Pre-Service Teachers' Experiences With Curriculum Integration: A Qualitative Study

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Abstract

Curriculum integration is being adopted worldwide in the 21st century. However, in-service and pre-service teachers often receive little or no training in curriculum integration upon graduating university, which often makes them ill-prepared to implement this strategy. Moreover, because the term lacks universality and clarity in both theory and implementation, it has become a source of confusion and anxiety for educators. This qualitative study examined the amount of curriculum integration training received by teacher candidates at a medium-sized university in Southern Ontario in completing their final year of schooling. The study's primary purpose was to determine the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. The study also sought to identify the knowledge base of curriculum integration that these teachers had acquired during their time in university. Convenience sampling was used to select students in their final year of teacher certification. Twenty-five participants from both concurrent and consecutive teacher education programs were recruited and the data were collected solely through face-to-face interviews. General thematic analysis was used to analyze and identify patterns within the qualitative data. The results indicated that many teachers did not have a sufficient knowledge base of curriculum integration upon graduation, and did not appear to be familiar with the various methods of curriculum integration. Finally, the study found that teacher candidates felt uncomfortable integrating curricula in their own classrooms. Results are discussed in terms of teacher training, teaching practice, and further research.

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CHAPTER ONE: INTRODUCTION TO THE STUDY

This qualitative analysis examined the training opportunities teacher candidates received at a medium-sized university located in southern Ontario with respect to integrated curriculum approaches. Teacher candidates were interviewed during their certification year to determine their knowledge base and comfort level with curriculum integration. The participants were asked several open-ended discussion questions in order to explore this topic.

Integrated curriculum is a fairly ambiguous term that is not easily defined or understood (Brough, 2012; Hurley, 2001). It represents a curriculum approach that utilizes meaningful connections between the content and skills that are covered in various disciplines (Consortium of National Arts Education Associations, 2002; Costley, 2015; Hardman, 2009; Hinde, 2005; Merritt, 2008; Zhou & Kim, 2010). The goal of integrated curriculum is to create connections among the disciplines to develop a more powerful understanding of a fundamental concern, idea, person, or occurrence (Hinde, 2005; Hooper, Greene, & Sample, 2014; Richard & Bennett, 2011). The degree of curriculum integration between the disciplines can be substantial or slight, and integration occurs in a multitude of forms. Moreover, this approach to curriculum is usually student-centered (Brough, 2012; MacMath, Roberts, Wallace, & Chi, 2010; Wong, 2013). Ideally, the students are at the heart of their own learning because the curriculum is developed with a focus on their personal interests and concerns. Curriculum integration focuses on broad learning goals and skills rather than the segmented curriculum standards outlined in the formal curriculum documents created by various jurisdictions across the world (Kim & Aktan, 2014; Merritt, 2008). It encourages personal relevance, collaboration, citizenship,

inquiry, problem-solving, social interactions, hands-on learning, and responding to societal concerns and needs (Araki-Metcalfe, 2012; Beane, 1997; Klein, 2014; Parsons, & Beauchamp, 2012; Richard & Bennett, 2011; Vars & Beane, 2001). Finally, curriculum integration can be applied to all grade levels and content areas (Merritt, 2008).

Various studies have reported the benefits of curriculum integration on student achievement. Research has found that students are much more motivated to learn in an integrated curriculum (Doyle, Huie Hofstetter, Kendig, & Strick, 2014; Finn & McInnis, 2014; Kakas & Green, 2010; MacMath et al., 2010; Tsinopoulos et al., 2014). Similarly, studies also suggest that curriculum integration increases student engagement (Finn & McInnis, 2014; Trent & Riley, 2009; Zwirn & Fusco, 2009). In addition, other studies have found that students using an integrated curriculum outperform their counterparts academically (Finn & McInnis, 2014; Tong, Irby, Lara-Alecio, & Koch, 2014; Yoon, Dyehouse, Lucietto, Diefes-Dux, & Capobianco, 2014; Zwirn & Fusco, 2009). Engin and Uygun (2009) in turn suggest that curriculum integration can effectively develop student values. Finally, many scholars believe that integrating the arts and humanities into other subjects is an effective teaching method that provides students with a new learning outlet (Araki-Metcalfe, 2012; Brewer, 2002; Doyle et al., 2014; Gullatt, 2008; Kakas & Green, 2010; Marshall, 2005; Nathan, 2008; Trent & Riley, 2009; Vitulli, Santoli, & Fresne, 2013; Winner, 2001; Zwirn & Fusco, 2009).

The purpose of this study was to determine the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. The study also

sought to identify the knowledge base of curriculum integration that these teachers had acquired during their university career. Overall, the study intended to determine the degree to which pre-service teachers felt knowledgeable and comfortable with the topic of curriculum integration**.**

Background to the Problem

Some scholars suggest that education reflects the benefits and interests of academic elites and those with high-socioeconomic statuses (Beane, 1997). For many years now, these parties have dictated exactly what information our youth need to know—with an emphasis on the classics such as literature and math (Hinde, 2005; Russell-Bowie, 2009; Taber, 2014). Noddings (2003) defines this knowledge as "inferred needs" which are imposed by society, institutions, or guardians (as cited in Richards & Kroeger, 2012, p. 14). Traditional education then places that esteemed knowledge into neat little boxes called disciplines or subjects (Gehrke, 1998; Mei, 2009; Merritt, 2008). These disciplines are treated as separate bodies of knowledge, with no relationship or significance to one another (Gehrke, 1998; Hardman, 2009; Jacobs, 1991; Klein, 2004; Mei, 2009; Merritt, 2008; Wraga, 2009). This traditional discipline-based curriculum design has dominated schools for decades (Merritt, 2008; Hooper, Greene, & Sample, 2014; Taber, 2014; Park, 2008). It was intended to produce assembly-line workers to complete tasks correctly; they had no use for analyzing, questioning or creating (Willis, 2011). Yet, in the 21st century, more and more knowledge is becoming multifaceted and connected (Costley, 2015; Drake, Savage, & Reid, 2015; Mei, 2009; Parsons & Beauchamp, 2012). There is an increase in global interdependence, pace and complexity, technological advances, bodies of knowledge, interconnectedness amongst complex

systems, and a need for employees to draw from a variety of fields to solve problems (Drake, 2012; Lake, 2000; Russell-Bowie, 2009; Stein, Connell, & Gardner, 2008; Steiner & Posch, 2006).

Accordingly, there is a significant disconnect between the traditional curriculum and the needs of society (Hardman, 2009; Kim & Atkan, 2014; Mei, 2009; Park, 2008; Taber, 2014). Modern day issues are often multidisciplinary in nature and thus need to be considered from multiple disciplines and viewpoints (Crisan, 2014; Drake et al., 2015; Kim & Atkan, 2014; Klein, 2014; Mei, 2009; Wraga, 1997; Zhou & Kim, 2010). Knowledge and life are not disconnected, stagnant, one-dimensional phenomena; they are constantly accumulating, networking, and evolving (Drake, 2012; Mei, 2009; Park, 2008; Richards & Kroeger, 2012; Taber, 2014; Zhou & Kim, 2010). Oddleifson (1995) suggested that students are also integrated people, and as a result, curriculum and pedagogy should adapt to their complexities rather than attempt to force two-dimensional schooling environments on them (as cited in Vitulli et al., 2013, p. 45; see also Lipka et al., 1998). Students are learning much of the same information, in the same way their parents did a decade before (Park, 2008; Taber, 2014). David Orr said it best when he proclaimed that the problems we face today "cannot be solved by the same kind of education that helped create the problems" (as cited in Mei, 2009, p. 40). Accordingly, many suggest that there is a need to integrate curricula in the 21st century (Costley, 2015; Drake, 2012; Drake et al., 2015; Hooper et al., 2014; Pang & Good, 2000; Parsons & Beauchamp, 2012).

Taylor and Parsons (2011) suggest that in this increasingly global world, students need to be taught differently in order to be productive citizens in the 21st century. Klem

and Connell (2004) and Willms (2003) project approximately 25- 60% of U.S. students are detached from school (as cited in Lee, 2014, p. 177). In 2013, a Gallup poll of over 600,000 American students found that only 55% of students are engaged, 28% are not, and only 17% are actively engaged (Gallup, 2014, p. 13). Students complain that the content they are learning is irrelevant to their lives outside of school, which results in a lack of understanding, problem behaviour, disengagement, and academic challenges and drop out (Lake, 2000; Lee, 2014; Park, 2008; Wraga, 1997). In the U.S., 4th graders' literacy assignments were found to score among the highest in the world (National Council of Teachers of English, 2011). Yet, those same students are among the lowest once they get to the 10th grade (National Council of Teachers of English, 2011). The National Council of Teachers of English (2011) suggests that this decline is due to the amplified discipline-based approach that students encounter once they reach high school.

A traditional discipline based curriculum supports the notion that knowledge is inherently distinctive in various disciplines (Moje, 2008). Disciplines are viewed as subcultures of the school, with distinct ways of doing, knowing, and believing (Moje, 2008). However, traditional discipline-based education has been described as a narrow, flat, limiting, predictable, artificial, standardized, lifeless, and congested curriculum (Klein, 2004; Merritt, 2008; Parsons & Beauchamp, 2012; Wraga, 1997; Zhou & Kim, 2010) that hinders creative expression, innovation, and plurality (Doyle et al., 2014). It breaks the world into little fragmented pieces (Hooper et al., 2014; Kim & Aktan, 2014; Parsons & Beauchamp, 2012) and dejects the unity of knowledge and learning (Mei, 2009; Taber, 2014). Students are reduced to passive receivers of information who cannot actively engage in their learning because what and how they will learn is already decided

for them (Drake, Reid, & Kolohon, 2014; Drake et al., 2015; Mei, 2009; Steiner & Posch, 2006). After a traditional lesson, students may understand what experts believe about a topic but they will not know why or how the experts came to these conclusions (Stein et al., 2008). Thus, students are having troubles transferring knowledge to problems outside of each discipline because they are treated as such separate entities (Leiman, Ankor, & Milne, 2015; Thomas, 2013).

Teachers today also face serious pressures in regards to high-stakes testing scores, content overload, and accountability, especially since the No Child Left Behind Act in 2001 (Drake, 2012; Fingon, 2011; Russell-Bowie, 2009; Parsons & Beauchamp, 2012; Vars & Beane, 2001; Wraga, 2009; Zhbanova, Rule, Montgomery, & Nielsen, 2010). Marzano (2003) calculated that teachers are expected to teach an average of 14 different content areas with 200 standards and over 3,000 benchmarks in them every school year (as cited in Hinde, 2005, p. 105). Teachers would need over 15,000 hours to cover all of the standardized content, yet they only have 9,000 hours of instruction time in a typical school year (as cited in Hinde, 2005, p. 105). Thus, it is impossible to cover all of the material expected of them (Hinde, 2005; Lake, 2000). Not to mention, teachers also face large classes, increased bodies of knowledge, and even mandates from drug awareness, to bus safety, to cyber bullying, and racism (Drake, 2012; Lake, 2000).

What is more, teachers are judged by student results as the test scores are viewed as quantifiers of student progress and suitable teaching practices (Hayes, 2010). The Obama administration even promised to attribute teacher pay to student scores on these high-stakes tests, which would have only made matters worse for teachers (Pinar, 2010). Several studies have found that student-centered strategies are being abandoned as a

result of preparing for these tests (Brand & Triplett, 2012; Hayes, 2010). Thus, students do not genuinely learn the content, but memorize it in order to pass a test (Drake, 2012; Tsinopoulos et al., 2014; Wraga, 2009). In the U.K., the Rose Review was commissioned in 2009 to confront anxieties about the National Curriculum as it was deemed too content heavy (Hayes, 2010; Parker, Heywood, & Jolley, 2012). The review endorsed integrated curriculums stating that it imitates natural brain functioning among other things (Parker et al., 2012). Integration may also be a means for teachers to better cover subject areas and content standards (Hinde, 2005).

Traditional education focuses on the correct answer rather than the intended outcome or skill such as critical thinking or becoming a productive citizen (Ciecierski & Bintz, 2015; Doyle et al., 2014; Lipka et al., 1998). It is argued that content or right answers are not enough; students need to develop a love of learning, motivation to learn, the habit of inquiry, creative thinking, reasoning, et cetera (Richards & Kroeger, 2012; Willis, 2011). Today, students will need a skill set that goes over and above the existing mandated curriculum standards that are evaluated on high-stakes tests (Drake, 2012; Gresnigt, Taconis, van Keulen, Gravemeijer, & Baartman, 2014; Zhou & Kim, 2010).

The Mid-continent Research for Education and Learning examined 116 national standards documents in 14 content areas and identified a set of life skills that can be embedded in an integrated curriculum (Vars & Beane, 2001). They revealed that students need life skills that are not covered within the disciplines such as global awareness, financial literacy, technological proficiency, and cultural awareness and acceptance (as cited in Parsons & Beauchamp, 2012, p. 162; see also Russell & Burton, 2000; Vega, 2013; Willis, 2011). Moreover, students need to learn how to apply new knowledge to

various situations and acquire universal skills such as evaluation, communication, research, team work, analysis, critical thinking, synthesis, and leadership to thrive in our future world (Frazee & Rudnitski, 1995; Parsons & Beauchamp, 2012; Russell-Bowie, 2009). Furthermore, Vars and Beane (2001) discuss how the National Study of School Evaluation and the Alliance for Curriculum Reform identified common learning goals across various disciplines; these goals were skills such as thinking and reasoning, interpersonal skills, and expanding and integrating knowledge.

The current curriculum is expected to encompass all knowledge that is essential for the next generation of students to learn (Drake et al., 2015; Lipka et al., 1998). However, Lipka et al. (1998) suggest that such educational predictions may cause psychological scars, which hinder future learning. Consequently, the traditional approach to education is condemned for not reflecting the democratic society we live in (Brough, 2012; Bullock, Park, Snow, & Rodriguez, 2002; Wood, 2005). Students should be involved in classroom decisions such as the content they would like to cover (Brough, 2012; Wood, 2005). Article 12 of the United Nations Convention on the Rights of the Child (1989) states that children have the right to express their opinions openly in all matters affecting them and to have these opinions taken into consideration (as cited in Brough, 2012, p. 345). The New Zealand curriculum document actually mandates many democratic principles such as student decision-making, participation, and empowerment (Brough, 2012).

Valuable information and authentic learning is often neglected in a discipline-based curriculum approach (Halverson et al., 2014; Merritt, 2008; Russell-Bowie, 2009; Russell & Burton, 2000). The California Arts Council suggested that national movements

over the past decade such as The No Child Left Behind Act promoted the classics such as English and math at the expense of other subjects such as art and physical education (as cited in Doyle et al., 2014, p. 2; see also Hinde, 2005; Russell-Bowie, 2009). Yet, not only subjects but also skills such as collaborative work and inquiry are sacrificed for the passive memorization of information (Willis, 2011). Thus, integrative curriculum is said to promote teachable moments that traditionally slip through the rigid discipline cracks (Beane, 1997). The White House Task Force on Childhood Obesity (2010) even created a narrative focused on combatting childhood obesity that suggested the incorporation of physical education into many other disciplines (as cited in Finn & McInnis, 2014; see also Hovland et al., 2013).

The need for curriculum integration is not a new endeavour; in the 1960s, popular pedagogic journals reported the need for more individualized work and coherence between disciplines (Hultén, 2013). Over 20 years ago, Grady (1994) accused discipline-based curriculum of being outdated and called for a restructuring of education (as cited in Parsons & Beauchamp, 2012, p. 158). The Association for Supervision and Curriculum Development conducted a survey around the same time that rated interdisciplinary curriculums as one of the highest priorities in education (Jacobs, 1991). In recent years, integrated curriculums are being adapted in countless countries around the world, yet in a piecemeal fashion (Chrysostomou, 2004; Fenwick, Minty, & Priestley, 2013; Johnston, 2011; Klein, 2014; Lake, 2000; Park, 2008; Parker, 2012).

Many studies have found curriculum integration to influence student achievement. Studies suggest that curriculum integration increases student engagement (Finn & McInnis, 2014; Trent & Riley, 2009; Zwirn & Fusco, 2009). Yoon et al. (2014), Zwirn

and Fusco (2009), Tong et al. (2014), and Finn and McInnis (2014) have found that students using an integrated curriculum excel academically when compared to control groups. Many academics also believe that integrating the arts and humanities into other subjects is an efficient teaching technique that needs to be explored further (Araki-Metcalfe, 2012; Brewer, 2002; Doyle et al., 2014; Gullatt, 2008; Kakas, 2010; Marshall, 2005; Nathan, 2008; Trent & Riley, 2009; Vitulli et al., 2013; Winner, 2001; Zwirn & Fusco, 2009).

