduling of students. Due to varying

student needs and abilities, oftentimes teachers who mostly teach sophomore-level

classes have only sophomore students. He went on to describe that much of the

scheduling in his school is driven by the mathematics department, because math "tracks"

students, and the other classes on a student's schedule must fill in the gaps. This leads to

students being placed in various classes with groups of students from more than one

grade level. He described interdisciplinary planning to be a challenge with these

scheduling issues because finding the necessary cross-over of content among students

who are not enrolled in the same courses, much less courses of the same grade-level, is a

lofty expectation. Therefore, when a cross-curricular connection is convenient or obvious

it may take place on a lesson-by-lesson basis; however, currently he does not perceive

any interdisciplinary practices taking place on the curricular planning level.

This interviewee's points of time and schedule organization are not unfamiliar to

us as high school educators. We find that an additional piece to this conundrum is the

scheduling of plan time. Oftentimes, we have observed in our personal experiences,

administrators go to exhausting lengths to ensure that teachers within a department have

common planning periods, but no consideration is made to ensuring common plan time

among teachers of the same grade level. This appears to go beyond our own personal

experience, as survey respondents indicated that they did little collaborative planning

outside of their assigned discipline. When asked to check boxes next to any and all items

that described collaborative planning activities, less than half (40%) of the teachers who

revealed that they determine essential skills and knowledge within their department

indicated that they do the same with teachers of other disciplines. It does not appear that

schools intentionally stifle interdisciplinary planning. Thirty-three percent of survey

respondents indicated that their schools "rarely" or "never" enforce strict disciplinary

boundaries. However, the delegation of time to discipline-specific planning and the lack

of encouragement from administration to create units of study with the input of other

content areas communicates that this type of cross-curricular, collaborative planning is of

little value. As one interviewee, N4, put it when describing administrators, "They're kind

of indifferent. Supportive, but not necessarily giving you resources in terms of time,

money, [professional development.]" He went on to add that, while beneficial to learning,

"cross-curricular connection" is supplemental, "that's something if you can find time, and

you can make it work, and you could pull the strings; that's not necessarily supported by your building."

The testing barrier. The second barrier may be to blame for the organization of time and lack of support for the collaborative planning among content areas. The culture of testing that emphasizes high-stakes test scores as a measure of teacher and student success. Every interviewee mentioned testing as a barrier, some going into great detail. Pages upon pages of transcribed interviews are filled with the pressures and frustrations of teachers with state-mandated end of course exams (EOCs.) English, social studies, and science teachers described that there is not enough time to cover all of the content expected to be mastered for the EOC; therefore, while ideally beneficial to learning, the features of the integrated curriculum cannot be implemented. Other best pedagogical practices may be ignored due to the pressures of testing, as one science teacher, C2, described, "All right, I've got to get through standards one through ten, and everyone's got to get through them. So, sorry, kids if you know this, but we've got to do it for everyone's benefit." A social studies teacher, C7, echoed this sentiment, describing the focus on justifying every classroom activity with a standard. She admitted that creativity and collaborative planning go by the wayside with over 150 standards. An English teacher, C6, summarized the testing-focused barrier by bringing it back to school accreditation. She described that because of the importance of EOC test scores to the school district in terms of Adequate Yearly Progress (AYP) and accreditation, it is absolutely imperative that the students taking that assessment are prepared.

Data collected from the survey revealed that these frustrations may not be limited to the interviewees of this one school. On the open-response item describing whether or

not some classes are more important that others, three participants specifically mentioned

the delegation of classes as "core" or "elective." One respondent who strongly agreed

with the statement "Some classes are more important than others" justified this level of

agreement with, "I am biased as a core teacher." Another respondent who strongly agreed

with the item put it more clearly, "Some are needed while others are electives." The

interviews coupled with these comments lead us to look more closely at the

demographics, specifically the content area, of the survey respondents.

We explored the data collected from each participant regarding both the years of

service as well as content area and discovered patterns among this information within the

groupings we determined for likelihood to integrated the curriculum (most, somewhat

and less likely to integrate.) Table 5 displays these demographic data for each group.

While there does not appear to be a strong correlation between years of service and

likelihood of an integrated curriculum, it is interesting to note that zero respondents in the

1-4 years of service range fell into the most likely to integrate the curriculum group.

There is, however, an observable correlation among groups and whether or not a

respondent teaches a core subject. We identified "core'" teachers as respondents who

indicated their content area as one of the following: science, mathematics, English, or

social studies. "Non-core" teachers are those who indicated any other content, such as

fine arts, practical arts, foreign languages, physical education, or provided a general

response like, "teacher 9-12."

Table 5.

Demographic Information Organized by Likelihood to Integrate Categories

	Most Likely to Integrate the Curriculum			Somewhat Likely to Integrate the Curriculum			Less Likely to Integrate the Curriculum		
		Core	Non-Core		Core	Non-Core		Core	Non-Core
1-4 Years	0 =	0	0	2 =	1	1	5 =	4	1
5-9 Years	3 =	0	3	8 =	7	1	2 =	2	0
10-14 Years	5 =	1	4	2 =	2	0	6 =	5	1
15+ Years	11 =	5	6	12 =	9	3	4 =	2	2
Totals		6	13		19	5		13	4

We classified participants in two different ways and wanted to determine the level of association between them; therefore, we used the Fisher Exact Probability Test for the distribution of Core and Non-Core Teachers among the three groups. While a chi-square analysis was considered, we determined that our relatively small sample size, and low expected values, made the Fisher Exact Probability Test to determine contingency more appropriate. A p-value of .002358 was returned from the test, indicating that there was likely an association among whether or not one teaches a core subject and his or her likelihood to integrate the curriculum. Further analysis of the data collected from the six items measuring likelihood of an integrated curriculum through the lens of Core versus

Non-Core teacher respondents provided more evidence that Core teachers are less likely to implement an integrated curriculum.

We calculated the median for each item among core teacher respondents and among non-core teachers. Non-core teachers had a higher median response (indicative of greater frequency of practice) than core teachers on five of the six survey items considered at this level of analysis. The one item, 2.9, on which both groups of teachers had the same median response stated, "I consider student interest while planning my course goals and objectives." This planning item was previously discussed as having overall high frequency of practice when responses of all teachers were considered. Additionally, when the sum of responses for each respondent was calculated, participants teaching core subjects had a median sum response of 14.5 and participants teaching non-core subjects had a median sum response of 18. Furthermore, Core teachers represent 63.3% of survey respondents included in our analysis, yet these participants accounted for over 73% of the total responses indicating "never" or "rarely" for practices of key features of the integrated curriculum.

Based upon the interviews, we determine that the lack of implementation of the integrated curriculum among core teachers is due to the added responsibility of preparing students for mandated tests. One may argue that, based upon the data we collected on the survey, every survey respondent grouped as a core teacher is not guaranteed to teach a class that has an EOC exam; however, we still view these teachers to have an added responsibility of preparing students for the ACT. Also, three of these core teachers indicated that they teach an Advanced Placement (AP) course that comes with an exam, the score of which oftentimes determines whether or not a student may be eligible to earn

college credit for the course. Therefore, the perception that a core teacher's primary job is

to prepare students for a test serves as a barrier to the integrated curriculum. Even though

research supports the integrated curriculum as a means to increase student potential to do

better on standardized tests (Vars & Beane, 2000; Fraser, 2000) including those aligned

with Common Core State Standards (Petroelje & Frambaugh-Kritzer, 2014);

implementing integrated curriculum remains a hard-sell for teachers and schools that

place so much value on these high-stakes tests.

Summary

In this chapter, we discussed the patterns revealed from our mixed methods

analysis of the quantitative and qualitative data collected from our surveys and

interviews. We found that teachers are more likely to regularly implement planning

strategies associated with the key feature of "consideration of the real world" than the

other two features of the integrated curriculum. The reason for this became apparent as

we examined the interrelationship between the integrated curriculum and 21st Century

Skills. Teachers view the real world and skills deemed "21st Century" as inextricably

linked. Concerning interrelationship between the integrated curriculum and 21st Century

Skills, we found that teachers who are most likely to integrate the curriculum also greatly

value 21st Century Skills; and teachers who are less likely to integrate the curriculum may

only generally value 21st Century Skills.

In addition to the interrelationship among the integrated curriculum and 21st

Century Skills, we identified other patterns that highlighted the continued preference in

the secondary school to maintain the traditional organization of classes, plan time, and

teacher-lead practices. While teachers appear to value student individuality, they do not

prioritize student input when it comes to unit planning or reflection on their own learning through metacognitive practices. Self-regulatory skills are valued more than digital literacy skills which may be due, in part, to the perception that many teachers have the primary responsibility to prepare students to take state-mandated tests. Time, testing, and ultimately teacher buy-in, are barriers to the integrated curriculum. Based upon our findings of interrelationship, this may mean that these are barriers to 21st Century Skills development as well. In the following chapter, we continue to reflect on these results and discuss how the data provided answers to our research questions, as well as a direction for future study of the integrated curriculum as an ideal method to develop 21st Century Skills.

Chapter 5

Discussion and Conclusions.

Schools around the world have adopted 21st Century Skill as a primary goal of education. We discovered in our review of the literature and review of the meta-analysis of 21st Century Skills frameworks by Voogt and Pareja Roblin (2010) that there are eight highly desired skills that fall beneath the umbrella of 21st Century Skills: Creativity, collaboration, communication, critical thinking, problem-solving, social and cultural skills, self-regulation, and digital literacy. Successful practice and subsequent attainment of these skills requires a reconsideration of curricula that have been traditionally compartmentalized. Therefore, we argue that the integrated curriculum and each of its three features provide opportunities for teachers and students to apply and transfer content knowledge and skills beyond the classroom.

Although not necessarily an intended goal of our research, we simplified the concept of the integrated curriculum by identifying its three key features: consideration of the real world, authentic connections among content areas, and negotiation of content with students. Amid the various definitions of integrated curriculum, we observed these three key features to be consistently represented. Instead of conducting our research based upon the definition of one author, we contributed to the current literature by developing our own research-based conceptual framework.

In this final chapter, we summarize our study by reviewing our purpose and research questions. We also discuss how our findings relate to the current literature and contribute to the existing body of knowledge related to features of the integrated curriculum and 21st Century Skills as interrelated entities. The surprising data that revealed the relatively low importance placed on digital literacy skills is explored along with other unexpected results related to teacher perceptions and priorities. We conclude this chapter with implications of the interrelationship between the integrated curriculum and 21st Century Skills, and provide recommendations for educators who wish to improve student development of these highly desired skills as well as recommendations for future research.

Summary of the Study

The purpose of our research was to identify if the integrated curriculum is in fact an ideal method for the development of 21st Century Skills. A model situation for gathering data to explore this concept would have been to find schools that assess 21st Century Skills and evaluate whether or not those schools also implemented an integrated curriculum and to what degree. However, it was difficult to find schools that fulfilled this

desirable research situation. For that reason, we determined that our contribution to the

existing body of research would instead identify the interrelationship between the

integrated curriculum and 21st Century Skills, focusing on teacher perspectives and

practices. Teachers are considered to be the most important school-related factor

determining student success (McCaffrey, Lockwood, Koretz, & Hamilton, 2003; Rowan,

Correnti & Miller, 2002; Wright, Horn, & Sanders, 1997); therefore, our research

provides important insights that support the integrated curriculum as an ideal method to

developing 21st Century Skills in students.

We achieved this through the lens of our primary research question, *What is the*

interrelationship between integrated curriculum and the teaching of 21st Century Skills?

As we analyzed data collected through surveys and interviews, we identified themes and

patterns that led to the development of sub-questions which helped organize our findings

in chapter four. The sub-questions included: What are the preferred features of the

integrated curriculum?, How is student involvement practiced?, and, Why do teachers

value certain skills more than others? These along with our findings related to each one

provided multi-faceted evidence to support the interrelationship between integrated

curriculum and 21st Century Skills based upon the practices and perspectives of high

school educators.

We chose mixed-methods for our data collection and analysis. We considered

both quantitative and qualitative data collected from surveys and interviews with priority

given to the former. This priority was not chosen to discount the qualitative data and

analysis. Instead, we viewed the quantitative data and analyses as a priority because we

intended to avoid basing our findings on "belief rather than science" (Krischner et al.,

2013, p. 169). While we accept qualitative methodologies as reliable and beneficial, we also accept the expectation of quantifiable findings. Statistical analysis through the use of Fisher's Exact Probability Test to determine interrelationship provided a level of reliability to our study. This project had a limited number of participants, so our findings may not be generalizable; however, our quantitative analyses may be replicated in future study of a larger population.