Many associations such as the National Research Council, the American Association for the Advancement of Science, the directives of the European Commission, the National Middle School Association, National Association for Core Curriculum, and the National Council of Teachers and Mathematics have recommended the use of integrated curriculums (Crisan, 2014; Drake, 2012; Zhou & Kim, 2010). Scotland's new Curriculum for Excellence (Fenwick et al., 2013), the University of Utah's teacher programs (Hardman, 2009), Taiwan's curriculum for grades 1-9 (Richards & Kroeger, 2012), England's National Primary Strategy (Hayes, 2010), the national curriculum for Northern Ireland and New Zealand (Parker et al., 2012), Romania's 1st- and 2nd-grade curricula (Crisan, 2014), secondary schools (Merritt, 2008) and the English Language Arts Common Core (Doyle et al., 2014) in California, as well as curriculum efforts in Korea (Park, 2008) and Japan (De Araujo et al., 2013) are all examples of modern adaptations of curriculum integration.

In February 2014 the teachers of Trinidad and Tobago were required to adapt a new integrated curriculum (Yvonne, 2015). Much like Canada, the major concerns of the curriculum were advancing literacy and numeracy skills (Yvonne, 2015). These teachers

were also required to complete training practices in order to better adapt to the new curriculum organization (Yvonne, 2015). Recently, Finland has also undergone a major curriculum reform toward integration (Garner, 2015). The Finnish education system "is highly decentralized, giving Finland's 320 municipalities significant amount of freedom to arrange schooling according to the local circumstances" (Garner, 2015, para. 3). The integration reform began in 2012 and has now been implemented in the educational system since 2016 (Garner, 2015). Several core curriculum documents have been drawn up concurrently with students involved in the planning and assessment of their own learning (Garner, 2015).

The Government of Jamaica has also reformed its curriculum from grades 1-3 towards an integrated approach (Jamaica Ministry of Education and Culture [JMEC], 1999). They have made significant changes in physical infrastructure, evaluation, revision of curriculum standards, and even teacher training programs (JMEC, 1999). The ministry has termed it the Primary Education Improvement Programme (PEIP II) which seeks to better prepare students for the challenges they will face in the 21st century (JMEC, 1999). Several years ago, independent schools in South Korea began using an "open classroom" method of teaching which required teachers to integrate multiple disciplines into projects (National Center on Education and the Economy [NCEE], 2017). The success of this method resulted in public schools all over South Korea adapting the same integrated curricula approach along with government support (NCCE, 2017).

In Canada, Prince Edward Island (PEI) has come out with a government document for kindergarten educators (PEI Ministry of Education, 2008). This document includes the philosophy behind curriculum integration, integration practices, as well as

assessment and evaluation suggestions (PEI Ministry of Education, 2008). There are also resources offered by the Ontario Government to assist teachers in curriculum integration. For example, they provide a document that offers important educational guidelines when integrating curricula as well as helpful tips (Drake & Reid, 2010a). This same document also offers an example of an integrated unit so that educators can see first-hand how to make connections between expectations (Drake & Reid, 2010a). Another Ontario document available online provides educators with a step by step method of planning an integrated unit (Drake & Reid, 2010b).

Moreover, in the 2015/16 school year, British Columbia introduced a draft redesigned integrated curriculum from Kindergarten to grade nine (British Columbia Ministry of Education [BCME], 2016). This curriculum commenced in September of 2016 but new reporting and assessment practices are still being developed (BCME, 2016). Additionally, in 2008, a group of 45 intermediate teachers from 15 schools in the Bluewater District School Board decided to work collaboratively to create interdisciplinary units (Drake & Racknor, 2017). Their reactions to the implementation of the units were recorded and their journey towards integration continues.

Thus, integrated curriculums are being adapted in many countries throughout the world; however, there is still a lack of definition and integration training among teachers (Chávez, Tarr, Grouws, & Soria, 2015; Chrysostomou, 2004; Drake et al., 2015; Harrell, 2010; Hurley, 2001; Kim & Aktan, 2014; Zhou & Kim, 2010). Interdisciplinary education has been inadequately theorized, and student work within such paradigms has been insufficiently assessed, partly because there is not yet consensus on what constitutes measurable interdisciplinary outcomes (Gresnigt et al., 2014; Thomas, 2013). Thus,

teachers are uncertain of the term “curriculum integration” and how to integrate effectively, so they tend to avoid the approach altogether (Park, 2008; Parker et al., 2012).

Scholars and educators alike have advocated for more instruction in regards to integrating disciplines, however conceptual and empirical work to guide these efforts is limited (Hooper et al., 2014). As mentioned above, the Ontario Ministry of Education does offer guidelines for interdisciplinary lessons and units, however teachers need to be efficiently trained in integration in order to use these tools effectively and feel comfortable doing so. The Ontario curriculum documents themselves remain discipline based. Scholars claim than an integrated curriculum will not be successfully adapted worldwide unless curriculum developers emphasize and explain how specific connections can be made between the disciplines (Roman, 2014; Zhbanova et al., 2010).

Statement of the Problem Context

Students in the 21st century are being taught the same content, in the same fashion as their parents before them (Taber, 2014). Students are disengaged, unmotivated to learn, struggling with concepts, and in some cases dropping out because they are being forced to conform to an educational system that is outdated (Lake, 2000; Lee, 2014; Park, 2008; Wraga, 1997). Teachers are also suffering in the current educational system as they face accountability pressures, heavy content loads, lack of time, high-stakes testing liability, problem behaviour, overpopulated class sizes, and mandates (Drake, 2012; Lake, 2000; Lee, 2014; Wraga, 2009).

Numerous scholars propose integrating the curriculum as a means to reduce these issues and better equip students for their futures (Drake, 2012; Drake et al., 2015; Lake, 2000; Lee, 2014; Parsons & Beauchamp, 2012; Wraga, 2009). Nonetheless, given the

countless explanations of what constitutes curriculum integration, they highly recommend that a clear, concise definition of the term be established in order for successful integration (Drake et al., 2015; Hurley, 2001; Wong, 2013; Zhou & Kim, 2010). Terms such as cross-disciplinary, interdisciplinary, multidisciplinary, or transdisciplinary are used interchangeably to refer to curriculum integration (Drake et al., 2015). Thus, academic discussions around integrated curriculum are often fragmented because discussions on the topic are nearly impossible to unite. Curriculum integration also takes many forms such as fusion, project-based learning, syntegration, thematic units, and others (Drake et al., 2015). Thus, the terms used to describe the various modes of integration are innumerable and need to be narrowed down as well.

Teachers and scholars alike have advocated for more guidance in integrating curriculum. The Ontario Ministry of Education offers guidelines for interdisciplinary lessons and units, however the Ontario curriculum documents remain discipline based and not all teachers feel knowledgeable enough on the topic(s) to use them. In order for teachers to integrate curriculum, they must be given significant preparation time (Crisan, 2014; Fenwick et al., 2013; Russell & Burton, 2000; Wong, 2013). Curriculum integration requires some teachers to reevaluate their views on learning, thinking, content, student engagement, and sometimes collaborative planning with their colleagues (Consortium of National Arts Education Associations, 2002). Nonetheless, it has been found that many teachers are willing to adapt this approach but most do not feel prepared for implementation (Fenwick et al., 2013; Park, 2008; Parker et al., 2012; Wong, 2013; Wood, 2001). An integrated curriculum cannot be successfully adapted worldwide unless curriculum developers emphasize and lay out specific connections that can be made

between the disciplines or transform the curriculum to integrated all together (Brand & Triplett, 2012; De Araujo et al., 2013; Pang & Good, 2000; Roman, 2014; Zhbanova et al., 2010).

I argue that since integrated curriculums are now being recognized as an effective pedagogical approach, teachers need to be provided with assistance in order to implement it. Ideally, the Ontario curriculum itself would be transformed into an integrated model. Yet, to begin with, having a clear definition of the term "curriculum integration" and all of the specific methods within it will help teachers better understand and utilize the approach. In addition, educators today are expected to successfully integrate the curriculum without being formally trained to do so. If teachers were educated on the subject and prepared to integrate, they would be more inclined to adapt the integrated curriculum strategy in their own classrooms, which in turn would help alleviate many of the teacher and student challenges faced today. Teacher education programs need to provide educators with efficient training, resources, and support in order for curriculum integration and meaningful learning to take place.

Purpose of the Study

Today, curriculum integration is widely advocated for all around the globe as a means to better engage students and prepare them for the 21st century **(**Marshall, 2005; Mei, 2009; Parsons & Beauchamp, 2012; Steiner & Posch, 2006). Yet, the term curriculum integration lacks universality and clarity in both theory and implementation because it is very context specific and its definition is unclear (Hayes, 2010; Russell-Bowie, 20009; Zhou & Kim, 2010). Moreover, both in-service and pre-service teachers lack training in curriculum integration which makes them ill-prepared for implementation

(Parker et al., 2012; Wong, 2013; Zhou & Kim, 2010). Thus, since teachers are uncertain of the term curriculum integration and how to do so effectively, they avoid adapting the approach (Park, 2008; Parker, Heywood, & Jolley, 2012).

The purpose of this qualitative study was to determine the degree of curriculum integration training received by teacher candidates. It is important to note that the integration of technology within the classroom was not considered in this study. I agree with Drake et al. (2015) who suggest that technology offers educators tools to enhance curriculum delivery but is not a discipline in itself.

Research Questions

This qualitative study sought to answer three primary research questions:

1. Do teacher candidates have a base knowledge of curriculum integration?
2. Do teacher candidates feel comfortable to integrate curricula after completing their teacher certification year?
3. How much training have teacher candidates received in curriculum integration during their university career?

Rationale for the Study

The rationale for this research is first and foremost to draw attention to the integrative curriculum approach. If a sufficient amount of knowledge and training is provided to educators in order to help support curriculum integration, even more educational reforms will take place. For centuries, education has wavered between both student- and teacher-centered pedagogical approaches. In the 21st century, curriculum integration holds promise for more student-centered learning, yet teachers need better training for momentum. As more research is conducted on the topic, we come closer to

finding a definitive explanation for integrative curriculum and the various modes it entails which can also help teachers in the implementation process.

The primary purpose of this study was to determine the degree of curriculum integration training teacher candidates had received during their university career, as well as their comfort levels in implementing curriculum integration upon graduation. The study also revealed the knowledge base of curriculum integration that these teachers had acquired during their university career. Overall, the study intended to determine the degree to which teacher graduates felt knowledgeable and prepared on the topic of curriculum integration.

As a graduate of teacher's college myself, I have my own personal experiences with curriculum integration. I was a student in the concurrent education program at my university, so I had education classes throughout my five years of schooling. Many of these classes focused on curriculum integration as did my first-year Master's courses. Thus, when deciding on a topic of study, I realized that curriculum integration, although thoroughly covered in my classes, was one area of the field that I was still unsure about. I felt as though the definition of the term was too broad and the steps to integrate very complicated. I also didn't understand why so much time was spent covering the topic when the curriculum itself didn't reflect this pedagogy at all. I wanted to know what experiences other teacher candidates' have had with curriculum integration to compare it with my own.

Theoretical Framework

The framework for the current study was based on the educational theory of John Dewey, which led to the so-called progressive education movement. Progressive

education encourages interest-driven, natural student learning without the separation of topics or disciplines (Frazee & Rudnitski, 1995). Dewey believed that students learn best by their interactions in the world and that these interactions cannot be restricted to specific disciplines (Drăghicescu, Gorghiu, Gorghiu, & Petrescu, 2013; Harrell, 2010; Wraga, 1997). Dewey (1902) also suggested that the curriculum meet the child on his or her own terms and thus should be determined in part by the interests of the child (Dewey, 1902). He believed that students learn best though relevant, purposeful experiences in the real world whether it be within the classroom or the community, and not only in traditional context areas (Harrell, 2010; Hogan, & Bertram, 2013; Wraga, 1997; Yun, 2000; Zwirn & Fusco, 2009). Dewey (1902) believed that learning should rely on exploration that is guided by the scientific method so that the child's experiences are educational rather than haphazard (see also Drăghicescu et al., 2013).

Thus, Dewey criticized the traditional discipline-based education as fragmenting knowledge and separating it from experience (Drăghicescu et al., 2013; Frazee & Rudnitski, 1995; Mei, 2009). Progressive education endorses student-centered learning, the teacher as facilitator, collaborative learning, holistic education, experiential learning, self-imposed discipline, and schools as sites for social reform (Kretchmar, 2008; Parsons & Beauchamp, 2012). Proponents of progressive education believe it is teachers' duty to educate students about democracy and the injustices in the world, which is impossible without exceeding the disciplines (Bullock et al., 2002).

Importance of the Study

Students are disengaged, unmotivated to learn, struggling with concepts, and dropping out at alarming rates because they are being forced to conform to an educational

system that is outdated (Lake, 2000; Lee, 2014; Park, 2008; Wraga, 1997). Thus, the need for instructional practices that motivate and engage student learning is of utmost importance. This qualitative study has the potential to determine whether teacher knowledge and training is effectively preparing them for curriculum integration upon graduation. If the study indicates that the teacher candidates are insufficiently educated and trained in curriculum integration, this will bring awareness and hopefully improvements to curriculum and teacher education programs/ resources in the future.

Current studies point to the need for educating teachers on why and how to adapt the integrated curriculum approach (Brand & Triplett, 2012; De Araujo et al., 2013; Pang & Good, 2000). It is found that teachers would like to try this pedagogical approach but do not feel prepared for the task (Fenwick et al., 2013; Park, 2008; Parker et al., 2012; Wong, 2013; Wood, 2001). Thus, this study also set out to advocate for the Ministry of Education to ideally revamp the Ontario curriculum to an integrated model rather than disciplinary. Yet, more realistically, the study encourages the Ministry of Education to create standardized documents on integrative studies that provide teachers with specific integration topics, examples, and resources.

Accordingly, this study ultimately has the potential to add to the body of evidence that supports integrated curricula and teacher training and encourages future implementation policies all around the world.

Participants

The qualitative study examined a group of 25 teacher candidates enrolled in their teacher certification year at a mid-sized university located in Ontario. Interviews took place during the teacher candidates' first teacher certification year in university. The

student participants consisted of 20 females and five males under the age of 30. Some participants were enrolled in the concurrent program and the remainder were in the consecutive program, with varying undergrad classes.

Table 1: Participant Demographics

Participant	*Gender*	*Program*
Participant 1	Male	Concurrent Education Intermediate/ Senior
Participant 2	Male	Concurrent Education Junior/ Intermediate
Participant 3	Female	Concurrent Education Junior/ Intermediate
Participant 4	Male	Concurrent Education Primary/ Junior
Participant 5	Male	Consecutive Education Primary/ Junior
Participant 6	Female	Concurrent Education Junior/ Intermediate
Participant 7	Female	Concurrent Education Not Disclosed
Participant 8	Female	Consecutive Education Not Disclosed
Participant 9	Female	Consecutive Education Intermediate/ Senior
Participant 10	Female	Concurrent Education Not disclosed
Participant 11	Female	Concurrent Education Junior/ Intermediate
Participant 12	Female	Concurrent Education Primary/ Junior
Participant 13	Female	Concurrent Education Not Disclosed
Participant 14	Female	Consecutive Education Intermediate/ Senior
Participant 15	Female	Consecutive Education Not Disclosed
Participant 16	Female	Concurrent Education Not Disclosed
Participant 17	Female	Not Disclosed Not Disclosed
Participant 18	Female	Concurrent Education Primary/ Junior
Participant 19	Female	Concurrent Education Not Disclosed
Participant 20	Female	Concurrent Education Intermediate/ Senior
Participant 21	Female	Concurrent Education Intermediate/ Senior

Participant 22	Female	Consecutive Education Primary/ Junior
Participant 23	Male	Not Disclosed Junior/ Intermediate
Participant 24	Female	Concurrent Education Not Disclosed
Participant 25	Female	Concurrent Education Not Disclosed

Role of the Researcher

The methodology of this study was guided by general thematic analysis, as themes were found throughout participant explanations in order to make reports about their experiences. As the researcher, I was a key instrument in the description and analysis of the teacher candidate experiences. I was also responsible for recruiting the teacher candidates, conducting the interviews, and then transcribing the responses.

Scope and Limitations of the Study

This was an interpretive qualitative study of a group of 25 teacher candidates at one particular university in southern Ontario. As a consequence, the results of this investigation are not generalizable outside of this specific context. The results may be very different at other universities or if this study was conducted at another time in the same place. Additionally, the participants, while representative of the teacher candidates at the institution, primarily came from white, middle-class backgrounds. A more diverse sample of teacher candidates may have responded to the questions differently.

Outline of the Remainder of the Document

This thesis paper is separated into five chapters. It begins with Chapter 1's outline of the research problem. Next, Chapter 2 places the present study within the context of a theoretical framework through an overview of empirical research on the topic. This chapter establishes this study within the main theoretical framework of John Dewey's

progressive education movement. The historical theoretical origins of integrated curriculum are then explored in relation to core curriculum as well as project-based, thematic, and inquiry based learning. Then, the chapter discusses neurological deliberations as well as the innumerable modes of integration, and then considers the claims of both supporters and critics of curriculum integration as well as suggestions for implementation. Finally, the last section of Chapter 2 presents empirical intervention studies pertaining to curriculum integration.

Chapter 3 outlines a justification for choosing the qualitative study approach along with a detailed description of the methods used in this study. This chapter then asserts the research purpose, qualitative research approach, and restates the research questions. Next, the research methodology, research design, procedure, participants, data collection and data analysis are discussed. Finally, ethical considerations are examined along with the potential research bias and study limitations.