In early January, 2017, Author 2 began coding interviews while Author 1 interpreted survey results. By mid-January, we had switched roles with Author 1 focusing on the qualitative and Author 2 on the quantitative. At the end of the month, we were ready to compare findings and develop answers to our research questions. This mixed-methods approach allowed us to triangulate our findings, and the independent analyses helped maintain inter-rater reliability. Our ability to relate our findings to existing literature coupled with our combined knowledge-base and professional experience ensured a valid and trustworthy analysis.

In our literature review of 21st Century Skills-based education, we found support for using what we have identified as the three key features of an integrated curriculum. We observed that the literature identifying best practices typically highlights one or two of the key features that we have included in our conceptual framework; however, consideration and intentional design of curricula including all of these features, we argue, are ideal for students to develop these skills. Reference to preparing students for the real world and providing students with authentic learning experiences is frequently made in the 21st Century Skills literature (Darling-Hammond, 2006; Dede, 2009; Erstad, Eickelmann et al., 2015; Trilling et al., 2009). The feature of authentic connections

among content areas is communicated through the description of transfer as necessary for 21st Century Skills development (Dede, 2009; Erstad et al., 2015; Kirschner et al., 2013; Landow, 2006). And the 21st Century Skills-focused literature consistently cites student-centered and student-responsive practices (Erstad et al., 2015; Fisser et al., 2015; Golsby-Smith, 2013). However, the literature has yet to provide research that identifies why the collection of these three features is important for teachers as they facilitate 21st Century Skills development. Our findings, while lacking true empirical evidence, contribute to the literature by filling the gap in research that has all but examined the interrelationship between the integrated curriculum and 21st Century Skills development.

Our synthesis of the literature has simplified the definition of the integrated curriculum to make it a more practical option for the most fruitful instruction of 21st Century Skills. This may ease some frustration that comes with identifying methods associated with the term, "integrated curriculum," as well as bring to light the well-intentioned yet incomplete practices currently taking place. Furthermore, our research and analysis yielded results which provide insight into the interrelationship between practices and attitudes that will help administrators and curriculum planners identify the current situation in their schools and provide professional development accordingly.

The major findings of our research included a quantitatively observable interrelationship between integrated curricular practices and perspectives related to 21st Century Skills; as well as specific barriers to the implementation of an integrated curricular method. To answer our primary question, *what is the interrelationship between integrated curriculum and the teaching of 21st Century Skills?*, we found that teachers who are most likely to practice the features of the integrated curriculum also value 21st

Century Skills more than teachers who do not regularly practice these features. Although

our research does not offer evidence of improved development of 21st Century Skills in

students through the integrated curriculum, the interrelationship we found is an important

one. If we accept that educators teach according to their values far more than according to

what they know (Faulkner & Latham, 2016; Palmer, 2007); it is reasonable, then, to

accept our rationale provided in chapter four: If you think it's important that students

learn something, you take the necessary steps to ensure that they do.

   Interrelationship was also established as we found that the over-arching feature,

'consideration of the real world,' and development of 21st Century Skills are inextricably

linked as the goal of having such skills is to be successful beyond the walls of the school.

The caveat to the focus on real world skill development is that the content may suffer.

Although it seems to be an increasingly common belief that content knowledge is

irrelevant with the ability to google any fact at any time, cognitive science reveals that the

active processing of the brain is finite; and therefore, the need to constantly search for

information that has not been encoded in long-term memory leaves little room for other

cognition (Allington & Cunningham, 2006; Deans for Impact, 2015; Willingham, 2006).

This is why authentic connections among content areas and negotiation of content with

students are important. If teachers only focus on planning and assessment practices we

categorize as "consideration of the real world" this may lead to a curriculum with an

over-emphasis on skills which, as presented in our conceptual framework, will naturally

develop as a product of an integrated curriculum that considers all three features. Our

findings revealed that authentic connections among content areas are viewed by teachers

to be a catalyst of real world connectedness, leading back again to the development of

highly desirable skills that some interviewees deemed necessary for "college and career readiness."

We also discovered data revealing interconnections among practices and perspectives related to student involvement and the value attached to the development of metacognitive skills. We found that teachers self-report as regularly considering student perspectives, but do not actively include students in planning. The discrepancy here is problematic in that students will have a hard time wondering about and developing questions for what ought to be learned when they have yet to reflect on what they already know and are able to do. Similarly, survey respondents indicated that metacognitive skills are among the least important relative to other 21st Century Skills measured on the survey. From this we determined that the traditional practice of teacher-centered planning ultimately leads to students being uninvolved receptors rather than engaged, reflective learners.

Active involvement of students in instructional activity is a time-consuming endeavor for many, so it is unsurprising that teachers are not regularly designating class time for planning with students on a curricular level. This appears to be especially true for teachers of core classes who are quantitatively less likely to regularly practice features of the integrated curriculum. We came to the finding that time and testing are barriers to the integrated curriculum through this observation of the survey data along with qualitative data collected from the interviews. Interviewees frequently cited high-stakes testing as a barrier to implementing the integrated curriculum. The time spent on preparing students for these assessments seemed to make practice of the three key features a supplementary activity at best. Thus, we answered our secondary question,

what are barriers to the adoption of an integrated curriculum at the secondary level?,

through finding that core teachers, who are charged with test preparation, are less likely

to practice features associated with the integrated curriculum.

Practices associated with the key features of consideration of the real world and

authentic connections among content areas were identified as more regularly

implemented by survey participants than active practices associated with the third feature,

negotiation of content with students. Furthermore, when describing personal definitions

of integrated curriculum, interviewees did not mention the involvement of students.

While we did find evidence in the survey data indicating that teachers regularly consider

student perspectives, it is important to note that, "instead of speculating on and assuming

what is needed and fitting for students, give young people a powerful voice in curriculum

planning" (Beane, 1991, p. 2). This "powerful voice," as a key feature of the integrated

curriculum establishes the student as an active participant exercising ownership over his

or her learning, increasing commitment and motivation (Cook, 1992; Fraser, 2000).

It appears that well-intentioned teachers who, perhaps inadvertently, practice the

integrated curriculum stumble into the pitfalls of incomplete implementation of the key

features. Teachers may consider the perspectives of students, but do not actively involve

students in planning; they may find adventitious thematic opportunities for

interdisciplinary study, but fall short of making the connections authentic. Various

authors alert educators to go beyond such superficial overlaps and instead to pay careful

attention to authentic and meaningful connections for students (Beane, 1991; Fraser,

2000; Shoemaker, 1989). It appears from our interviews that educators attempting to

bridge content areas are primarily focused on themes and topics. In this way, our findings

do not add anything new to the literature; but we do contribute evidence of current

practices that may serve as a starting point for educators who wish to more fully

implement an integrated curriculum.

 Surprising Findings

In our review of the literature related to 21st Century Skills, we observed that

"technology" and "digital literacy" were mentioned more often than any other skill

considered for this research (Appendix A.) Considering this emphasis and the fact that

our participating schools explicitly prioritize 21st Century Skills, we anticipated that our

results would indicate a high-importance rating for skills related to digital literacy.

However, this was not the case. Each of the nine survey items associated with digital

literacy scored below the median sum of all 21st Century Skills items. The four lowest

rated items were: Practice working knowledge of standard hardware and office

applications; Participation with and metacognitive reflection of personal media use;

Problem solving through appropriate ICT (information and communications technology)

techniques and tools; Interact with software of various devices. The incorporation of

technology is increasing in schools, bringing laptops, iPads, smartphones and other

devices into the classroom, and along with them websites and apps that may effectively

be used for learning; thus, we were surprised by this result. We suspect that these results

may stem from the assumption of teachers that students are already technological experts

(Lee et al., 2010). However, it ought to be a priority of the 21st century educator to teach

digital literacy skills since most students generally have a technology skill base of mostly

superficial interactions with social media and web browsing (Kirschner et al., 2013.)

These results may also be explained by another surprise discovered during our analysis of items related to 21st Century Skills. The skills related to student self-regulation, specifically items that dealt with compliant student behavior, earned some of the highest importance ratings of the thirty-eight items outlining 21st Century Skills. The highest-summing skills, "Recognize short and long-term consequences of personal choices and actions" and "Take responsibility for personal choices and actions" are indicative of the desire of the participants to have well-behaved students in the classroom. As classroom teachers, we understand the importance of these skills, so their overall sums are not necessarily surprising. What surprised us was that no other items were tied with these highest-summing items. Teacher participants were not asked to rank each item, but rather indicate the level of importance using a 5-point Likert-type scale.

We determined that the surprising results of digital literacy items and self-regulation items ultimately reflect teacher preference to adhere to traditional, teacher-focused practices that are within the educator's comfort zone. Considering this point, we should not be surprised as teacher concerns related to questioning one's own knowledge and skills was earlier explored as a potential barrier (Clawson, 1999; Williamson & Blackburn, 2010.) Teachers with higher levels of self-efficacy tend to be more successful in the classroom (Gibson et al., 1984; Bandura, 1993; Rosenholtz, 1989) so stepping outside of one's comfort zone is difficult. It is also the case that maintaining the status quo is perceived as safer and as less difficult than accepting change (Greenberg et al., 2000). In order to facilitate the development of 21st Century Skills, teachers may need to change their priorities in the classroom and reconsider the value of digital literacy skills. We do not view student self-regulatory behaviors to be unimportant nor do we argue that

these skills are to be less desired. However, if teachers are expected to change, administrators at the building and district level will need to change as well. In the following section, we explore recommendations for teachers and administrators.

Implications and Recommendations

We discovered quantitative and qualitative evidence to support an interrelationship between an integrated curriculum and 21st Century Skills. Teachers who frequently implement planning and assessment practices associated with the integrated curriculum are more likely to greatly value 21st Century Skills. Our research revealed that while certain skills are more important than others to teachers, overall these skills are highly valued as no single item from this section of the survey earned a median response lower than "very important." For this reason, we view the implications of this study to reveal the need for greater emphasis on adoption of the integrated curriculum. This will require a restructuring of not only the traditional organization of high school scheduling, it will require a shift in the beliefs about what school ought to look like. However, if we continue to view schools as responsible agents for preparing students to be successful in the 21st century, it is essential that we adopt a curricular method that will assist teachers as they plan, instruct and assess student learning.

Although we did not come across any literature that attempted to establish the integrated curriculum as an ideal method for the development of 21st Century Skills, there are examples of features of the integrated curriculum being implemented with the explicit purpose of improving student development of these skills at the secondary level. Two examples in particular lead us to believe that further research on the interrelationship between the integrated curriculum and 21st Century Skills is needed. First, in August

2016, Finland updated the country's new core curriculum to incorporate "transversal competencies and work across school subjects" (Finnish National Agency for Education, 2016). The justification for this update to the country-wide educational expectations is "to meet the challenges of the future" and describes allowing students the ability to work with several teachers during periods of "phenomenon-based project studies" (Finnish National Agency for Education, 2016). The second is the College Board's Advanced Placement Capstone program. The two-year-long program includes two courses, AP Seminar and AP Research, in which students choose projects, perform collaborative research, and work with teachers across disciplines (College Board, 2017). While neither of these specifically cite "integrated curriculum" as their method, each promote all three key features of the integrated curriculum that were established in our conceptual framework. Therefore, research on the success of these programs is recommended. Special attention should be given to the curricular practices in place and the consistent support of these practices to ensure sustainable implementation.

We view our research and results to provide some justification for the integrated curriculum as an ideal method for the teaching and learning of 21st Century Skills; however, further research is needed, especially in the area of demonstrated student success. We originally intended to study this through the review of College-Work Readiness Assessment (CWRA+) data, but assessing the development of 21st Century Skills is not practiced in most schools; and unlike mandated tests, scores for these assessments, when given, are not shared publicly. Before we can expect schools to choose an assessment of these skills, however, an evaluation of the CWRA+ and

assessments like it to determine valid and reliable measurement of the development of

21st Century Skills is a necessary step.

Finally, our research supports the need for improved, focused, and continuous

professional development of teachers. We propose that the first step in this professional

development should focus on transforming perceptions of teachers. The transformation of

perceptions would require time and intentional planning on the part of administrators who

hope to implement the integrated curriculum. Challenging schema of teachers with

mindsets fixed on barriers outside of their control has been successful in shifting the self-

efficacy of teachers (Timperly & Robinson, 2001). Our interviewees spoke at length

about barriers related to high-stakes testing and reported little if any integrated curricular

planning taking place. However, the school administrator, A2, stated that she estimated

cross-curricular, real world connections taking place 60% of the time within her school.