Chapter 4 contains the analysis of the data sources of this study: the teacher candidate interview responses. The analysis of the data is presented in the form of four major themes that emerged from the teacher candidate answers: Definitions, Buy-In, Experiences with Integration, and Preparedness.

Chapter 5 comprises a research summary and a discussion of the results found from the current qualitative study. The chapter also presents an overview of the theoretical and practical implications of the results along with the limitations of the research and recommendations for future research.

Definition of Terms

The following terms are defined in order to assist in better understanding the

discussion surrounding the study. It is important to note here that the definitions of integrated curriculum and progressive education are purposely broad as they evade one distinct universal description.

- Core Curriculum: a distinct set of courses that are considered to provide students with the foundation they need for success in their future endeavours, educational or not (Loeser, 2015). The courses that comprise this foundation historically fluctuate (Loeser, 2015).
- Correlation / Fusion / Infusion / Nested Curriculum: an integration approach where instruction from one discipline is essentially nested within another discipline and focused around themes (Gehrke, 1998; Gresnigt et al., 2014; Hinde, 2005; Vars, 1991). It essentially uses elements of one discipline to enrich the learning of another.
- Discipline-Based / Disciplinary / Isolated / Cellular / Fragmented / Traditional Curriculum: represents the traditional approach to teaching and learning in which the subjects or disciplines remain separate and distinct areas of study with distinct time blocks dedicated to each (Fogarty, 1991; Gresnigt et al., 2014; Hayes, 2010, p. 382; Jacobs, 1989).
- Inquiry-Based Learning: an educational philosophy that requires students to use methods and practices that are grounded in the scientific method of constructing knowledge (Pedaste et al., 2015); formulating hypotheses, choosing suitable methods, and then testing them by conducting experiments and/or formulating observations (Pedaste et al., 2015).
- Integrated Curriculum: a curriculum approach that utilizes meaningful

connections between the content and skills that are covered in various disciplines (Zhou & Kim, 2010); the goal is to create connections among the disciplines in order to develop a more powerful understanding of a fundamental concern, idea, person, or occurrence (Hinde, 2005).

- Integration Continuum: represents the extent of curriculum integration that begins with traditional discipline-based education, then works through various models that integrate a few disciplines, and ends with models that focus on integration of knowledge within the learner (Drake et al., 2015; Harrell, 2010; Khalil & Kibble, 2014; Park, 2008; Zhou & Kim, 2010).
- Interdisciplinary Curriculum: an integration approach that incorporates knowledge and skills from two or more disciplines to examine a more integrated/complex central theme, problem, topic, experience or issue that cannot be clarified from just one sole discipline (Burton, 2000; Drăghicescu et al., 2013; Frazee & Rudnitski, 1995; Hayes, 2010; Jacobs, 1989; Lake, 2000; Nicolescu, 2014; Parker et al., 2012; Steiner & Posch, 2006).
- Learner-Initiated Integration / Self-Regulated Learning: an integration approach where students are made responsible for their own metacognitive, motivational, and behavioural learning outcomes (Steiner & Posch, 2006). They utilize their own feelings, thoughts, actions, and beliefs to achieve their learning goals (Steiner & Posch, 2006). They also make their own connections between the subject areas by applying previous knowledge to new contexts (Burton, 2001; Chrysostomou, 2004; Drake et al., 2015; Parsons & Beauchamp, 2012).
- Multidisciplinary Curriculum: an integration approach most similar to the

disciplinary model as it requires studying a research topic or real-life problem from a variety of discipline perspectives at once with no discernible attempt to integrate them (Beane, 1997; Brough, 2012; Burton, 2000; Drăghicescu et al., 2013; Drake et al., 2015; Gresnigt et al., 2014; Jacobs, 1989; Kim & Aktan, 2014; Nicolescu, 2014). The disciplines remain separate and/or juxtaposed as they essentially rotate around a shared topic (Brough, 2012; Fenwick et al., 2013).

- Problem-Based Learning (PBL): a subtype of project-based approaches (Halverson et al., 2014). It is learning that occurs when examining, explaining, and resolving, meaningful problems that are relevant to student lives (Halverson et al., 2014). It differs from project-based approaches in that it does not involve a culminating event to the same degree, and the students often do not actually play a role in executing the resolution of the issue in the real world (Halverson et al., 2014).
- Progressive Education: a student-centered educational philosophy that promotes curricula determined by students, teacher as facilitator, collaboration, problem solving, experiential learning, holistic education, curricula integration and social reform (Kretchmar, 2008).
- Project-Based Learning: a student-centered approach to teaching and learning in which assignments or a set of assignments are product-oriented and long-term (Fischer, 2015). The final products take a variety of forms such as a written paper, a song, video, oral presentation, visual, or even a combination (Fischer, 2015).
- Thematic Approach: a pedagogical approach in which educators select a theme and then use the various disciplines to investigate and gain knowledge on that

theme (Burton, 2001; Chrysostomou, 2004; Merritt, 2008; Wood, 2001).

- Transdisciplinary Curriculum: an integration approach that begins with a real world problem and then knowledge from the disciplines are brought in as needed in order to resolve the problem (Drăghicescu et al., 2013; Drake et al., 2015; Gresnigt et al., 2014; Jacobs, 1989).
- Social Constructivism: an educational philosophy which emphasizes the construction of knowledge within social contexts (Brand & Triplett, 2012).

Chapter Summary

Chapter 1 described how the educational system is currently hindering student achievement and putting insurmountable pressures on teachers. Accordingly, this chapter stresses the need for an education revolution to assist student learning and alleviate teacher anxieties. It illustrates that policies and countries all around the world are turning to the integrated curriculum approach as a solution. However, it was argued that teachers are reluctant to adapt this approach because integrated curriculums are ambiguous and teacher training is scarce.

The chapter indicated that the purpose of this study was to determine the knowledge base of the teacher candidates in regards to curriculum integration as well as their comfort level in implementing it upon graduation. Overall, the study intended to determine the degree to which teacher graduates felt knowledgeable and prepared on the topic of curriculum integration. If the study indicates that the teacher candidates are insufficiently educated and trained on the subject of integration, this will bring awareness and hopefully improvements to curriculum and teacher education programs/resources in the future.

The theoretical framework was primarily established within Dewey's progressive education philosophy alongside project-based learning, core curriculum, thematic leaning, and inquiry-based learning. Moreover, it was explained that this qualitative study was limited to one group of teacher candidates in teachers college at a medium sized university in Southern Ontario.

The objectives of this study were to examine the comfort levels and knowledge base of teacher candidates in regards to curriculum integration as well as the likelihood of adaptation upon graduating from university.

CHAPTER TWO: REVIEW OF THE LITERATURE

This chapter examines the origins of the integrated curriculum approach to education. Curriculum integration comprises one main theoretical framework that was established centuries ago. This literature review begins by establishing the theoretical framework of this study and then broadens its' scope to other theoretical associations of integrated curriculum.

To begin with, the initial section establishes this qualitative research within a particular theoretical framework distinguished by Dewey's progressive-education model, which outlined the primary research questions and narrowed the parameters of the study. The subsequent portions of the theoretical framework section identify and explain the theories aforementioned and their contributions to integrated curricula discussions.

Next, the literature review places integrated curriculum within its' historical origins of project-based learning, core-curriculum, thematic, and inquiry-based learning. These educational philosophies are explored from their deep historical roots to their contributions in classroom settings. The subsequent section is dedicated to integrating curricula in the 21st century. Firstly, the countless modes of integration are established and explained. Then, as this theory is one of the most debated topics of today, both supporters and critics' opinions are discussed in the following sections along with suggestions for integration. Finally, the last section provides an overview of the empirical intervention studies regarding integrated curriculum approaches. It is important to note that I did not approach this literature review in complete neutrality. I personally feel that the integrated curriculum approach is an effective means to revolutionize education and make learning enjoyable and relevant for students.

Literature Establishing the Theoretical Framework

The proposed framework for the current study was primarily based on John Dewey's educational philosophy widely acknowledged as progressive education. He criticized traditional discipline-based education for fragmenting knowledge and separating it from experience (Frazee & Rudnitski, 1995; Drăghicescu et al., 2013; Mei, 2009). Thus, progressive education encourages interest driven, natural student learning without the separation of topics or disciplines (Frazee & Rudnitski, 1995). Dewey believed that students learn best by their interactions in the world and that these interactions should not be constrained by disciplines (Drăghicescu et al., 2013; Harrell, 2010; Wraga, 1997). Moreover, progressive education advocates that it is a teachers' duty to educate students about the injustices in the world, which is problematic without exceeding the disciplines (Bullock et al., 2002).

Progressive Education: Dewey, Parker, Montessori, and Bean

Integrated curriculum has a long affiliation with the progressive movement in education (Beane, 1997; Brough, 2012; Vars, 1991; Wong, 2013; Wrightstone, 1935). Contemporary progressivism is mainly associated with education, however as a philosophy, it was a part of a much greater social movement (Kretchmar, 2008). The Progressive Era took place between 1880 and 1930, when many Western countries were moving from an agrarian society to an industrial one (Kretchmar, 2008). Reformers attempted to fix what they perceived as the evils of industrialism (Kretchmar, 2008). They looked toward education as a means to eradicate some of society's' problems at the time (Kretchmar, 2008).

Since the commencement of compulsory education in the late-19th century,

attitudes toward education have fluctuated between two extremes commonly identified as traditionalism and progressivism (Kretchmar, 2008). Hence, progressive education was viewed as a break from or solution for traditional educational approaches (Buri, 2014; Chrysostomou, 2004). Students were historically expected to receive knowledge from their teacher, and then memorize and recite these facts until they were "learned" (Buri, 2014; Wraga, 1997). Pedagogical practices were teacher-centered and followed a standardized curriculum that emphasized classical subjects such as English, science, math, and history (Buri, 2014; Frazee & Rudnitski, 1995; Wraga, 1997). Teachers often transmitted knowledge to students through the use of textbooks and lectures (Buri, 2014). The conventional approach favoured disciplinarian classroom management strategies and relied heavily on evaluation approaches that measured students' recall as evidence of learning (Kretchmar, 2008).

Since the development of progressive education in the 1930s, public opinion has wavered in regards to traditional and progressive reforms (Drake et al., 2014; Howlett, 2013). Many political shifts occurred in the 1960s and 1970s (e.g., the civil rights movement) that renewed public interest in the progressive movement (Kretchmar, 2008). Educators reevaluated their traditional pedagogical methods at this time and became recommitted to matters of access and equity (Kretchmar, 2008). Schooling was perceived by students as monotonous and unresponsive to their wants and needs, not just as students but as human beings (Howlett, 2013). Thus, it was during this time that schools began to experiment with integrated curriculum (Kretchmar, 2008). However, the blossoming of progressive education was short lived as from 1975 to 1993 educational systems switched back to a traditional approach in order to increase teacher

accountability (Drake et al., 2014).

In 1983, the educational report titled “A Nation at Risk” came to the American forefront (Kretchmar, 2008). The report recognized a decline in academic achievement levels as measured by standardized tests, both in comparison to other nations and historically (Kretchmar, 2008). Thus, this American report was seen as a revolutionary discovery that proved the ineffectiveness of progressive practices. As a result, America adapted a “back to the basics” educational philosophy that was imitated by other countries all across the world, including Canada (Buri, 2014). There was a national push for the formation of curriculum standards, the expansion of high-stakes testing and augmented accountability for both schools and teachers (Kretchmar, 2008). Thus, progressive education was the dominant approach to education at various times throughout the twentieth century, but was highly questioned due to the “back to basics” push (Kretchmar, 2008). In the 1980s the California State Report (1987) and the Carnegie Report (1989) resolved that the traditional discipline-based system was failing to motivate student learning (Drake et al., 2015). Moreover, many educators were and still are reluctant to follow the traditionalist pedagogy, so it is uncertain whether progressive or traditionalist education will prevail in the next century. The Progressive Education Association was founded in 1919 and brought attention to educational concerns that eventually led to launching the Eight-Year Study in the 1930s (Lipka et al., 1998).

Throughout history, many theorists have contributed to the development of progressive education. However, John Dewey in particular remains the most closely associated with the construction of the movement (Hinde, 2005; Kretchmar, 2008; Park, 2008). Dewey pointed out an undeniable disconnect between the child and curriculum

and suggested that the curriculum meet the child on his or her own terms (Dewey, 1902). That is, he believed that the curriculum should be determined in part by the interests of the child (Dewey, 1902). He encouraged educators to take the holistic needs and interests of the student into consideration when planning lessons (Hogan, & Bertram, 2013; Post, Ellis, Humphreys, & Buggey, 1997; Wraga, 1997). Moreover, Dewey saw education as a means of helping students to better live in the present rather than preparing them for the future (Hogan, & Bertram, 2013; Wraga, 1997). He believed that students learn best though relevant, purposeful experiences in the real world whether it be within the classroom or in the community, and not just in traditional context areas (Harrell, 2010; Hogan, & Bertram, 2013; Wraga, 1997; Yun, 2000; Zwirn & Fusco, 2009). Consequently, Dewey placed significant emphasis on collaborative learning (Hogan, & Bertram, 2013). He felt as though collaborative learning (with peers, the community, etc.) was a means to develop social skills, which he deemed essential in a democratic culture (Brough, 2012; Kretchmar, 2008; Parsons & Beauchamp, 2012). Accordingly, Dewey stressed the importance of schooling as preparation for democratic citizenship (Brough, 2012; Bullock et al., 2002; Kretchmar, 2008; Parsons & Beauchamp, 2012).

Although John Dewey is often credited for the establishment of progressive education, he himself dubbed Francis Parker as "the father" of the movement (Hinde, 2005; Kretchmar, 2008). Parker believed in "educating children for intelligent social participation" (Cooke, 2005, p. 158). Accordingly, Dewey may have adapted this holistic approach to education from the emphasis Parker placed on the body, mind, heart, and spirit in learning experiences (Cooke, 2005). Dewey advocated for a curriculum that centered on the development of the whole child (Cooke, 2005). He was openly against

standardization and memorization in education and emphasized the importance of teaching students to question the world around them and to think for themselves (Cooke, 2005). He believed this critical thinking was essential in order to create independent thinking agents rather than passive recipients of information (Cooke, 2005).

Maria Montessori was another educational theorist who is frequently associated with progressive education (Thayer-Bacon, 2012). She founded the "Montessori Method" upon teaching and learning theories that were largely based on her work with special needs students (Thayer-Bacon, 2012). Like Dewey, she felt that schooling should be personalized to the specific individuals' needs and interests (Thayer-Bacon, 2012). Maria believed that learning is intrinsic; that is, the student will acquire new knowledge naturally if he or she is put into an educational environment (Thayer-Bacon, 2012). Hence, she felt that the classroom should include a multitude of readily available learning resources such as games and toys (Thayer-Bacon, 2012). She (just like Dewey) suggested that teachers act as facilitators of learning rather than transmitters of knowledge (Thayer-Bacon, 2012). Thus, "for Dewey and other progressives, schools are not fortresses for knowledge transmission; they are open, welcoming social centers for knowledge generation" (Hogan, & Bertram, 2013, p. 9).

Beane is yet another influential advocate of Dewey and the progressive movement (Brough, 2012; Gehrke, 1998). He believed in social reconstructivism, a movement that aimed to build a more just, and equitable social order (Gehrke, 1998). His studies focused mainly on middle school education, however he recommended three universal goals of schooling (Parsons & Beauchamp, 2012). First, he believed learning should be grounded in general education and real world issues rather than segregated content areas (Brough,

2012; Parsons & Beauchamp, 2012). Second, he believed the aim of school should be to make learning relevant to the students and their interests, not the adults who produced them (Brough, 2012; Parsons & Beauchamp, 2012). Finally, Beane recognized the worth of students by reminding the public that students are human beings too with valuable thoughts and feelings (Parsons & Beauchamp, 2012). Just like anyone else, they need to know and understand their inner selves and the world they are living in (Drake et al., 2015; Parsons & Beauchamp, 2012). Thus, Bean stated that curriculum should address the big questions students have about themselves and/or their environment to foster authentic learning and curriculum integration (Brough, 2012; Drake et al., 2015; Parsons & Beauchamp, 2012). He also believed that when student concerns and questions are organized into social and personal relevance, they cover the majority of standardized curriculum expectations (Drake et al., 2015).

Beane does not call for the elimination of disciplines, but for them to be used as resources to explore student ideas (Drake et al., 2015). He suggests that the curriculum be structured around thought-provoking themes instead of abstract disciplines (Parsons & Beauchamp, 2012). He focuses on two areas of inquiry: (a) What concerns or questions do the students have about themselves, and (b) what concerns or questions do the students have about the world around them (Drake et al., 2014). He believes this will help students attain new knowledge, skills, self-worth, and social abilities (Parsons & Beauchamp, 2012). Furthermore, Beane advocates for using a student-centered approach to foster skills such as communication, research, questioning, problem solving, valuing, computation, and social action (Brough, 2012).