She also revealed that while the End of Course (EOC) exams did have their place in the

educational landscape, the results of these assessment were not the "end all, be all" of

teaching and learning in School C. This reveals not only a need for challenging the

schema of teachers' perceptions of barriers (Timperly et al., 2001), but also a need for

improved communication among faculty and administration. Both of these could be

achieved through improved professional development provided in the school.

Summary

In this chapter, we reviewed our study of the interrelationship between the

integrated curriculum and 21st Century Skills. We discussed how the literature supported

our conceptual framework and findings. We also established how our research and

findings filled gaps in the current literature by identifying this interrelationship from the

perspective and practices of teachers that had yet to be explored. We have determined that if curricular change is to happen, professional development ought to be a focus and teachers' perspectives should be central to the process.

Based upon our findings, we have identified topics for future research which include an evaluation of current educational programs utilizing the integrated curriculum; as well as an evaluation of current assessments that claim to measure the development of 21st Century Skills. We also recommended that school administrators hoping to improve the development of 21st Century Skills in their students through use of the integrated curriculum should focus on improved, consistent professional development beginning with challenging teacher perspectives related to barriers. There is a growing educational environment that is conducive to the implementation of the integrated curriculum as the focus of 21st Century Skills-based instruction increases. We hope that this research may encourage educators to seize the moment and begin implementing the key features of the integrated curriculum so that students can be successful in future endeavors which will require 21st Century Skills.

References

Adler, M., & Flihan, S. (1997). *The interdisciplinary continuum: Reconciling theory, research, and practice* (Report Series No. 2.36). Albany, NY: Center on English Learning and Achievement.

Allen, I. E., & Seaman, C. A. (2007). Likert scales and data analyses. *Quality progress*, *40*(7), 64.

Allington, R. L., & Cunningham, P. M. (2006). *Schools that work: Where all children read and write* (3rd ed.). New York: Pearson.

APA. (n.d.). Retrieved December 8, 2015, from

http://www.apa.org/pi/aids/resources/education/self-efficacy.aspx

Applebee, A.N., Adler, M., & Flihan, S. (2007). Interdisciplinary curricula in middle and high school classrooms: Case studies of approaches to curriculum and instruction. American E*ducational Research Journal*, 44(4), 1002-1039.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational psychologist*, *28*(2), 117-148.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).

Baker, W.D., & Daumer, E. (2015). Designing interdisciplinary instruction: Exploring disciplinary and conceptual differences as a resource. *Pedagogies: An International Journal*, 10(1), 38-53.

Beane, J. (1991). The middle school: The natural home of integrated curriculum. *Educational Leadership*, 49(2), 9-13.

Beane, J. A. (1997) *Curriculum integration: Designing the core of democratic education*. New York: Teachers College Press.

Barnett, B. (2013). Teacherpreneurs: A bold brand of teacher leadership for 21st-century teaching and learning. *Science,340*(6130), 309. doi:10.1126/science.1230580

Berry, A., & Van Driel, J. H. (2013). Teaching about teaching science: Aims, strategies, and backgrounds of science teacher educators. *Journal of Teacher Education*, *64*(2), 117-128.

Bishop, R., & Berryman, M. (2009). The Te Kotahitanga effective teaching profile. *Research Information for Teachers*, 2, 27–34.

Boostrom, R. (1997, March). Unsafe spaces: Reflections on a specimen of educational jargon. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago.

Bullock, P., Park, V., Snow, J., & Rodriguez, E. (2002). Redefining interdisciplinary curriculum: A journey of collaboration and change in secondary teacher education. *Interchange*, 33(2), 159-182.

Calabrese, R. L. (2002). *The leadership assignment: Creating change*. Boston: Allyn & Bacon.

Clawson, J. G. (1999). *Level three leadership: Getting below the surface.* Upper Saddle River, NJ: Prentice Hall.

College Board. (2017). *AP capstone overview*. Retrieved from https://advancesinap.collegeboard.org/ap-capstone

Cuban, L. (2011). *Teacher Resistance and Reform Failure*. [Web log]. Retrieved from

>   https://larrycuban.wordpress.com/2011/04/30/teacher-resistance-and-reform-

>   failure/

Cuban, L. (2014). *Inside the black box of classroom practice: Change without reform in

>   American education*. Cambridge, MA: Harvard Education Press.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of

>   Teacher Education*, *57*(3), 300-314. Retrieved from http://edpolicy.stanford.edu.

Davenport, T. (2005). *Thinking for a living: How to get better performance and results

>   from knowledge workers*. Boston, Mass.: Harvard Business School Press.

Deans for Impact (2015). The science of learning. Austin, TX: Deans for Impact.

>   Retrieved from https://deansforimpact.org/resources/the-science-of-learning/

Dede, C. (2010). Comparing frameworks for 21st Century Skills. *21st Century Skills:

>   Rethinking how students learn*, *20*, 51-76.

Doyle, L., Brady, A. M., & Byrne, G. (2009). An overview of mixed methods research.

>   *Journal of Research in Nursing*, *14*(2), 175-185.

Draghicescu, L.M., Gorghiu, G., Gorghiu, L. M., & Petrescu, A. M. (2013). Pleading for

>   an integrated curriculum. *Journal of Science and Arts*, 22(1), 89-95.

Drake, S. M. (1998). *Creating integrated curriculum: Proven ways to increase student

>   learning*. Thousand Oaks, CA: Corwin Press.

Drake, S. M., & Burns, R. C. (2004). *Meeting standards through integrated curriculum*.

>   Alexandria, VA: ASCD.

Duke, D. (2004). *The challenges of educational change.* Boston: Pearson Education.

Ellis, A. K., & Fouts, J. T. (1997). Research on educational interventions. *Eye on Education*, 29-34.

Erstad, O., Eickelmann, B., & Eichhorn, K. (2015). Preparing teachers for schooling in the digital age: A meta-perspective on existing strategies and future challenges. *Education and Information Technologies*, *20*(4), 641-654.

Faulkner, J., & Latham, G. (2016). Adventurous lives: Teacher qualities for 21st century learning. *Australian Journal of Teacher Education, 41(4)*, 137-150.

Fisser, P., & Thijs, A. (2015). Integration of 21st Century Skills into the curriculum of primary and secondary education. Conference paper. National Institute for Curriculum Development the Netherlands.

Finnish National Agency for Education. (2016). *Subject teaching in Finnish schools is not being abolished.* Retrieved from http://www.oph.fi/english/current_issues/101/0/subject_teaching_in_finnish_sch ools_is_not_being_abolished

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-development inquiry. *American Psychologist, 34*, 906-911.

Fogarty, R. (1991). *The mindful school: How to integrate the curricula*. Palatine, IL: Skylight Publishing, Inc.

Fraser, D. (2000). Curriculum integration: What it is and is not. *Research Information for Teachers*, 3, 34-37.

Fraser, D., & Charteris, C. (1998, October). *What is curriculum integration and why do teachers need to know?* Paper presented at the New Zealand Teacher Education conference, Hamilton.

Fullan, M. (2001). *Leading in a culture of chan*ge. San Francisco: Jossey-Bass.

Gavelek, J. R., Raphael, T. E., Biondo, S. M., & Wang, D. (1999). Integrated Literacy

Instruction: A Review of the Literature.

Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of*

educational psychology, *76*(4), 569.

Glass, G. V., & Welner, K. G. (2011). Online K-12 Schooling in the US: Uncertain

Private Ventures in Need of Public Regulation. *National Education Policy*

Center.

Glatthorn, A. A., Boschee, F., & Whitehead, B. M. (2009). Curriculum leadership:

Strategies for development and implementation. Sage.

Golsby- Smith, S. (2013). Singing from the same song sheet: The flexible thinker and the

curriculum in the 21st century. English in Education, 47(1), 66-78.

Greenberg, J., & Baron, R. A. (2000). *Behavior in organizations* (7th ed.). Upper

Saddle River, NJ: Prentice Hall.

Greenlaw, J. (2015). Deconstructing the metanarrative of the 21st Century Skills

movement. Educational Philosophy and Theory, 47(9), 894-903.

Gregory, G., & Kaufeldt, M. (2015). The Motivated Brain: Improving Student Attention,

Engagement, and Perseverance. ASCD.

Guskey, T. (2000). *Evaluating professional development*. Thousand Oaks, Calif.: Corwin

Press.

Hargreaves, A., & Fink, D. (2006). *Sustainable leadership*. San Francisco, Calif.: Jossey-

Bass.

Heifetz, R. A., & Linsky, M. (2002). *Leadership on the line: Staying alive*

through the dangers of leading. Boston: Harvard Business School Press.

Humphreys, A., Post, T., Ellis, A. (1981). *Interdisciplinary methods: A thematic approach*. Santa Monica, CA: Goodyear Publishing Company.

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

Kirschner, P. A., & van Merriënboer, J. J. (2013). Do learners really know best? Urban legends in education. *Educational psychologist*, *48*(3), 169-183.

Knight, J. (2009). What can we do about teacher resistance. *Phi Delta Kappan*, *90*(7), 508-513.

Landow, G. (2006). Hypertext 3.0: Critical theory and new media in an era of globalization. Baltimore, MD: The Johns Hopkins University Press.

Lee, H. W., Lim, K. Y., & Grabowski, B. L. (2010). Improving self-regulation, learning strategy use, and achievement with metacognitive feedback. *Educational Technology Research and Development*, *58*(6), 629-648.

Mathews, B., & Cleary, P. (1993). *The integrated curriculum in use: Practical ideas for planning and assessment*. Auckland: Ashton Scholastic.

Mathison, S., & Freeman, M. (1998). The Logic of Interdisciplinary Studies. Report Series 2.33.

McCaffrey, J. R., Lockwood, D. F., Koretz, D. M., & Hamilton, L. S. (2003). *Evaluating value added models for teacher accountability* [Monograph]. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/pubs/monographs/2004/RAND_MG158.pdf

Missouri Department of Elementary and Secondary Education. (2013). *Missouri*

    Teaching Standards. Retrieved from

    https://dese.mo.gov/sites/default/files/TeacherStandards.pdf

Nanna, M. J., & Moses, M. S. (2007). The testing culture and the persistence of high

    stakes testing reforms. *Education and Culture*, *23*(1), 55-72.

Nichols, S. L., & Berliner, D. C. (2008). Why has high-stakes testing so easily slipped

    into contemporary American life? *Phi Delta Kappan*, 672-676.

Niglas, K. (2007). Introducing the quantitative-qualitative continuum: an alternative view

    on teaching research methods courses. *Learning and teaching of research*

    methods at university, 185-203.

Paine, T. (2004). *Common sense*. Broadview Press. (p. 45).

Palmer, P. (2007). *The courage to teach*. (10th ed.). San Francisco: Jossey-Bass.

Pearlman, B. (2010). Designing new learning environments to support 21st Century

    Skills. *21st Century Skills: Rethinking how students learn*, 116-147.

Petroelje Stolle, E., & Frambaugh-Kritzer, C. (2014). Putting professionalism back into

    teaching: Secondary preservice and in-service teachers engaging in

    interdisciplinary unit planning. *Action in Teacher Education*, 36(1), 61-75.

Postman, N. (1993). Technopoly: The Surrender of Culture to Technology. New York,

    NY: Random House.

Pring, R. (2006). Curriculum integration. Journal of Philosophy of Education, 5(2),

    170−200.

Robbins, S. (2000). *Essentials of organizational behavior* (6th ed.). Upper Saddle River,

    NJ: Prentice Hall.

Roberts, C. M. (2010). The dissertation journey: A practical and comprehensive guide to
planning, writing, and defending your dissertation. Corwin Press.

Rosenholtz, S. (1989). Teacher's workplace: The social organization of schools.
NewYork: Longman.

Rotherham, A. J., & Willingham, D. T. (2010). "21st-Century" Skills. *American
Educator*, 17.

Rowan, B., Correnti, R., & Miller, R. J. (2002). What large-scale survey research tells us
about teacher effects on student achievement: Insights from the Prospects study
of elementary schools. *Teachers College Record, 104*, 1525-1567.

Shoemaker, B. (1989). Integrative education: A curriculum for the twenty-first century.
Oregon School Study Council, 33(2), 5.

Schmoker, M. (1999). Results: *The key to continuous school improvement*. Alexandria,
VA: Association for Supervision and Curriculum Development.