In sum, Dewey's educational philosophy encouraged the need to integrate curricula in the early 20th century (Crisan, 2014). He and Parker insisted that integrating curricula is a fundamental aspect of effective teaching (Hinde, 2005). Dewey suggested that the child learns naturally without separating topics or disciplines, and then when that child goes to school he or she experiences the fragmentation of knowledge (Frazee & Rudnitski, 1995). He believed that students learn best by their experiences in the natural world, and that these experiences cannot be categorized into particular disciplines (Drăghicescu et al., 2013; Harrell, 2010; Wraga, 1997). He suggested that learning is beyond disciplines and that traditional education separates knowledge from experience (Drăghicescu et al., 2013). Progressive education endorses student-centered learning, the teacher as facilitator, collaborative learning, holistic education, experiential learning, self-imposed discipline, and schools as sites for social reform (Kretchmar, 2008; Parsons & Beauchamp, 2012).

Dewey proposed that teachers find content and activities that interest the students which may have nothing to do with the disciplines (Chrysostomou, 2004). Content should be integrated in relation to its real-life relevancy in solving problems (Wraga, 1997). He even suggested that the curriculum be structured around occupations rather than disciplines to make learning quite literally relevant to student futures (Wraga, 1997). Finally, Dewey thought that it was teachers' responsibility to teach about the inequalities and discrimination in the world, which cannot be done without transcending the disciplines (Bullock et al., 2002). Significant research continues to be conducted to determine the effectiveness of these pedagogical practices (such as integrative curriculums) in contemporary education.

Historical Theoretical Origins of Integrated Curriculum

The integrated curriculum approach has a long and ambiguous history. The progressive movement of the 1930s endorsed an educational system that was student-centered, holistic, democratic, and integrated knowledge (Beane, 1997). Accordingly, curriculum integration was an essential component of educational reforms in the late 1950s and the 1960s—largely due to the ideas presented by the progressive movement (Merritt, 2008). Eventually, these ideals were put on the backburner and discipline based curricula reined again (Merritt, 2008). In the 1980s the California State Report (1987) and the Carnegie Report (1989) concluded that the traditional discipline-based system was failing to motivate student learning (Drake et al., 2015). Thus, in the late 1980s, studies and policies called for a focus on the integration of various disciplines within schools in order to revolutionize education (Merritt, 2008). It comprised approaches such as, interdisciplinary curriculum, team teaching, block scheduling, and student activities (Drake et al., 2015).

Then, in the mid 1990s, educational concerns were directed toward teacher accountability, standards-based curriculum, and standardized testing (Drake et al., 2015). The No Child Left Behind Act of 2001 is a clear indicator of this switch back to traditional educational values once again. Today, as we are moving further into the second decade of the 21st century, the integrated curriculum approach has been brought back into the forefront of education (Drake et al., 2015). It is again showing promising results in practice, policies, and research (Drake et al., 2015). Thus, educators and scholars alike are doing all they can to learn more about the value and implementation process that comes with integrating curricula. However, discussions around curriculum

integration are fairly new as it only became broadly implemented in the 20th century despite its long history (Kim & Aktan, 2014).

Historically, integrated curriculum is associated with and influenced by a number of educational philosophies of, and approaches to, education. Thus, the following sections will demonstrate how project-based learning, core curriculum, thematic leaning, and inquiry-based learning offer insight into discussions on the integrated curriculum approach to teaching and learning.

Project- Based Learning

The project method developed out of the progressive movement and constructivist learning beliefs which is largely attributed to John Dewey and William Heard Kilpatrick (Drake et al., 2015; Halverson et al., 2014). Kilpatrick established the project method during the first decades of the 20th century working off of Dewey's progressive philosophy (Hultén, 2013). Project-based learning is a term that comprises several methods of curriculum organization that have similar goals and beliefs about learning (Fischer, 2015). The term refers to a teaching method in which students investigate and respond to an authentic/complex problem or question to gain new knowledge and skills. This approach sometimes requires students to complete assignments or a set of assignments that are product-oriented and long-term (Fischer, 2015). The final products take a variety of forms such as a written paper, a song, video, oral presentation, visual, or even a combination (Fischer, 2015). Other larger-scale products often take the form of school murals, museum exhibits, full plays, or science fairs (Fischer, 2015). Moreover, over the years the project method has evolved into the term project-based learning in the 21st century (Drake et al., 2015).

Project-based learning methods are one of the most globally adopted teaching and learning approaches in the twenty-first century (Khalil & Kibble, 2014). Many scholars view project-based approaches as powerful forms of education (Halverson et al., 2014). Kilpatrick's method relies on completing purposeful projects in a social context because like Dewey, he believed in democracy (Yun, 2000). He believed that purposeful projects inspire meaningful lives because students are accomplishing important tasks (Yun, 2000). It also prepares students for life while simultaneously attributing value to that life (Yun, 2000). Thus, Kilpatrick claims that the project method is concerned with the enrichment of student life rather than the importance of acquiring new knowledge (Yun, 2000).

Project-based learning relies on student-centered inquiry (Drake et al., 2015). The projects commonly join the theoretical with the practical, placing an emphasis on real world application of content (Halverson et al., 2014). This method commonly focuses content on student interests and natural curiosities (Halverson et al., 2014). The topics of study are often generated by class discussions and students are treated as active learners who acquire new knowledge by doing rather than memorizing (Halverson et al., 2014; Yun, 2000). Meaningful questions developed from real-world problems that rely on student collaboration and participation are key characteristics of project-based approaches (Halverson et al., 2014). Student questions drive the learning and then eventually take the form of real-world projects (Halverson et al., 2014). The students tackle an authentic question or problem over an extensive period of time while constructing a final project that has application beyond the school setting (Halverson et al., 2014).

The project method is often used to integrate content from various disciplines (Drake et al., 2014; Khalil & Kibble, 2014; Wraga, 1997). First and foremost, like

progressive education; project-based approaches seek to make learning fun and relevant for students. Thus, the curriculum is comprised of student interests and life experiences rather than standards to be checked off within each discipline. This approach typically integrates a variety of disciplines while investigating a real-world theme, inquiry, or problem (Halverson et al., 2014). Student questions and concerns direct the projects and activities that follow (Halverson et al., 2014). For instance, students may ask why their clothing comes from so far away or why a new landfill is being put in down the street. Moreover, the questions can also be carefully crafted by real-world concerns that the teacher feels hold significant relevance to his or her students (Halverson et al., 2014). An example of this would be how to reduce the amount of garbage produced at one's school (Halverson et al., 2014). Either way, students investigate authentic questions across the disciplines such as geography, economics, mathematics, or art while building language and literacy proficiency and real-world skills (Halverson et al., 2014).

Thus, rather than planning within each discipline, teachers or students choose a project based on student interests and then plan class lessons accordingly (Halverson et al., 2014; Yun, 2000). For example, once an in-depth inquiry focus is determined, a project on global warming could involve creating and presenting a play, producing a newspaper, and/ or even visiting a nature conservatory. This approach commonly involves exploration of a topic, in the form of data collection, learning centers, art projects, scientific investigations, field trips, surveys, visits from local experts, and interviews (Halverson et al., 2014), all of which, are interdisciplinary in nature. However, researchers and educators alike have yet to agree on what project-based approaches consist of or how they should be implemented within a classroom (Halverson et al.,

2014). The Association for Supervision and Curriculum Development introduced a problem-based learning network to collect support and resources for the problem-based form of curriculum integration in K-12 school settings (Gehrke, 1998).

Project-based approaches have been found to have positive effects on student achievement, attitudes towards school, motivation, and engagement (Halverson et al., 2014). Students commonly develop optimistic attitudes toward learning while teachers develop an improved sense of professionalism (Halverson et al., 2014). Since learning is rooted in every-day experiences and concerns, students view their learning as valuable and meaningful (Yun, 2000). Moreover, this approach has been advised as an effective strategy for students with learning difficulties and/or disabilities (Halverson et al., 2014). Some evidence suggests that project-based approaches greatly enhance higher-order thinking skills such as communicating, planning, critical thinking, and problem solving in comparison to the more traditional approaches to teaching and learning (Halverson et al., 2014). Specifically, this approach has been found to make mathematics more enjoyable for students (Halverson et al., 2014). Given that there is a constant universal push for mathematics proficiency, this is a significant benefit/discovery (Halverson et al., 2014). Thus, project-based approaches to curriculum implementation hold promise for student learning across countless disciplines and grade levels (Halverson et al., 2014).

Some critics such as Beane (1997) argue that the project method is a restrictive and incorrect approach to integrating curriculum. He accuses this method of being a means to fit progressive ideas painlessly into the preexisting conservative traditions already in place (Beane, 1997). Other critics of project-based approaches suggest that this method lacks academic thoroughness (Halverson et al., 2014). However, teachers

implement the project-based approach in a countless number of ways across the globe so the approach is still up for debate (Halverson et al., 2014). Moreover, some approaches to problem-based learning are more academically demanding than others (Halverson et al., 2014).

Finally, it is important to note here that problem-based learning (PBL) is a subtype of project-based approaches (Halverson et al., 2014). Problem-based learning is learning that occurs when examining, explaining, and resolving, meaningful problems that are relevant to student lives (Halverson et al., 2014). However, it differs from project-based approaches in that it does not involve a culminating event to the same degree, and the students often do not actually play a role in executing the resolution of the issue in the real world (Halverson et al., 2014).

Core Curriculum

The core curriculum is essentially the precedent to the integrated curriculum approach. The terms "core curriculum" and "general education," as well as "common learnings," "unified studies," and "integrated program" were used interchangeably to denote very similar practices (Wraga, 1999, p. 113). The roots of the core curriculum can be dated as far back as the 1930s when the Commission on the Relation of School and College of the Progressive Education Association began the widely acknowledged Eight-Year Study (Loeser, 2015). Although this study will be discussed in further detail in a subsequent section, the study essentially focused on alternative curriculum approaches to the traditional separation of topics and/or disciplines (Loeser, 2015; Wraga, 1999). The term core curriculum refers to a distinct set of courses that are considered to provide students with the foundation they need for success in their future endeavours, educational

or not (Loeser, 2015; Vars, 1991; Wraga, 2009). However, when looking at the history of core curriculum it becomes apparent that the courses considered fundamental to comprise this foundation historically fluctuate (Loeser, 2015). Nonetheless, the core curriculum always seeks to provide students with the knowledge and skills they need for a variety of real life circumstances (Loeser, 2015; Vars, 1991). Accordingly, both recent and dated designs of the core curriculum have focused on the integration of curricula in order to address the concerns applicable to students at that time (Hurley, 2001; Loeser, 2015).

During the progressive movement, the core curriculum sought to depart from the classic memorization and regurgitation of knowledge (Wraga, 1999). The concerns and needs of a particular group of students were identified and then the subject matter from any discipline was utilized in order to help the students resolve those issues (Vars, 1991). It aimed to help students make sense of their personal experiences with a focus on resolving their issues or concerns (Vars, 1991). As mentioned earlier, inviting students to become a part of their own education helps them to develop critical thinking skills, relate school to real-life instances, and recognize their value as members in society (Parsons & Beauchamp, 2012; Vars & Beane, 2001). Oftentimes, the teacher would decipher a collection of typical student concerns for a specific age group and design units of study around them (Vars, 1991). There was even the implementation of an unstructured core which allowed students and teachers to create the units together (Vars, 1991). The only limitations were that the learning must be integrated, valuable, feasible, and appropriate for the students' maturity level (Vars, 1991).

Then, in 1983, a *Nation at Risk* was issued which changed everything (Kretchmar, 2008; Loeser, 2015). This publication suggested that every school in the United States of

America require students to take a prearranged core set of courses in order to better prepare them for their future endeavors (Loeser, 2015). Thus, at this time, the core curriculum became a minimum number of courses that students were required to complete (Loeser, 2015). These courses were considered to provide students with the knowledge and skill set needed to succeed in life and overcome challenges (Loeser, 2015; Vars, 1991). High schools at this time were even encouraged to expand the curriculum requirements for graduation (Loeser, 2015).

Today, the core curriculum is no more but the Common Core State Standards that are currently compulsory in most states are failing our students (Loeser, 2015). Evidence suggests that these standards do not adequately prepare students for post-secondary education and/or life beyond school (Hardman, 2009; Kim & Aktan, 2014; Loeser, 2015). As mentioned in an earlier section, students are disengaged, dropping out, and having a hard time meeting the standards being set out for them (Lake, 2000; Lee, 2014; Leiman et al., 2015; Park, 2008). They are also lacking the 21st century skills needed to succeed in todays ever-changing world (Drake, 2012). In response to these issues, the Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA) launched the Common Core State Standards Initiative (CCSSI) in 2009 (CCSSI, 2017; Loeser 2015). The state-led effort included state leaders from 48 states, two territories, and the District of Columbia (CCSSI, 2017). The initiative formed a set of English and math curriculum standards that have been implemented by 42 states, the Department of Defense Education Activity, Washington DC, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands as of 2015 (CCSSI, 2017). Common Core standards for subsequent disciplines have yet to be established (Loeser, 2015).

There is an endless global debate regarding the set of courses that are to comprise the core curriculum (Loeser, 2015). That is, opinions vary greatly when deciding which disciplines should be compulsory for students to prepare them for a prosperous life beyond school. This debate has historically extended from secondary education to colleges and universities across the nation (Loeser, 2015). Educators tend to agree with the idea that students need to leave college able to think critically, compute, reason logically, appreciate diversity, communicate effectively, and problem-solve (Loeser, 2015). However, they disagree on which disciplines should be the foundation of developing those skills (Loeser, 2015). Thus, many educators believe that the core curriculum would be more effective if it adapted an integrated curriculum approach to teaching and learning (Costley, 2015; Hinde, 2005; Marshall, 2005; Vars & Beane, 2001). Hence, the endless pendulum swinging from traditional discipline-based curriculum to more progressive, integrated curriculum approaches continues. Educational philosophies constantly shift from teacher centered, to student concerns, to subject matter acquisition, to skill based learning, to social problems and then back again (Vars, 1991).

Thematic Learning

The thematic approach to teaching and learning requires the integration of various disciplines (Chrysostomou, 2004; Hayes, 2010; Wood, 2001). The primary objective of an integrated curriculum is to pay no attention to the distinct disciplines and instead focus on the themes, the experiences or problems that need to be resolved (Chrysostomou, 2004; Merritt, 2008). As a result, thematic learning is commonly considered one of the many forms of curriculum integration (which will be discussed in a subsequent section) (Chrysostomou, 2004; Hayes, 2010; Wood, 2001). This term is closely linked to the

webbed curriculum mode of integration (Gehrke, 1998). The term thematic learning is a newer pedagogical word yet the method it represents emerged out of the integrated curriculum approach of the progressive era (Parsons & Beauchamp, 2012). Currently, thematic teaching is an instructive strategy that is widely acknowledged and implemented in classrooms worldwide.

Thematic learning is a pedagogical approach in which educators select a theme and then use the various disciplines to investigate and gain knowledge on that theme (Chrysostomou, 2004; Wood, 2001; Merritt, 2008; Burton, 2001). Some scholars even argue that in order to create a complete thematic unit, all disciplines must be integrated (Gutloff, 1996). Thus, the curriculum is essentially organized around themes that connect with multiple disciplines across the curriculum (Burton, 2001; Chrysostomou, 2004). The chosen themes are multifaceted, fascinating phenomena, often environmental or social in nature (Merritt, 2008). The themes are broad because they aim to unify all topic areas and promote stimulating class discussions that engage students in problem solving and critical thinking (Gutloff, 1996). They can be a specific topic, issue, problem, or experience often fluctuating between abstract intellectual questions and personal challenges of identity (Kim & Aktan, 2014). Students are required to explore the theme and examine it from varying perspectives (Kim & Aktan, 2014; Thomas, 2013; Wood, 2001). They investigate the topic while using techniques, skills, and ways of knowing from an assortment of disciplines (Wood, 2001). Additionally, thematic learning adapts a holistic approach to education as it embraces systems of knowledge rather than the individual elements of those systems (VanTassel-Baska & Wood, 2010).

Gutloff (1996) outlines the basic steps to creating a thematic unit of study. To

begin with, an open-ended, universal, theme needs to be chosen that caters to the relevance and interests of the students lives (Gutloff, 1996; Lake, 2000; Warwick et al., 1973). Gutloff (1996) suggests that students create the themes around self-discovery and the world around them to make the learning unmistakably relevant and engaging, though another option for theme selection is for the teacher to pick developmentally or age appropriate topics that are within their students' personal experience realm (Wood, 2001). Then, class discussions need to be conducted that center around generalizations of the topic in order to diagnostically assess preexisting knowledge bases (Gutloff, 1996). It is important to keep in mind that topics surrounding a theme are continuously shifting so students are endlessly looking at the theme from diverse perspectives (week to week and even year to year) (Gutloff, 1996). Accordingly, this requires teachers to stay up-to-date on topics under inspection. It is important to note here that Gutloff (1996) really stresses the importance of genuinely embracing the theme. That is, when someone walks into the classroom, they should know without a doubt what the topic is at that point in time.

Finally, students investigate, question, discover, and find out new information about the topic, which gradually uncovers content from various disciplines (Gutloff, 1996). They are encouraged to think critically about the concerns within their theme and to utilize the skills and techniques from various disciplines to assist them in their inquiries (Wood, 2001). Thus, depending on the lessons, students work individually and collaboratively to construct a deeper meaning of the topic using multiple discipline areas (Gutloff, 1996).