Strauss, V. (2015). Report: Big education firms spend millions lobbying for pro-testing
policies. *The Washington Post*. Retrieved from
https://www.washingtonpost.com/news/answer-sheet/wp/2015/03/30/report-big-
education-firms-spend-millions-lobbying-for-pro-testing-policies/

Supovitz, J. (2010). Is High Stakes Testing Working. *Retrieved February*, *3*, 2015.
*Cornman, S. Q. (2015). Revenues and Expenditures for Public Elementary and
Secondary Education: School Year 2011–12 (Fiscal Year 2012)(NCES 2014-
301). Washington, DC: National Center for Education Statistics, US Department
of Education.source)*

Tanner, D. (1989). A brief historical perspective of the struggle for an integrative

    curriculum. *Educational Horizons, 68*(1), 7-11.

Timperly, H.S., & Robinson, V. (2001). Achieving school improvement through

    challenging and changing teachers' schema. *Journal of Educational Change, 2(4)*,

    281-300.

Trilling, B., & Fadel, C. (2009). 21st Century Skills: Learning for life in our times. San

    Francisco, CA: Jossy-Bass.

Vars, G. F. (1991). Integrated curriculum in historical perspective. *Abstracts*

    International, 20,1830-1831.

Vars, G. F., & Beane, J. A. (2000). *Integrative Curriculum in a Standards-Based World*.

    ERIC Digest.

Voogt, J., & Roblin, N. P. (2012). A Comparative Analysis of International Frameworks

    for 21stCentury Competences: Implications for National Curriculum Policies.

    Journal Of Curriculum Studies, 44(3), 299-321.

Whyte, B., & Strang, P. (1998, October). *Implications of curriculum integration for*

    professional development of teachers. Paper presented at the New Zealand

    Teacher Education conference, Hamilton.

Williamson, R., & Blackburn, B. R. (2010). Dealing with resistance to change. *Principal*

    Leadership, *10*(7), 73-75.

Willingham, D. (2006). How knowledge helps. *American Educator*. Retrieved from

    www.aft.org/periodical/american-educator/spring-2006/how-knowledge-helps

Wright, S. P., Horn, S. P., & Sanders, W. L. (1997). Teachers and classroom context

      effects on student achievement: Implications for teacher evaluation. *Journal of*

      Personnel Evaluation in Education, 11, 57-67.

Zimmerman, J. (2006). Factors that relate to educators' use of the Baldrige Framework

      [Electronic version]. *Continuous Improvement Monitor, 2*(3).

Appendix A

21st Century Skills and Descriptors

Skill	Descriptors
Creativity	• Creation, analysis and elaboration of new ideas. • Inquisitive and entrepreneurial attitude. • Think outside of the box through creative techniques • Take risks and see errors as opportunities for learning.
Critical thinking	• Formulate and reason opinions based upon verified arguments. • Interpret, analyze and synthesize information. • Formulate meaningful questions based upon identified gaps in information. • Metacognitive practices. • Openness to alternative perspectives.
Problem-solving skills	• Recognize problems and form solutions. • Generate, analyze and apply strategies to solve unfamiliar problems. • Create patterns and models to lead to justifiable decisions.
Communication	• Transfer and receive messages effectively and efficiently. • Goal-oriented exchange of information through a variety of mediums. • Employ best communication strategies for the given content and audience.
Collaboration	• Joint realization of a group goal. • Recognize and establish individual roles. • Ask for, give and receive help with a positive and open attitude. • Respect cultural differences and heterogeneous groups. • Negotiate within a group to arrive at a common consensus.

Digital Literacy	• ICT (basic) skills
	   o Understand basic computer functions.
	   o Working knowledge of standard hardware and office applications.
	   o Interaction with software of various devices.
	   o Internet use, security and privacy.
	• Computational thinking
	   o Problem solving using appropriate ICT techniques and tools.
	   o Organization, representation and analysis of data to find solutions.

Digital Literacy (continued)	• Media and information literacy
	   o Knowledge, skills and attitudes to identify influence of media.
	   o Participation with and metacognitive reflection of personal media use.
	   o Search, select, process, use and present relevant information.

Social and cultural skills	• Learn, work and live with people of different ethnic, cultural and social backgrounds. • Respectful communication and behaviors with recognition of various codes of conduct. • Show empathy and concern for others. • Self-awareness as an individual and as a citizen in society.
Self-regulation	• Goal-oriented and appropriate behavior. • Ability to prioritize, monitor, evaluate and reflect on personal behaviors. • Recognize short and long term consequences of personal choices and actions. • Take responsibility for personal choices and actions. • Self-awareness concerning the development of competence.

Appendix B

Survey

Page 1 of the survey

Informed Consent:

Thank you for participating in this survey. Your feedback is important. Please answer the following questions as honestly as possible. These questions concern the interrelationship between the integrated curriculum and the development of 21st Century Skills.

The purpose of this survey is to help the researchers identify and explore practices in curricular planning, as well as attitudes and opinions related to integrated curriculum and 21st Century Skills.

At the end of the survey you may choose to enter your name and email address to indicate that you may be contacted for a follow up interview and/or to be entered into a drawing for a $50 Visa gift card that is limited to the survey participants at your school. We do not anticipate that taking this survey will contain any risk or inconvenience to you. Furthermore, your participation is strictly voluntary and you may withdraw your participation at any time without penalty.

All information collected will be used only for our research and will be kept confidential. There will be no connection to you specifically in the results or in future publication of the results. Once the study is completed, we would be happy to share the results with you if you desire. In the meantime, if you have any questions please contact:

Kim Mohr & Rob Welker: kmckh6@umsl.edu, 3146234802

Or our faculty advisor

Dr. Jacquelyn LewisHarris: lewisharrisj@umsl.edu, 3145166023

By starting the survey you are verifying that you have read the description of the study, and that you agree to participate. You also understand that your participation in this study is strictly voluntary.

Page 2 of the survey

Tell us about yourself: Please answer the following questions about your professional experience.

- How long have you been teaching? (Options: 1-4 years; 5-9 years; 10-14 years; 15+ years)
- What is your current title including content area and grade level? (Free response)

Page 3 of the survey

Tell us about your practice: Please use the scales and checkboxes to identify your level of agreement with the following statements.