The thematic approach to teaching and learning is advocated as highly beneficial for student learning (Gutloff, 1996; Kakas & Green, 2010). Thematic learning is praised

for helping students gain deeper knowledge on a theme while increasing engagement (Gutloff, 1996; Hinde, 2005; Kakas, 2010). Also, students are found to be more motivated to learn as they investigate a topic that interests them, rather than simply memorizing an abstract concept and regurgitating it (Gehrke, 1998; Gutloff, 1996; Parsons & Beauchamp, 2012; VanTassel-Baska, & Wood, 2010). Thus, learning is more meaningful which results in long-term retention of knowledge (VanTassel-Baska & Wood, 2010). Additionally, this form of teaching and learning is often associated with collaborative learning, learning in real-world contexts, team teaching, and community learning; therefore, social skills are often developed as a result of this approach (Medellu, Lumingkewas, & Walangitan, 2015). Tanner et al. (1992) propose that organizing the curriculum around major themes is not only more sensible but is also more logical from a survival standpoint as it is impossible to learn all there is to know in a given discipline.

However, the thematic approach is oftentimes criticized for failing to highlight the connections between the various disciplines being used to explore the topic (Burton, 2001). Thus, some scholars consider thematic teaching a very low level of curriculum integration that needs development (Burton, 2001; Warwick et al., 1973). It represents a stage of integration that is more formalized and structured than other integration models (Warwick et al., 1973). Scholars suggest that in order to establish interactive relationships among the disciplines, a higher level of integration is essential (Burton, 2001). Lastly, thematic instruction often resembles a spiral curriculum in that students may be exposed to the same concepts year after year as they move up grade levels (Wood, 2001). Some scholars suggest this is too repetitive and others suggest it reinforces and helps to build upon knowledge (Wood, 2001).

Inquiry-Based Learning

Inquiry learning is an antecedent of curriculum integration (Drake et al., 2014). It initially emerged in the 1960s, as it was essentially the trademark of both progressivism and constructivism (Drake, 2012; Pedaste et al., 2015). Thus, theorists such as Piaget, Dewey, and Vygotsky are all responsible for the establishment of inquiry-based learning. All three of these contemporaries believed that authentic learning is attained through personal experiences with the real world (Hogan, & Bertram, 2013; Wong, 2013; Wraga, 1997; Yun, 2000). Accordingly, like progressivism and constructivism, inquiry-based learning was a response to the mainstream discipline-based curriculum of that time (Dostál, 2015; Pedaste et al., 2015). In the 1960s, Joseph Schwab created four distinct levels of inquiry (Dostál, 2015). These were later formalized by Marshall Herron in 1971 when he created the Herron Scale to identify the level of inquiry taking place during a lesson (Dostál, 2015). The levels were confirmative inquiry, structured inquiry, focused inquiry, and open inquiry (Dostál, 2015). The National Science Education Standards defines the term inquiry as:

> a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze and interpret data; proposing answers, explanations, and predictions; and communicating the results. (As cited in Howes Lim, & Campos, 2009, p. 190)

Inquiry-based learning is often considered a means to solve problems and involves the application of numerous problem-solving skills (Dostál, 2015; Pedaste et al.,

2015). Moreover, it requires the learner to take responsibility of acquiring new knowledge and to actively participate in the process (Pedaste et al., 2015). The role of the teacher is not to be a transferor or provider of knowledge but rather, a facilitator (Pedaste et al., 2015). Teachers encourage question asking, and assist students in gathering evidence from real world contexts to address these questions (Howes et al., 2009). That is, the teacher is there to assist the students in their journey of discovering new concepts rather than dictate it.

It is important here to address the various levels of inquiry according to the Herron scale. To begin with, confirmative inquiry refers to a form of inquiry where the question and method are given to the students and the results are already identified (Dostál, 2015). Hence, the sole purpose of the inquiry is to confirm the results (Dostál, 2015). Structured inquiry is when the teacher explains the question and method to the students and the results are still identified (Dostál, 2015). Thus, the students are required to come up with an explanation of the provided phenomenon (Dostál, 2015). The next form of inquiry is called focused inquiry. This is when the teacher presents a research question and the students form a methodological approach and implement it (Dostál, 2015). Finally, open inquiry lets the students ask the question and formulate the method independently (Dostál, 2015). Then they perform the necessary research and determine the results (Dostál, 2015). Nevertheless, it is essential to point out that just like the integrated curriculum approach, inquiry-based learning should not be considered a distinctive, universal teaching method as implementation styles vary greatly from class to class (Howes et al., 2009).

Studies suggest that inquiry-based learning is an effective teaching method to

foster authentic learning (Dostál, 2015; Pedaste et al., 2015; Zhbanova et al., 2010). This method has been said to actively engage students in an authentic inquiry process (Pedaste et al., 2015; Tong et al., 2014). That is, students are actively participating in the learning process rather than memorizing it or being told about it. Thus, learning becomes deep and meaningful to the student (Tong et al., 2014). Inquiry-based learning is also considered a means to better understand the complexity of human experiences as students compare and construct personal meaning that connects with their own social background (Nompula, 2012).

Analogous with progressivism and constructivism, inquiry-based learning is concerned with solving relevant, real world concerns rather than meeting specific discipline-based standards. Students and/or teachers formulate questions and hypotheses that are universal in nature. Thus, they often require knowledge from multiple discipline areas to investigate and resolve them (Zhbanova et al., 2010). It also provides students with opportunities to communicate in a variety of forms using knowledge and skills from various disciplines (Tong et al., 2014). The inquiry-based approach can be limited to a specific discipline however this is considered less effective than authentic inquiry learning (Board, 2013).

Speaking from personal experience, Board (2013) has created a document that outlines how to effectively implement an inquiry-based integrated curriculum. She begins by using class discussion to pose universal, thought provoking questions to her students such as “what is hope?” (Board, 2013, p. 41). She also insists that the initial questions are broad enough to incorporate strands from more than one discipline and allow for multiple interpretations from her students (Board, 2013). She then looks at the curriculum

standards from the disciplines she wants to cover and creates sub questions to form the foundation of the inquiry-based learning (Board, 2013). Then, her lessons and activities include a variety of disciplines and are planned to assist her students in making discoveries that will help them to better answer these questions (Board, 2013). She comes up with possible trip ideas and a culminating task where students choose a means to communicate their new learning (Board, 2013). Board outlines six suggestions when adapting an inquiry-based approach which are as follows; be flexible with your plans, allow students to communicate their understanding in a variety of forms, share ideas as a group, utilize time and resources, build a classroom community, learn with the students, document and reflect (Board, 2013). Although this is by no means a universal standard for inquiry-based and integrated learning, it is an effective/ helpful model in adapting an inquiry-based approach to teaching and learning.

Integrated Curriculum Theory in the 21st Century

In recent years, curriculum integration has been adapted in numerous countries all over the world (Chrysostomou, 2004; Park, 2008;). Associations such as the National Research Council, the American Association for the Advancement of Science, the directives of the European Commission, the National Middle School Association, National Association for Core Curriculum, and the National Council of Teachers and Mathematics have recommended the use of integrated curriculums (Crisan, 2014; Drake, 2012; Zhou & Kim, 2010).

There also have been integrated curriculum efforts across the world in places such as Korea (Park, 2008), Japan (De Araujo, et al., 2013), Finland (Garner, 2015), Jamaica (Jamaica Ministry of Education and Culture, 1999), and Trinidad and Tobago (Yvonne,

2015). Scotland's new Curriculum for Excellence (Fenwick et al., 2013), Taiwan's curriculum for grades 1-9 (Richards & Kroeger, 2012), England's National Primary Strategy (Hayes, 2010), the national curriculum for Northern Ireland and New Zealand (Parker et al., 2012), Romania's 1st- and 2nd-grade curricula (Crisan, 2014), and the English Language Arts Common Core (Doyle et al., 2014) in California are also examples of modern adaptations of curriculum integration. The University of Utah has even developed teacher education programs for integration (Hardman, 2009).

In Canada, Prince Edward Island has come out with a government document for kindergarten educators (PEI Ministry of Education, 2008). This document includes the philosophy behind curriculum integration, integration practices, as well as assessment and evaluation suggestions (PEI Ministry of Education, 2008). There are also resources offered by the Ontario Government to assist teachers in curriculum integration. For example, they provide a document that offers educators with important guidelines when integrating curricula as well as helpful tips (Drake & Reid, 2010a). Moreover, this same document also offers an example of an integrated unit so that educators can see first-hand how to make connections between expectations (Drake & Reid, 2010a). Another Ontario document available online provides educators with a step by step method of planning an integrated unit (Drake & Reid, 2010b). Thus, due to this recent popularity, scholars, educators, teachers, parents, and students alike dispute the value and feasibility of integrated curriculums.

These discussions center on brain functioning research, the modes and styles of integration, and of course whether this approach should ultimately be utilized worldwide or not. Thus, the following sections will begin by exploring the ways in which

neurological functioning actually mirrors curriculum integration (Kakas, 2010; Marshall, 2005; Parker et al., 2012; Vitulli et al., 2013). Next, the countless modes of integration will be described. Then, the dispute between curriculum integration supporters and critics will be depicted. Finally, those who have experience with curriculum integration offer a number of integration suggestions in an attempt to contribute to establishing much needed support, guidelines and information for teachers worldwide.

Brain Functioning

Although it is a controversial topic, many scholars believe that the integrated curriculum approach reflects how we as humans learn (Kakas, 2010; Marshall, 2005; Parker et al., 2012; Vitulli et al., 2013). In neurological discussions, it is widely acknowledged that integrative curriculum works with the brains' natural functioning rather than against it (Kakas, 2010; Vitulli et al., 2013). Brain-based research reveals that the brain seeks patterns while repelling personally irrelevant, learned in isolation, and fragmented information (Park, 2008). That is, the brain creates a web of information that distinguishes patterns (Frazee & Rudnitski, 1995; Kakas, 2010; Vitulli et al., 2013). Thus, the traditional discipline-based education may actually hinder student achievement as learning occurs faster and more thoroughly when it is presented in relevant contexts (Lake, 2000). Accordingly, cognitive psychologists propose that people learn best when they take multiple perspectives into consideration, are fully submersed in the educational experience, and make connections to various phenomena (Park, 2008).

From a more neutral perspective, Piaget (1963) and Cronwell suggested that the brain organizes new knowledge in relation to previous experiences and the preexistent meaning that was formed from those experiences (as cited in Lake, 2000, p. 6). Then, the

information is placed into our schemata or the preexisting conceptual compartments in the brain (Marshall, 2005). Today, cognitive psychologists continue to develop and critique Piaget's theory in declaring that "the mind is a system constructed of basic units and that cognition is a function of organizing information into modules within a larger mental structure," (as cited in Marshall, 2005, p. 229). Thus, schema theory research to this day indicates that learning occurs through connecting pre-existing knowledge to new knowledge (Brand & Triplett, 2012; Tanner et al., 1992; Willis, 2011; Wood, 2001). Lakoff and Johnson (1999) contribute to this theory in proposing that "the mind conceptualizes the world by placing phenomena in categories" (as cited in Marshall, 2005, p. 229), and expand upon this notion in suggesting that while the mind is categorizing phenomena, it thinks analogously; that is, it views phenomena in relation to other phenomena (Marshall, 2005). Similarly, decades of research imply that when a person has a shallow understanding of a concept, he or she relies on detached, rote-level recall while experts of a topic form connections and relationships between the knowledge to better access it for recall (Brand & Triplett, 2012; Marshall, 2005). Thus, while Piaget and Cronwell's research is neutral, it can arguably support or discourage curriculum integration.

Similarly, studies have shown that students learn better when higher-order thinking skills are rooted in the content (VanTassel-Baska & Wood, 2010). Executive functions are responsible for higher level thinking skills, and these neural networks undergo the most development during the school years (Willis, 2011). Accordingly, teachers have the responsibility of encouraging the activation of these circuits (Willis, 2011). Willis (2011) affirms that when the brain does not use information for an extended

amount of time, pruning takes place. Pruning is when the brain basically dissolves small isolated neural networks of unused facts (Willis, 2011). Thus, some believe that integrating the curriculum helps to stop this pruning from happening as it encourages making connections between the neural networks (Willis, 2011). Yet, others could argue that the traditional disciplinary curriculum functions the same.

Finally, expanding upon newly acquired knowledge is a key component of full comprehension (Marshall, 2005). Learning theory literature advises that authentic learning requires the student to fully understand or grasp the concept which entails remembering information but also understanding how information fits together (Marshall, 2005). Accordingly, both integrated and disciplinary curriculum approaches could reflect these current neurological theories. In theory, they both seek to make connections between ideas, concepts, phenomena, and skills to foster better understanding. Thus, neurological findings have been argued both in favor of and against curriculum integration.

Modes of Integration

Some scholars suggest that the various modes of integration should be viewed as levels of integration (Lake, 2000; Park, 2008). The idea of an integration continuum that moves from low to high integration is widely acknowledged in the educational field (Chrysostomou, 2004; Hinde, 2005; Khalil & Kibble, 2014; Lake, 2000; Park, 2008; Parker et al., 2012). The continuum begins with traditional discipline-based education, then works through various models that integrate a few disciplines, and ends with models that focus on the integration of knowledge within the learner (Drake et al., 2015; Harrell, 2010; Khalil & Kibble, 2014; Park, 2008). Moreover, some scholars would rather view

this continuum as a staircase that represents the stages of development towards a fully integrated curriculum (Gresnigt et al., 2014).

However, other contemporaries do not agree with the notion of a curriculum integration continuum or staircase (Chrysostomou, 2004; Drake et al., 2015; Park, 2008). Hargreaves, Earl, and Ryan (1996) criticize the continuum for ignoring the complexity of integration and grouping behaviours together that do not relate to one another (Drake et al., 2015; Park, 2008). Such a continuum tends to imply that more integration is better than or more innovative than less (Chrysostomou, 2004; Drake et al., 2015; Park, 2008). The integration models found higher on the continuum are sometimes considered more valuable or effective then the lower models (Chrysostomou, 2004; Park, 2008). Oftentimes, the models that require less integration are used as stepping-stones for deeper integration in the future (Consortium of National Arts Education Associations, 2002; Drake et al., 2015; Fogarty, 1991). However, these modes of integration are by no means a representation of stages to full or superior integration (Gresnigt et al., 2014). No single curriculum integration approach is more authentic than another (2014). The different modes and styles of integration are purely descriptive (2014). Different contexts simply call for distinctive approaches to integration (Park, 2008). Thus, the position of integration models on the continuum do not reflect their worth or efficiency (2008).

Similarly, the various styles or modes within the integrated curriculum approach itself are frequently viewed on a similar scale of integration progression (Park, 2008). Generally, it is established that from multidisciplinary, to interdisciplinary, cross-disciplinary, and transdisciplinary there is an evident line of progression however, this is still a point of debate in education. Over the last two decades, a multitude of curriculum

integration modes, levels, styles, and degrees have been outlined in the literature (as you can see in the definition section) (Harrell, 2010). Therefore, these modes, levels, styles, and degrees of integration lack coherence in regards to the terms used to reference each model and lend to the difficulty in implementation for teachers (Judson & Sawada, 2000). Disciplinary, multidisciplinary, interdisciplinary, cross-disciplinary, and transdisciplinary are all integration styles that many scholars use interchangeably when referring to integrated curriculum (Chrysostomou, 2004). Yet, they do differ slightly in both theory and practice, which will be described in the following section (Chrysostomou, 2004). Accordingly, it is important to keep in mind that one model of integration could easily have a variety of terms used to identify it. Furthermore, in previous and future sections the term integration will be used in general as a sort of umbrella term for all integration models (Lederman & Niess, 1998). Comparable to Drake et al. (2015), I did this to avoid repetition and to manage simplicity in writing.

This section will begin with defining discipline-based and integrated curriculum for the point of comparison. Then it will outline what is considered the styles of integration (multi, inter, intra, cross, plus, trans), then the countless modes of integration (connected, sequenced, shared, webbed, threaded, etc.). Finally, the two general forms of integration (service connections, symmetric correlations/syntegration) and two levels of integration are discussed (knowledge and learner- initiated integration). Oftentimes, the literature will group the various modes together, yet this is another point of debate in educational discussions so this paper will simply provide the terms and definitions that exist in the literature today. The styles of curriculum integration are as follows (in no particular order):

The *disciplinary / isolated / cellular / fragmented* curriculum represents the traditional approach to teaching and learning (Gresnigt et al., 2014). In a disciplinary curriculum, the subjects or disciplines and processes within them remain separate and distinct areas of study with distinct time blocks dedicated to each (Fogarty, 1991; Hayes, 2010; Jacobs, 1989).

The *integrated* curriculum is organized around big ideas, personal experiences and social concerns, with subject matter incorporated only as it is needed in order to better understand the experience or concern under investigation (Fogarty, 1991; Wraga, 2009). This approach requires solving problems, investigating themes and utilizing processes from a variety of discipline perspectives (as cited in Hayes, 2010, p. 382; see also Thomas, 2013). It comprises the integration of disciplines, content, processes, skills, and effective activities and goals (Hayes, 2010, p. 382).

The *multidisciplinary* curriculum is considered the most similar to the disciplinary model (Beane, 1997). It requires studying a research topic or real life problem from a variety of discipline perspectives at once with no discernible attempt to integrate them (Brough, 2012; Gresnigt et al., 2014; Kim & Aktan, 2014; Nicolescu, 2014). This approach looks at the specific curriculum standards of each discipline and then formulates a theme from them (Beane, 1997). Once the theme is chosen, each discipline contributes to it, which results in their preservation (Beane, 1997; Kim & Aktan, 2014; Drake et al., 2015). Some forms of this approach require the students to complete a culminating task that integrates the content and skills from each of the disciplines (Drake et al., 2015). Thus, this approach essentially surpasses the limitations of disciplinary research (Fenwick et al., 2013; Kim & Atkan, 2014; Nicolescu, 2014). The disciplines

remain separate and/or juxtaposed as they essentially rotate around a shared topic (Brough, 2012; Fenwick et al., 2013).

The *intradisciplinary* curriculum is also closely linked to disciplinary as it refers to integration that is confined within a single discipline (Drăghicescu et al., 2013; Merritt, 2008). That is, the integration takes place within one discipline such as science integrating life, earth, chemistry and physics together (Merritt, 2008).

The *interdisciplinary* curriculum incorporates knowledge and skills from two or more disciplines to examine a more integrated/complex central theme, problem, topic, experience or issue that cannot be clarified from just one sole discipline (Drăghicescu et al., 2013; Hayes, 2010; Lake, 2000; Nicolescu, 2014; Steiner & Posch, 2006). That is, the various disciplines are still separately intact while the central topic or idea organizes the curriculum (Drake et al., 2015). The focus is to find the connections between disciplines (Drăghicescu et al., 2013; Lake, 2000; Parsons & Beauchamp, 2012). Thus, like multidisciplinary integration, this approach exceeds discipline boundaries but its aim remains within the framework of disciplinary research because it maintains focus on meeting each discipline-based standard (Merritt, 2008; Nicolescu, 2014). Interdisciplinary integration can generate new disciplines such as quantum cosmology because it does not simply break the disciplines into parts or sections, but unites them (Nicolescu, 2014). It also requires the discipline lines to be blurred as focus is put on developing the skills and concepts that are highlighted across the curriculum disciplines such as problem solving (Drake et al., 2015; Gresnigt et al., 2014; Steiner & Posch, 2006).

The *cross-disciplinary* curriculum involves viewing one discipline from the perspective of another one (Jacobs, 1989). For example, a Language course that explores

a novel by means of musical configurations, development, and repetition would be cross-disciplinary (Burton, 2000). The aim is to get students to use the distinctive content and processes from an outside discipline (Consortium of National Arts Education Associations, 2002; Parker et al., 2012). Accordingly, this approach often outlines the similar processes that can be found across the disciplines (Consortium of National Arts Education Associations, 2002). It usually involves two teachers of different subject areas working together to plan around a shared topic or problem (Consortium of National Arts Education Associations, 2002; Parsons & Beauchamp, 2012). Hence, this approach often requires team teaching or at least sharing of expertise (Alberta Education, 2012; Consortium of National Arts Education Associations, 2002).

The *plurdisciplinary* curriculum refers to the combination of disciplines that are considered at least marginally related such as math and physics (Burton, 2000; Jacobs, 1989).

The *transdisciplinary* curriculum goes beyond the limitations of the disciplines (Burton, 2000; Drake et al., 2015; Gresnigt et al., 2014; Steiner & Posch, 2006). It begins with a real-world problem and then knowledge from the disciplines are brought in as needed in order to resolve the problem (Drăghicescu et al., 2013; Drake et al., 2015; Gresnigt et al., 2014; Jacobs, 1989). Essentially, it is concerned with the space between, across, and beyond the disciplines (Nicolescu 1996; Steiner & Posch, 2006). The goal of transdisciplinary education is to help students better understand the world they live in, which requires the unity of knowledge rather than the separation of discipline areas (Drăghicescu et al., 2013; Gresnigt et al., 2014; Nicolescu 1996). Accordingly, student inquiries form the focus of the curriculum organization (Drake et al., 2015).

Multidisciplinarity and interdisciplinarity still operate within disciplinary boundaries whereas transdisciplinary has no boundaries (Nicolescu, 2014). This approach comprises a very holistic and student-centered approach to teaching and learning (Gresnigt et al., 2014).

The *connected / aware* curriculum explicitly connects topics within or between disciplines (Fogarty, 1991; Hayes, 2010). Disciplines remain separate while the relationships between concepts, skills, ideas; even semesters and grade levels are highlighted (Fogarty, 1991). For example, a connection between the rock unit and simple machines unit is demonstrated to the students (Fogarty, 1991). Thus, it requires that educators make deliberate connections within or between the various topics within a discipline rather than assuming the students will find them for themselves (Fogarty, 1991; Gresnigt et al., 2014).

Fogarty compares the *sequenced / correlated* curriculum to eyeglasses as it utilizes two separate disciplines (the lenses) that are connected by a universal framework or topic (as cited in Kim & Aktan, 2014, p. 457). That is, teachers arrange the order of their units so that the topics coincide with one another (Fogarty, 1991). For example, a unit on spiders can be accompanied by reading Charlotte's Web (Fogarty, 1991). Thus, the two disciplines are taught analogously (Gresnigt et al., 2014; Hurley, 2001). Additionally, the activities from each discipline attempt to enhance the understanding of the topic or concern being examined (Fogarty, 1991). Though the disciplines explore a collective topic, they remain separate (as cited in Hayes, 2010, p. 383).

The *shared* curriculum refers to when two disciplines are used to interpret a common unit, more so than the sequenced model (Kim & Aktan, 2014). There are big

concepts or ideas that form out of the broad nature of some disciplines such as art, dance, music, and drama creating the Humanities (Fogarty, 1991). In a shared curriculum, learning occurs within these complimentary disciplines (Fogarty, 1991). That is, curriculum planning is formulated around shared concepts and skills found in two or more disciplines (Fogarty, 1991). Thus, learning relies on overlaps or mutual concepts, skills, and attitudes shared between disciplines (Fogarty, 1991).

The *webbed* curriculum model provides a broader view of curriculum integration in which assorted elements of the disciplines are webbed to a theme (Fogarty, 1991; Kim & Aktan, 2014). That is, the various disciplines are used to provide a variety of perspectives on a single theme (Fogarty, 1991; Kim & Aktan, 2014). Accordingly, this approach is commonly associated with thematic teaching and learning (Hayes, 2010). It is also concerned with the unity of knowledge across all disciplines (Hinde, 2005).

The *threaded* curriculum emphasizes the metacurriculum that surpasses all subject matter content (Fogarty, 1991). It focuses on developing a set of thinking skills that are infused into the current curriculum standards (Fogarty, 1991). This model is said to help improve social, reading, studying, thinking and prediction skills in sequence (Fogarty, 1991; Hayes, 2010; Kim & Aktan, 2014). It also allows students to become aware of and control their thinking and learning strategies for all aspects of life (Fogarty, 1991).

The *fusion / infusion/ nested* curriculum is when instruction from one discipline is essentially nested within another discipline and focused around themes (Gehrke, 1998; Gresnigt et al., 2014; Hinde, 2005; Vars, 1991). Two disciplines are essentially joined together to form a new unified idea and/or even subject (Harrell, 2010; Hinde, 2005;

Vars, 1991; Wraga, 2009). It uses elements of one discipline to enrich the learning of another discipline. For example, physics and chemistry utilized in collaboration to form physical science (Harrell, 2010). Fogarty (1995) claims that this approach aims to develop critical thinking skills, content knowledge, problem solving and social skills (as cited in Hayes, 2010, p. 382). Moreover, it is concerned with identifying and building strong relationships between the disciplines (Harrell, 2010; Parsons & Beauchamp, 2012; Wraga, 2009). Thematic units are usually an example of the fusion approach (Harrell, 2010). Additionally, a collaborative team is often involved in the curriculum planning and implementation process (Consortium of National Arts Education Associations, 2002).

In the *immersed* curriculum, all learning is seen through the perspective of one sole area of interest (Fogarty, 1991; Hayes, 2010). That is, student interests shape the integration that occurs because all information, from every discipline, is funneled through the students' area of interest (Fogarty, 1991; Hinde, 2005). Thus, students are motivated intrinsically as all learning takes place within and from a desire to know about their chosen topics (Fogarty, 1991).

The *networked* curriculum requires that students select a network of resources and experts to integrate content and processes (Hayes, 2010). Students experience an ongoing external source of information that they come to depend on as a primary source of knowledge (Fogarty, 1991). Students then filter that information through the lens of their own chosen area of interest (Fogarty, 1991). Accordingly, just like immersed, students are responsible for directing the integration process as they decide which networks are needed for their research (Fogarty, 1991; Hinde, 2005).

The *parallel* curriculum refers to when two disciplines are used in coinciding events (Frazee & Rudnitski, 1995). It requires simultaneous teaching of disciplines through equivalent concepts and processes (Consortium of National Arts Education Associations, 2002; Gresnigt et al., 2014; Hurley, 2001; Jacobs, 1989). However, the discipline content does not change, just the order it is presented in (Jacobs, 1989). It also requires two teachers working together on a shared theory or topic at the high school level (Consortium of National Arts Education Associations, 2002; Parsons & Beauchamp, 2012). The disciplines remain synchronized with one another so students sometimes make connections between the two as a result (Consortium of National Arts Education Associations, 2002). Students are expected to find the implicit connections on their own between the two disciplines to enrich their understanding of the topic or concept (Jacobs, 1989).

The *harmonization curriculum* unifies knowledge by utilizing various elements of the curriculum (from all disciplines) and fitting them together (Costley, 2015; Harrell, 2010). Harmonization is often praised for developing higher level thinking skills across the curriculum (Harrell, 2010).

The various modes of integration can be generalized to form two different approaches to curriculum integration (Parsons & Beauchamp, 2012; Russell-Bowie, 2009). The first is *service connections* in which one subject aims to enrich learning in another discipline (Parsons & Beauchamp, 2012; Russell-Bowie, 2009). Curriculum outcomes are learned and strengthened in one discipline by using resources from another discipline (Russell-Bowie, 2009). Yet, the curriculum outcomes from the servicing discipline are not obtained (Russell-Bowie, 2009). For example, songs from the subject

of music can assist students in learning French vocabulary. Hence, this approach can engage and motivate students as they learn in ways that cater to their learning preferences (Russell-Bowie, 2009).

Finally, *syntegration / symmetric correlations* promote a sort of unity of knowledge where various disciplines collectively explore topics, problems, themes, or inquiries in order to achieve their separate curriculum standards as well as generic outcomes (Parsons & Beauchamp, 2012; Russell-Bowie, 2009). This approach focuses on broad themes or concepts that transcend the discipline boundaries so that these disciplines can help to investigate the theme or concept in a meaningful way (Lake, 2000; Russell-Bowie, 2009). The knowledge gained in one discipline area is used to reinforce and expand upon the content and skills in another subject area (Lake, 2000). Thus, the integrity of each discipline is upheld while the curriculum standards for all of them are achieved (Russell-Bowie, 2009). Moreover, skills that are not found in curriculum standards are developed as well such as problem solving, observation, teamwork, critical thinking, and research (Russell-Bowie, 2009). Students learn in a broader context, which makes it more interesting, relevant, enjoyable and multifaceted (Lake, 2000; Russell-Bowie, 2009). Thus, a high level of learning is attained through applying, analyzing, comparing, evaluating, and synthesizing concepts and ideas across the disciplines (Russell-Bowie, 2009).

Some scholars have suggested that there are three degrees of integration that encompass all of the integration styles and modes: *Partial integration* is when the disciplines are taught partially together and partially in isolation (Gresnigt el al., 2014; Hurley, 2001). *Enhanced integration* refers to the integration of two subjects, but one is

more dominant than the other (Gresnigt et al., 2014; Hurley, 2001). *Total integration* is considered the highest level of integration in which two or more disciplines are taught together and in balance (Gresnigt et al., 2014; Hurley, 2001). In a high school setting, all staff involved need to agree on a collective theme or focus that all learning is geared towards (Vars, 1991).

Burton (2001) systematizes three levels of integration beginning with thematic integration (discussed in a previous section) and subsequently (as cited in Drake et al., 2015, p. 7):

Knowledge Integration: this integration occurs when interactive relationships are identified between the content and skills in two or more disciplines (Burton, 2001; Chrysostomou, 2004; Drake et al., 2015). Thus, the teacher becomes the source of knowledge so he or she needs to be knowledgeable in each of the discipline areas (Chrysostomou, 2004). It is important to note that this form of integration can only be successfully accomplished when there are logical and direct relationships to the knowledge in the disciplines being utilized (Burton, 2001). That is, the integration should feel natural rather than forced.

Learner-Initiated Integration/ Self-Regulated Learning: in this approach, students are made responsible for their own metacognitive, motivational, and behavioural learning outcomes (Steiner & Posch, 2006). They utilize their own feelings, thoughts, actions, and beliefs to achieve their learning goals (Steiner & Posch, 2006). Moreover, they make their own connections between the subject areas by applying previous knowledge to new contexts (Burton, 2001; Chrysostomou, 2004; Drake et al., 2015; Parsons & Beauchamp, 2012). Thus, this form of learning is self-empowering, student-centered, and holistic in

nature. The teachers' role is that of a facilitator who helps when needed (Steiner & Posch, 2006). This mode is considered the highest level of integration as it's mainly concerned with developing higher level thinking skills such as reasoning, communication, critical thinking, and problem solving (Burton, 2001; Chrysostomou, 2004; Drake et al., 2015). Learner-initiated integration / self-regulated learning is commonly considered the most important form of integration as it teaches students life-long skills to help them be successful in their futures (Burton, 2001; Chrysostomou, 2004).

Finally, it is essential to note here that the notion of distinguishing styles or modes of curriculum integration has been a subject of extensive debate over the years (Gresnigt et al., 2014). Beane and some of his contemporaries believed that true curriculum integration was not concerned with the subject-area lines; it was simply organized around real world problems that require the application of knowledge (Gresnigt et al., 2014, p. 50). Venville did not care about following an integration model or meeting curriculum standards, but rather, resolving a real-life problem at hand (Gresnigt et al., 2014). Similarly, Drake found that interdisciplinary, multidisciplinary, and transdisciplinary integration efforts tend to become basically the same approach when adapted by educators (Drake et al., 2015). The issue is that no matter what form of integration that is applied, every school district requires accountability (Drake et al., 2015). Thus, the learning depends on the teacher who is adapting the approach, the curriculum standards for that province, and the community at large (Drake et al., 2015).

Supporters of Curriculum Integration

Advocates of the integrated curriculum approach accuse the current discipline-based curriculum of being "confined to that anointed by scholars in academic disciplines,

and others of the dominant culture, organized in ways that are convenient to them, and presented as a kind of 'capital' accumulated for some future time or for cultural ornamentation" (Beane, 1997, p. 56). Consequently, it is common for students to regard school as abstract and irrelevant because they are denied the chance to learn things that they can use in the real-world and are interested in (Beane, 1997). Thus, critics suggest that teachers are employing a curriculum that is not only ineffective, but unethical as well (Beane, 1997).

The following section is divided into distinct areas of educational benefits: Curriculum coherence/cohesion; reflects real-life, academics; connections between the disciplines; adapts to all learning styles; authentic assessment; and teacher benefits.

Curriculum Coherence/Cohesion

In contrast to traditional education, the integrated curriculum has the potential to be coherent, unified, and connected to create a whole out of the disciplines (Costley, 2015; Hooper et al., 2014; Merritt, 2008; Parsons & Beauchamp, 2012). Some supporters call this curriculum coherence/cohesion (Merritt, 2008; Warwick et al., 1973) or a unified curriculum (Lake, 2000); that is, knowledge and experience are viewed as whole entities rather than fragmented pieces (Hooper et al., 2014; Leung, 2012; Zhou & Kim, 2010), which is important because supporters believe that this better reflects how the current globalized world really is (Harrell, 2010; Kim & Aktan, 2014; Mei, 2009; Thomas, 2013). Students learn what they are taught, so when educators teach in a way where all knowledge is disconnected from one another, students learn that (Gullat, 2008; Hayes, 2010; Lake, 2000). They are wrongly taught to believe that there are artificial barriers within knowledge components- that the knowledge of the world is fragmented (Hayes, 2010; Hooper et al., 2014).

Reflects Real-Life

Supporters suggest that the discipline-based curriculum and even the individual disciplines themselves do not reflect the complexity of life today because both have changed very little over the years (Drake et al., 2015; Harrell, 2010; Parsons & Beauchamp, 2012). Furthermore, it is argued that the integrated curriculum better prepares students for the complex issues of the globalized real world and the fast-paced integrated nature of the 21st century (Drake et al., 2015; Lake, 2000; Mei, 2009). It focuses on developing the 21st-century skills that are imperative for a successful contemporary life (Gresnigt et al., 2014; Hooper et al., 2014).