(Likert-type scale: 1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Always)

- I consider current events while planning my units.
- I consider real world applications of skills that students are to learn while planning my units.
- I consider real world applications of content that students are to learn while planning my units.
- My students are assessed on their ability to apply what they have learned in a real world setting.
- I consider content outside of my specified discipline while planning my units.
- My students are assessed on their ability to make connections among content areas.
- Disciplinary boundaries are maintained at my school.
- I consider student interest while unit planning.
- I consider student perspective during individual evaluations.
- My students have a voice in unit planning.
- I provide designated class time for discussion with students to help plan the direction of upcoming units.
- Students in my school contribute to the discussion of planning new courses.

(Likert type scale: 1= Not probable, 2= Somewhat improbable, 3= Neutral, 4= Somewhat probable, 5= Very probable)

- My students are aware of the usefulness of my content outside of school.

(Check boxes)

I collaborate with colleagues WITHIN my specified discipline on (select all that apply)

- Planning vertical curriculum
- Planning/correlating thematic units
- Creating new courses
- Determining essential knowledge and skills
- Developing common assessments
- Sharing best practices
- Other (Participants are asked to provide a description if selected).

I collaborate with colleagues OUTSIDE of my specified discipline on (select all that apply)
- Planning vertical curriculum
- Planning/correlating thematic units
- Creating new courses
- Determining essential knowledge and skills
- Developing common assessments
- Sharing best practices
- Other (Participants are asked to provide a description if selected).

Page 4 of the survey

In your professional opinion...: Please select the responses that most closely align with your professional opinion, and share your ideas on the following.

(Likerttype scale: 1= Strongly disagree, 2= Disagree, 3= Neither agree nor disagree, 4= Agree 5= Strongly agree)
- Some disciplines are more important than others.
- (Free Response Option) "Some disciplines are more important than others." Please elaborate on your response.

(Likerttype scale:1= Not important, 2= Low importance, 3= Medium importance, 4= High importance, 5= Essential)

● How important are the following skills?

- Creation, analysis and elaboration of new ideas.
- Inquisitive and entrepreneurial attitude.
- Thinking outside of the box through creative techniques.
- Taking risks and seeing errors as opportunities for learning.
- Formulate and reason opinions based upon verified arguments.
- Interpret, analyze and synthesize information.
- Formulate meaningful questions based upon identified gaps in information.
- Metacognitive practices
- Openness to alternative perspectives.
- Recognized problems and form solutions.
- Generate, analyze and apply strategies to solve unfamiliar problems.
- Create patterns and models to lead to justifiable decisions.
- Transfer and receive messages effectively and efficiently.
- Goal Oriented exchange of information through a variety of mediums.
- Employ best communication strategies for the given content and audience.
- Joint realization of a group goal.
- Recognize and establish individual roles.
- Ask for, give and receive help with a positive and open attitude.
- Respect differences of heterogeneous groups.
- Negotiate within a group to arrive at a common consensus.
- Understand basic computer functions.
- Practice working knowledge of standard hardware and office applications. Interact with software of various devices.
- Practice internet use, security and privacy.
- Problem solving through appropriate ICT techniques and tools.
- Organization, representations and analysis of data to find solutions. Knowledge, skills, and attitudes to identify influence of media.

- Participation with and metacognitive reflection of personal media use.
- Search, select, process, use and present relevant information.
- Learn, work and live with people of different ethnic, cultural, and social backgrounds.
- Respectful communication and behaviors with recognition of various codes of conduct.
- Self-Awareness as an individual and as a citizen in society.
- Goal Oriented and appropriate behavior.
- Ability to prioritize, monitor, evaluate and reflect upon personal behaviors. Recognize short and long term consequences of personal choices and actions. Take responsibility for personal choices and actions.
- Self-Awareness concerning the development of competence.

Page 5 of the survey

Please enter your name and email address alongside each option if you are willing to...

Be contacted to participate in a follow-up interview:

Be entered in a drawing (limited to participants at your school) for a $50 Visa gift card:

Appendix C

Invitation to School Principals

Dear (Administrator):

I hope that this email finds you well at this busy time in the semester! My name is Kim Mohr, and I am a doctoral candidate studying curriculum and instruction at the University of Missouri- St. Louis. My dissertation partner, Rob Welker, and I are **requesting your permission to invite teachers from your school to participate in a survey and interviews** as a part of our research into best curricular practices for the development of 21st Century Skills. Specifically, we are hoping to explore the interrelationship between the integrated curriculum and 21st Century Skills development.

Your school was chosen to be included as it was listed as a participant in the College-Work Readiness Assessment (CWRA+.) Inasmuch, **we are also requesting that your school share summary reports of CWRA+ testing results** *from the earliest date administered through the 2015-2016 school year***. In your consideration of our request, please keep in mind:

- **No students will be involved in surveys or interviews.**
- Surveys and interviews will take place during the first semester of the 2016-2017 school year.
- Participation of teachers in both the survey and interview is 100% voluntary and participants may decline consent at any time without penalty.
- **All teacher participants will remain anonymous in our reporting.**
- One teacher-participant in the survey from each school will be selected at random to receive a $50 Visa gift card as an incentive.
- **Schools that choose to participate and share available summary data will be kept confidential.** Each school will only be identified in our report using randomly assigned letters (Ex. School A, School B, etc.)

We are in the process of receiving approval from the IRB of the College of Education at UM- St. Louis. The informed consent that has been shared with that committee is attached to this email and may be found at **our website**.

Thank you in advance for your consideration! Your permission to invite teachers, *and sharing of summary data*** will be invaluable to answering our research questions as we hope to add to the literature concerning best practices in the planning and implementation of curricula related to 21st Century Skills.

I look forward to hearing back from you!

Warm regards,

Kim Mohr

**Italicized portions of the above were not included in the second round of invitation emails.

Appendix D

Interview Questions

1. What is your definition of an integrated curriculum?
2. Do you consider the real world applications of skills that students are learning while planning your units?
3. How do you assess your student's ability to apply what they have learned in a real world setting?
4. Do you consider content outside your specified discipline while planning units. If so how often? If not why?
5. Is student interest a consideration when unit planning? If yes please explain why? If no please explain why not?
6. Please describe the collaboration process within your specific discipline?
7. Please describe the collaboration process with colleagues outside of your specific discipline?
8. Do you think that some disciplines are considered more important than others? Please explain your answer.
9. Of the 21st century skills that you are aware of, which ones are the most important for students to learn, and why?