Accordingly, supporters suggest that the integrated curriculum gives students a better understanding of the world and how it works (Beane, 1997; Merritt, 2008; Wood, 2001). When creating the curriculum, broad themes are explored in meaningful ways (Hayes, 2010; Parsons & Beauchamp, 2012; Russell-Bowie, 2009; Thomas, 2013). Moreover, the focus is put on world problems or issues that have significance, in the form of big ideas (such as the environment, discrimination, or cause and effect), without any regard to subject-area lines (Costley, 2015; Fenwick et al., 2013; Lake, 2000; Zhbanova et al., 2010). Thus, students are taught to think, use, and understand new knowledge in terms of real world contexts rather than the discipline it falls under. Accordingly, learning is more relevant as it reflects the students' lives (Costley, 2015; Drăghicescu et al., 2013; Hayes, 2010; Kim & Aktan, 2014; MacMath et al., 2010; Parsons & Beauchamp, 2012). Supporters also claim that students are more likely to succeed because they can better understand why they are learning the content (Beane, 1997; Costley, 2015; Kim & Aktan, 2014).

Integration supporters also assert that the integrated curriculum can teach students about social values such as moral responsibility and social injustices (Drake, 2012; Merritt, 2008; Parsons & Beauchamp, 2012). It creates more interested, considerate, and involved citizens who can make intelligent decisions about current events and how to resolve them simply because that is what they are learning about (Brough, 2012; Drake et al., 2015; Hooper et al., 2014; Zhbanova et al., 2010). Trips within the community to museums, businesses, parks, etc. are common in an integrated curriculum (Burton, 2001; Virtue, Wilson, & Ingram, 2009; Wilson, 2011). Thus, this approach also fosters school and community involvement (Costley, 2015; Post et al., 1997; Vega, 2013). Students learn about concepts and identify relationships that are important to society and transcend all disciplines such as gender, race, and religion (Bullock et al., 2002; Costley, 2015; Post et al., 1997).

As such, the integrated curriculum approach allows students to engage in personal and social action (Beane, 1997; Clark, 2011; Costley, 2015; Mei, 2009; Zhbanova et al., 2010). It gives them the opportunity to look at their own world and the cultures within it to better understand it and see themselves as a part of it (Barrette, Paesani, & Vinall, 2010; Kim & Aktan, 2014; Thomas, 2013; Vitulli et al., 2013). Integration can not only better engage students, but create a meaningful connection with their personal academic progress in order for them to understand on a deeper, broader level (Costley, 2015; Lake, 2000; Marshall, 2005; Nathan, 2008; Russell-Bowie, 2009; Vitulli et al., 2013). Hence, students experience an increased retention of learning (Khalil & Kibble, 2014; Vitulli et al., 2013) or what supporters like to call life-long learning (Costley, 2015; Lake, 2000; Merritt, 2008).

Integrated Curriculum and Academic Achievement

It is well documented that students in an integrated curriculum do as well as, and often greater than those partaking in a traditional discipline-based curriculum (Crisan, 2014; Hovland et al., 2013; Tong et al., 2014; Zhbanova et al., 2010). Accordingly, supporters advocate the use of integrated curriculums to improve student academic achievement. They suggest that the integrated curriculum approach is a change from memorizing facts to thinking, connecting, and creating meaning with those facts (Costley, 2015; Drake et al., 2015; Virtulli et al., 2013). Supporters also propose that the integrated curriculum approach creates a classroom environment "where [personal] meaning and purpose are tightly woven with intellect and action, where compassion and care are infused with insight and knowledge" (Hooper et al., 2014, p. 56).

Supporters suggest that the integrated curriculum can have practical benefits to improve student learning as well. First and foremost, when adapting an integrated approach to curriculum, teachers are not only encouraged but also required to reflect on and evaluate their own pedagogy (Fenwick et al., 2013; Nathan, 2008; Parsons & Beauchamp, 2012), which evidently results in a more effective educator (Burton, 2001; Lake, 2000; National Council of Teachers of English, 2011). Some supporters also suggest that the integrated curriculum provides a means to achieve curriculum standards more easily as they can be combined and addressed simultaneously (Khalil & Kibble, 2014). Therefore, this approach can be a better way for teachers to manage the curriculum (Khalil & Kibble, 2014; Zhbanova et al., 2010). Furthermore, focusing lessons around big ideas can also help teachers to be more efficient in their planning (Drake et al., 2015; Zhbanova et al., 2010). Teacher creativity is encouraged when

planning lessons (Burton, 2001; Drake, 2012; Lake, 2000) because they have freedom, autonomy, and the power of shaping their own curriculum to answer their specific student's needs (Richards & Kroeger, 2012). Accordingly, teachers can better reach all of their students seeing as student diversity is only becoming more and more prevalent in classrooms (Burton, 2001).

Arguably, the main difference between the integrated curriculum and the traditional discipline-based one is that the integrated approach is meant to be student centered, so the students are active in their learning rather than passive (Brough, 2012; MacMath et al., 2010; Wong, 2013). The students participate in their own learning process as they often help to shape the curriculum with their teacher (Beane, 1997; Lake, 2000; Richards & Kroeger, 2012). This notion brings new meaning to the curriculum and school as an experience (Beane, 1997; Costley, 2015) because it challenges the teacher–student power relation and the idea that academicians and bureaucrats should be responsible for shaping the curriculum (Beane, 1997; Burton, 2001; Bullock et al., 2002; Thomas, 2013). Thus, this curriculum approach is a shift towards a more democratic education showing value in esteeming diverse perspectives (Beane, 1997; Bullock et al., 2002; Costley, 2015; Lipka et al., 1998; Mei, 2009), including student viewpoints (Beane, 1997).

The integrated curriculum often utilizes student interests which supporters suggest enables enjoyment of learning because they are given the opportunity to explore their chosen personal curiosities (Beane, 1997; Costley, 2015; Lipka et al., 1998; Parsons & Beauchamp, 2012; Russell-Bowie, 2009). Students create connections between new knowledge and their past and present experiences (Drăghicescu et al., 2013; Harrell,

2010; Howes et al., 2009; Thomas, 2013), which enable them to construct and reconstruct their knowledge bases (Harrell, 2010; Merritt, 2008). Also, the integrated curriculum encourages experiential and discovery learning within real-world contexts through inquiry and hands-on learning (Beane, 1997; Costley, 2015; Howes et al., 2009; Kim & Aktan, 2014). Thus, supporters claim that learning is more authentic or meaningful to students as it reflects their interests and personal discoveries (Clark, 2011; Costley, 2015; Drăghicescu et al., 2013; Khalil & Kibble, 2014; Russell & Burton, 2000; Russell-Bowie, 2009; Zhbanova et al., 2010).

Additionally, supporters suggest that the integrated curriculum approach encourages reflection and reconceptualization (Merritt, 2008). As mentioned earlier, the curriculum habitually becomes a collaborative process between student and teacher (Costley, 2015; Leung, 2012; Thomas, 2013). As a result, students often experience an increased self- concept (Beane, 1997; Crisan, 2014; Yorks & Follo 1993) because they are more self-directed, independent, self-expressive, and confident (Hooper et al., 2014; Steiner & Posch, 2006; Zhbanova et al., 2010). Hence, they are more likely to take responsibility and ownership for their own learning (Hooper et al., 2014; Russell & Burton, 2000; Steiner & Posch, 2006). The integrated curriculum can also result in higher levels of attendance (Lake, 2000; Parsons & Beauchamp, 2012; Vega, 2013), homework completion (Lake, 2000), participation (Tsinopoulos et al., 2014), performance (Cassese, Holman, Schneider, & Bos, 2015; Khalil & Kibble, 2014), satisfaction with their education (Frazee & Rudnitski, 1995), and positive attitudes towards school and learning (Drake et al., 2015; Lake, 2000; Yorks & Follow, 1993).

Student engagement (Brough, 2012; Cassese et al., 2015; Parker et al., 2012;

Vitulli et al., 2013; Zhbanova et al., 2010) and motivation (Brand & Triplett, 2012; MacMath et al., 2010; Parker et al., 2012; Tong et al., 2014; Zhbanova et al., 2010) can also improve in an integrated curriculum. Intrinsic motivation rather than extrinsic motivation is improved because (as mentioned earlier) students are genuinely interested in what they are learning (Leiman et al., 2015; Zhbanova et al., 2010).

The integrated curriculum is acclaimed by supporters for developing a multitude of skills such as: complex reasoning skills (Parker et al., 2012; Parsons & Beauchamp, 2012), research skills (Wood, 2001), critical thinking skills (Costley, 2015; Kim & Aktan, 2014; Parsons & Beauchamp, 2012; Vitulli et al., 2013), and creative thinking skills (Gullatt, 2008; Khalil & Kibble, 2014; Parsons & Beauchamp, 2012). The integrated curriculum can also advance social skills such as teamwork and leadership due to the focus on cooperative and collaborative work (Lynch et al., 2013; Merritt, 2008; Parsons & Beauchamp, 2012). Finally, it can develop problem-solving skills as students apply the new knowledge from one context to another (Drake et al., 2015; Parsons & Beauchamp, 2012; Russell-Bowie, 2009; Steiner & Posch, 2006; Vega, 2010; Zhbanova et al., 2010).

As noted in the previous section, integration supporters suggest that this approach also aligns with brain research which indicates that students learn best through the use of patterns and connections rather than fragmented concepts (Brand & Triplett, 2012; Kakas, 2010; Vitulli et al., 2013). Integration advocates suggest that thinking, problem solving, and analyzing skills connect the disciplines and need to be focused on and developed before the actual content (Gutloff, 1996; Warwick et al., 1973). They believe that the disciplines must earn their place in the curriculum, not for their content, but for

what they contribute to the acquirement of these learning skills (Warwick et al., 1973). Thus, the integrated curriculum develops process skills (Kim & Aktan, 2014; Merritt, 2008; Thomas, 2013), which are universally applicable, regardless of the content being learned (Thomas, 2013). Consequently, more and more students are enrolling in interdisciplinary programs because they are believed to be a good transition into the workforce (Burton, 2001; Hooper et al., 2014; Parsons & Beauchamp, 2012; Vega, 2013).

Connections Between the Disciplines

The integrated curriculum focuses on the connections or links between the various disciplines to enrich learning rather than assuming students will eventually see for themselves how things fit together. By incorporating various disciplines, students are exposed to a diverse range of perspectives (Cassese et al., 2015; Fenwick et al., 2013; Gullatt, 2008; Mei, 2009; Wong, 2013). These perspectives may naturally enrich their learning of all subjects as they generalize information learned in one discipline area to gain understanding of another (Gerde, Schachter, & Wasik, 2013; Gresnigt et al., 2014; Hovland et al., 2013; Howes et al., 2009; Nompula, 2012).

Thus, in an integrated curriculum, students investigate, analyze, discuss, compare, evaluate, and debate concepts from diverse perspectives (Fenwick et al., 2013; Hooper et al., 2014; Richard & Bennett, 2011). This approach incorporates knowledge, insight, and learning outcomes from various disciplines (Merritt, 2008; Parsons & Beauchamp, 2012) for students to better understand concepts on a multifaceted level (Mei, 2009); that is, supporters also advocate that the integrated approach improves comprehension by looking at a concept from various angles (Cassese et al., 2015; Parsons & Beaucham,

2012; Tong et al., 2014; Vitulli et al., 2013). Students can also retrieve that information faster from their memory because of the multiple connections between concepts that are formed (Lake, 2000). Furthermore, supporters claim that student learning often extends beyond the curriculum standards (Clark, 2011; Roman, 2014; Russell-Bowie, 2009; Thomas, 2013). When students focus on the disciplines alone, it can limit them from knowledge that lies outside of these subject areas (Clark, 2011; Marshall, 2005; Mei, 2009; Parsons & Beauchamp, 2012; Wall & Shankar, 2008).

Supporters also suggest that the integrated curriculum approach provides viewpoints that could contribute to many fields that are currently disregarded in relation to one another (Araki-Metcalfe, 2012; Hooper et al., 2014; Howes et al., 2009; Judson & Sawada, 2000; Marshall, 2005). For example, in clinical studies, learning basic, clinical, and social sciences together would be beneficial for a medical student as these fields are all important and unified in medical occupations (Hooper et al., 2014; Khalil & Kibble, 2014). However, the two disciplines commonly remain separate fields of study (Hooper et al., 2014; Khalil & Kibble, 2014). What is more, subjects such as the arts have the potential to reach and engage students who cannot be engaged in other subject areas (Araki-Metcalfe, 2012; Brewer, 2002; Doyle et al., 2014; Gullat, 2008; Kakas, 2010; Marshall, 200; Nathan, 2008; Trent & Riley, 2009; Vitulli et al., 2013; Winner, 2001; Zwirn & Fusco, 2009). For example, in some low-performing elementary schools, art teachers are being asked to make connections between their curriculum and the disciplines being tested to help raise test scores (Kakas, 2010; Vitulli et al., 2013).

Curriculum integration can better adapt to all learning styles as it interrelates hearing, seeing, speaking, and experiencing from various viewpoints (Gullat, 2008;

Merritt, 2008; Vitulli et al., 2013). It also allows, and even encourages students to apply new ways of communicating and representing new knowledge (National Council of Teachers of English, 2011). Thus, it aims to foster the multiple intelligences presented in an earlier section (Gullat, 2008; Post et al., 1997; Russell-Bowie, 2009). Also, by considering and respecting various perspectives, students are exposed to educative tensions between these perspectives (Marshall, 2005; Stein et al., 2008). As a result, students become aware of the differences, conflicts and even inconsistencies among the disciplines (Marshall, 2005; Stein et al., 2008), which helps them to better understand the knowledge connected to those differences and inconsistencies (Marshall, 2005). Consequently, integration can build consistency and even reduce duplication between the disciplines (Drake et al., 2015). In conclusion, the integrated curriculum approach privileges the diversity of perspectives (Drake et al., 2015; Gullatt, 2008; Richard & Bennett, 2011), which results in a more multifaceted and integrated knowledge base (Brough, 2012; Mei, 2009; Wall & Shankar, 2008).

Furthermore, the "traditional" subjects (the ones being tested) are commonly focused on more than the others, so integrating disciplines can be a way to forefront the neglected disciplines while providing students with a deeper learning experience (Chrysostomou, 2004; Drake et al., 2015; Gresnigt et al., 2014; Gullat, 2008). The supporters are aware of the critics' concerns with preserving the integrity of the separate disciplines (Beane, 1997). However, Beane (1997) refutes this idea in suggesting that there is no integrity in knowledge that does not connect with other forms to help us better understand the problems, issues, and concerns that we routinely face in the real world. Beane also proposes that people naturally learn in an integrated, holistic manner, so a

base foundation is not needed within each separate discipline in order to acquire new knowledge.

Given the many benefits that integrated curriculum can foster, it is no surprise then that the integrated approach has been deemed an effective educational strategy for special needs and at risk youth as well (MacMath et al., 2010; Vega, 2013; Vitulli et al., 2013; Zhbanova et al., 2010). It has also been shown to benefit gifted students because it lends itself to the intensity, intelligence, and complexity of such students (VanTassel-Baska & Wood, 2010; Zhbanova et al., 2010).

Authentic Assessment

Supporters seem to find that integration fosters a contemporary style of assessment that advocates assessment as, of, and for learning (Drake et al., 2015). This form of assessment is beneficial for student learning as it identifies where they are beginning in their learning, how they are doing along the way while receiving feedback, and finally allows them to present new knowledge in the way they feel most comfortable (Clark, 2011; Drake et al., 2015; Nathan, 2008). Moreover, this form of assessment places importance on the process of learning rather than right or wrong answers (Barrette et al., 2010; Clark, 2011; Nathan, 2008; Thomas, 2013).

Teacher Benefits

The integrated curriculum can be highly beneficial for students and teachers alike. To begin with, some teachers have found that adapting an integrated curriculum creates a better learning environment (Burton, 2001; Clark, 2011; Gresnigt et al., 2014; Kim & Aktan, 2014; Wilson, 2011). Teachers are often more relaxed knowing they are not expected to be experts but rather learners who work alongside their students to construct

new knowledge (Clark, 2011; Fenwick et al., 2013; Gullatt, 2008; Richards & Kroeger, 2012). Moreover, students and teachers are brought together as they jointly work toward social and community goals (Beane, 1997; Burton, 2001; Russell & Burton, 2000; Wilson, 2011). Accordingly, it is suggested that students display fewer discipline issues in an integrated curriculum (Brough, 2012; Burton, 2001; Drake, 2012; Lake, 2000; Zhbanova et al., 2010).

The integrated curriculum has the potential to positively impact personal teaching approaches as well as relationships with both students and colleagues (Costley, 2015; Parsons & Beauchamp, 2012). Essentially, teachers learn to communicate better amongst one another to enhance learning (Mei, 2009; Tsinopoulos et al., 2014). Thus, positive collegial relationships are often formed due to sharing of resources and ideas, collaborative planning, team teaching, et cetera (Burton, 2001; Fenwick et al., 2013; Parsons & Beauchamp, 2012). Curriculum integration has the potential to bring entire faculties together to develop relational enhancements among the various activities (Tanner et al., 1992; Tsinopoulos et al., 2014). Additionally, teachers have a network of support in each other, which can be very beneficial and comforting for them (Burton, 2001; Lake, 2000; Mei, 2009; Russell & Burton, 2000; Wall & Shankar, 2008). Team teaching may also alleviate some stress by spreading the workload between a number of teachers rather than just one (Russell & Burton, 2000). Essentially, teachers work together to resolve student problems, analyze work, share lesson plans, identify successes and failures, and learn from each other in a highly professional manner which has very positive effects on both teaching and learning (Burton, 2001; Mei, 2009; Fenwick et al., 2013; Vitulli et al., 2013). Moreover, students also benefit from having a network of

teachers for support rather than just the one at the front of the class (Russell & Burton, 2000; Vitulli et al., 2013).

The integrated curriculum can also improve both student and teacher attitudes (Brough, 2012; Drăghicescu et al., 2013; Drake, 2012; Parsons & Beauchamp, 2012), and thus boost teacher enthusiasm and motivation (Clark, 2011; Gresnigt et al., 2014; Lake, 2000; Parsons & Beauchamp, 2012). It can revitalize teachers' love of teaching and commitment to the profession, which deters burnout and improves feelings of self-efficiency and sense of accomplishment (Clark, 2011; Drake et al., 2015; Gresnigt et al., 2014; Parsons & Beauchamp, 2012). Finally, it is important to note that even though teachers may not feel prepared to take on integrated curriculums in most cases, they do generally have a positive attitude toward integrating curricula and often would prefer it over the traditional approach (Drăghicescu et al., 2013; Gresnigt et al., 2014; Lake, 2000; Parsons & Beauchamp, 2012).

Critics of Curriculum Integration

Those who are against the integrated curriculum approach tend to support the traditional discipline-based curriculum that is universally in place. Critics point out the many benefits of a curriculum design which students, teachers, parents, and administrators are all highly familiar with (Jacobs, 1989; Mei, 2009; Moje, 2008; Taber, 2014). The entire educational system is built around the traditional discipline-based curriculum; textbooks, national standards, admission standards, educational departments, standardized tests, and evaluation reports are all subject specific and the list goes on (Hultén, 2013; Kim & Aktan, 2014; Vars & Beane, 2001; Wall & Shankar, 2008). Thus, revamping the entire educational system requires questioning everything we think we

know about teaching and learning, which is a difficult thought for everyone involved (Clark, 2011; Zhou & Kim, 2010).

Critics point out that a shift from traditional education to an integrated curriculum would require a controversial cultural change (Fenwick et al., 2013; Merritt, 2008; Moje, 2008; Stein et al., 2008), as well as significant structural shifts in the education system (Fenwick et al., 2013; Moje, 2008; Thomas, 2013; Wall & Shankar, 2008). Moreover, the integrated curriculum assumes that all students would prefer this shift to a democratic classroom where they are responsible for their own learning (Wood, 2005). However, many students enjoy the direction, order, and structure of the traditional discipline based curriculum and feel uncomfortable facing an integrated one (Hinde, 2005; Taber, 2014; Wall & Shankar, 2008; Wood, 2005). Teachers may also feel more comfortable with the traditional discipline-based curriculum approach (Crisan, 2014; Lipka et al.,1998; Shankar, 2014).

Critics' areas of concern are categorized into the following groupings: The term is unclear and difficult to replicate; connecting the disciplines; the disciplines are unique and more valuable individually; disciplines as tools for teaching; academic implications; teacher concerns; resources; parent and student concerns; and assessment drawbacks.

The Term is Unclear and Difficult to Replicate

Since integration has been utilized in curriculum design for decades now, one would think that today, integrated curriculums are being implemented and sustained successfully (Burton, 2001; Merritt, 2008). However, critics suggest that the quality of integrated curricula across the world is questionable for several reasons (Burton, 2001). To begin with, curriculum integration lacks universality in terms of theory and

implementation because its definition is unclear and it is so context specific (Hayes, 2010; Russell-Bowie, 2009; Zhou & Kim, 2010) that it cannot be replicated (Drake, 2012; Kim & Aktan, 2014). Consequently, the term is now viewed as an overworked and meaningless word (Russell-Bowie, 2009). Both in-service and pre-service teachers commonly receive very little (if any) training in curriculum integration which makes them ill prepared for implementation (Parker et al., 2012; Wong, 2013; Zhou & Kim, 2010), and providing these teachers with the adequate training for curriculum integration would require the teacher education program to be completely revamped (National Council of Teachers of English, 2011; Zhou & Kim, 2010). Critics also warn that when teachers are trained within a school, the turnover in staff makes it so that the training process is never ending (Zhou & Kim, 2010).

Essentially, teachers are confused as to how to integrate curriculum effectively, which makes them avoid and doubt the approach altogether (Park, 2008; Parker et al., 2012). They view adapting an integrated curriculum as impracticable and theoretically unclear (Lederman & Niess, 1998; Zhbanova et al., 2010; Zhou & Kim, 2010). Thus, they are reluctant to attempt it and their implementation tactics are often problematic (Park, 2008; Parker et al., 2012; Russell & Burton, 2000; Zhbanova et al., 2010; Zhou & Kim, 2010). Critics assure that an integrated curriculum will not be successfully adapted worldwide unless curriculum developers emphasize and lay out specific connections that can be made between the disciplines and how to do so (Park, 2008; Parker et al., 2012).

Connecting the Disciplines

Critics also point out the fact that that scholars, teachers, parents, and students alike disagree on which connections should be highlighted between the disciplines and

how (De Araujo et al., 2013; Lederman & Niess, 1998; Parker et al., 2012; Wall & Shankar, 2008). In many cases, there are profound differences between the disciplines that must be joined in order to attain a high level of curriculum integration, which is not conceivable (Parker et al., 2012). Critics suggest that relationships cannot be drawn between all disciplines so they are forced in an unnatural way (Burton, 2001; Chrysostomou, 2004; Crisan, 2014; Hayes, 2010). Moreover, they suggest that meaningful, apparent, and strong connections are occasional when using an integrated curriculum (Frazee & Rudnitski, 1995; Hinde, 2005; Pang & Good, 2000; Wall & Shankar, 2008). Furthermore, just because the parts of the curriculum are connected does not mean that the entire curriculum is coherent as a whole (Brewer, 2000; Merritt, 2008).

The Disciplines Are Unique and More Valuable Individually

Critics of curriculum integration believe that education should celebrate the diversity, value, and integrity of each discipline separately rather than dissolving or ignoring their boundaries (Gehrke, 1998; Lederman & Niess, 1998; Moje, 2008; Stein et al., 2008). The various disciplines deal with and explain different parts of a problem (which is evident in theme-based models) therefore they should be acknowledged as first independent and then dependent (Gehrke, 1998; Jacobs, 1989; Lederman & Niess, 1998; Zhou & Kim, 2010). That is, the disciplines and concepts within each should first be understood individually then in the context of other situations and subjects. Critics declare that this design claims to be a unified curriculum but it is sometimes more fragmented than discipline-based since it requires students to learn in several subject areas at the same time (Brewer, 2002; Frazee & Rudnitski, 1995; Gehrke, 1998; Zhou & Kim, 2010). Accordingly, curriculum integration often makes it difficult for students to

focus (Burton, 2001; Kim & Aktan, 2014). It also is viewed as an oversimplification of the disciplines as it is just providing bits and pieces (a sampling) from the various disciplines (Gehrke, 1998; Jacobs, 1989; Stein et al., 2008).

Many critics suggest that students need a solid foundation in the disciplines separately first, and then curriculum integration approaches can be introduced in the later years of schooling (Phillips, Bardsley, Bach, & Gibb-Brown, 2009; Warwick et al., 1973; Zhou & Kim, 2010). They suggest that the disciplines are not repositories of knowledge but spaces where knowledge is formed (Moje, 2008). Accordingly, the disciplines have distinctive conventions for creating, representing, connecting, and communicating knowledge and ideas, interactions, challenging contradictory beliefs, and defending ideas (Brewer, 2002; Howes et al., 2009; Lederman & Niess, 1998; Moje,, 2008; Wall & Shankar, 2008). Therefore, an important part of student learning is recognizing that each discipline has its own distinctive way of knowing and learning (Brewer, 2002; Howes et al., 2009; Lederman & Niess, 1998; Moje, 2008; Thomas, 2013) and understanding and adhering to these discipline specific norms (Lederman & Niess, 1998; Marshall, 2005; Moje, 2008). Thus, critics claim that instruction is more effective when it remains within each discipline area (Brewer, 2002; Gehrke, 1998; Lederman & Niess, 1998; Stein et al., 2008; Thomas, 2013).

Using Subsequent Disciplines as Tools for Teaching (Service Connections)

The “less traditional” disciplines (such as art, music, drama, etc.) are often used as tools to justify their usefulness, which results in students never experiencing the individual contributions of each or developing a solid understanding of them (Brewer, 200; Chávez et al., 2015; Chrysostomou, 2004; Winner, 2001; Wong, 2013).

Additionally, when the disciplines are connected in the sense that one subject serves another as a subservient or tool, the relationship between the disciplines are oversimplified (Brewer, 2002; Lederman & Niess, 1998; Zhou & Kim, 2010). This method also dilutes, weakens, trivializes, and undermines the integrity, value, and knowledge of the subservient discipline area (Brewer, 2002; Chávez et al., 2015; Lederman & Niess, 1998; Tanner et al., 1992; Wong, 2013; Zhou & Kim, 2010). Critics also suggest that contrary to what integration advocates believe, one discipline can never become or substitute another, even in full integration (Brewer, 2002). The content matter within the disciplines will always remain separate (Brewer, 2002).

Academic Implications

Critics argue that in an integrated curriculum, students are denied a clear focus on conceptual understandings within the existing foundations (Brewer, 2002; Howes et al., 2009; Lederman & Niess, 1998; Pang & Good, 2000; Wall & Shankar, 2008). Thus, they accuse it of being less sufficient than the traditional discipline-based curriculum (Brewer, 2002; Gehrke, 1998; Lederman & Niess, 1998; Stein et al., 2008). Critics assure that the integrated curriculum is often responsible for superficial and distorted learning, and limited achievement of discipline-based curriculum standards (Hinde, 2005; Kim & Aktan, 2014; Russell-Bowie, 2009; Shankar, 2014; Wong, 2013). They accuse the integrated curriculum of being just a form of critical literacy because it focuses on understanding how knowledge is created in the disciplines instead of building on that knowledge (Hinde, 2005; Moje, 2008). Thus, this approach is accused of lacking content knowledge (Brewer, 2002; Gehrke, 1998; Lederman & Niess, 1998; Stein et al., 2008).

The traditional discipline-based curriculum breaks up the world and knowledge

into efficient delivery parts (the disciplines) appropriate for easier sharing, learning, and comprehension (Hayes, 2010; National Council of Teachers of English, 2011; Parsons & Beauchamp, 2012; Zhou & Kim, 2010). The objectives and standards are clearly laid out for each discipline throughout all grades—especially in secondary school (Jacobs, 1989; Richards & Kroeger, 2012). Moreover, the disciplinary curriculum does not require students and teachers to buy into some centralized concept such as the thematic approaches to integration do (Thomas, 2013).

Additionally, critics accuse curriculum integration of involving a lot of busy work and activities that have no educational value (Clark, 2011; Hinde, 2005; Thomas, 2013). Teachers tend to mistakenly assume that using certain pedagogical approaches such as problem-based learning creates integration; just because these approaches are associated with curriculum integration (Hooper et al., 2014). Critics also indicate that when using discovery- or inquiry-based learning, the learning and validity of the content depends on the situation at hand, outside of that context it takes on a new trivial meaning (Lipka et al., 1998). Accordingly, it is suggested that inquiry-based learning does not provide students with opportunities to learn about profound concepts (Lipka et al., 1998).

Critics further elaborate on this student-centered approach to learning in stating that students cannot be trusted to cover all the important topics that makeup the basics of each discipline because they will likely investigate trivial or flimsy topics (Hayes, 2010; Lipka et al., 1998; Russell-Bowie, 2009; Zhou & Kim, 2010). They need to have non-negotiable requirements (Brough, 2012) or else they will develop poor work habits and attitudes and avoid the discipline areas they find difficult so these skills will never develop (Hayes, 2010). Furthermore, considering the fact that teachers (today more than

ever) are accountable for student learning, for the standards they are teaching (Brough, 2012; Drake, 2012; Russell-Bowie, 2009), this curriculum design can be worrisome. Finally, the integrated curriculum claims that it promotes collaboration between students but they really work in heightened isolation since their learning is catered to whatever they individually want to learn about (Wall & Shankar, 2008).

Teacher Concerns

Critics argue that teachers are justified in adhering to old methods and opposing curriculum integration (Wong, 2013; Zhou & Kim, 2010) because they are hesitant to experiment with children's' lives (Wood, 2001). Thus, critics warn that we avoid changing just for the sake of change (Hinde, 2005; Russell-Bowie, 2009; Warwick et al., 1973). They also argue that forging a collective school philosophy seems highly non-progressive as it dissolves individuality (for both the discipline, student, and teacher) rather than fostering it (Pinar, 2010). Hence, they suggest that forcing this approach on students obscures their creativity and expressivity (Pinar, 2010), and note also that mandates can often hinder the adaptation of curriculum integration as they are commonly categorized according to the disciplines (Frazee & Rudnitski, 1995).

Teachers can feel overwhelmed balancing the various disciplines in an integrated curriculum (Lederman & Niess, 1998; Wall & Shankar, 2008). Secondary teachers are trained in a specific discipline area and have knowledge deficiencies in other areas (Fenwick et al., 2013; Harrell, 2010; Hinde, 2005; Jacobs, 1989, 1991; Thomas, 2013; Yoon et al., 2014). These deficiencies make educators reluctant to integrate because they are afraid of not being able to answer questions or deal with unexpected situations while teaching an unfamiliar subject (Fenwick et al., 2013; Harrell, 2010; Jacobs, 1991; Yoon et al., 2014). Teachers also are highly invested in their professional experiences, training,

and personal security, which urges them to support traditional curriculum approaches (Tanner et al., 1992). These educators (especially specialists) feel as though they are having their professional identities threatened and changed when adapting to an integrated curriculum approach (Harrell, 2010; Jacobs, 1991). They consider their status, comfort, and personal and professional affiliations to be in danger (Fenwick et al., 2013; Jacobs, 1991; Lederman & Niess, 1998).

After elementary school, the disciplines are not only separated metaphorically but physically as well, by departments, faculties, et cetera (Frazee & Rudnitski, 1995; Judson & Sawada, 2000; Mei, 2009; Wall & Shankar, 2008) which intensifies their separation from one another. Integrating curriculums has led to the merging of disciplines into larger departments or faculties (Fenwick et al., 2013; Warwick et al., 1973). This merging has resulted in unease in teachers because their specialty is diluted into a large indistinct grouping (Brewer, 2002; Fenwick et al., 2013; Tanner et al., 1992; Warwick et al., 1973). Thus, critics conclude that having specialists teach subjects they are unknowledgeable in could hinder student learning (Harrell, 2010) while devaluing expertise in favour of the knowledge of the general public (Thomas, 2013).

Critics also capitalize on the fact that integrated curriculums are complex and challenging to organize and implement successfully (Brand & Triplett, 2012; Parker et al., 2012; Pinar, 2010; Stein et al., 2008; Zhou & Kim, 2010). Critics suggest that many teachers lack the ability to be well informed in all discipline areas (Jacobs, 1991; Mei, 2009). Furthermore, critics say that teachers struggle to meet learning objectives because different disciplines require different forms of instruction (Pang & Good, 2000). Hence, they argue that teachers should not be expected to await the development of various connections along premeditated pathways (De Araujo et al., 2013). The approach is

constantly ambiguous and thus unrealistic (Beane, 1997; Wall & Shankar, 2008; Zhou & Kim, 2010).

Furthermore, integrating curricula requires a significant amount of preparation time (Crisan, 2014; Fenwick et al., 2013; Russell & Burton, 2000; Wong, 2013). This can be highly problematic because teachers often have extensive responsibilities outside of school such as families, extracurricular activities, and research and publications (Trent & Riley, 2009; Zhbanova et al., 2010). It is also demanding on school timetabling (Russell & Burton, 2000; Trent & Riley, 2009; Wong, 2013) when there are blocked-out time slots for each subject (Lederman & Niess, 1998; Merritt, 2008); that is, schools are not set up for curriculum integration (Beane, 1997; Wong, 2013). Additionally, funding, staffing, and resources are essential when designing and implementing an integrated curriculum yet they are habitually difficult to obtain due to school budget restrictions (Mei, 2009; Russell & Burton, 2000; Tanner et al., 1992; Thomas, 2013; Wilson, 2011; Wong, 2013). Some critics even feel that interdisciplinary programs should receive less funding than traditional discipline areas because they argue that teachers in interdisciplinary studies are less educated than those with specialized training in specific disciplines (Mei, 2009).

The collaboration of the curriculum between students and teacher may be difficult for some teachers who are unaccustomed to democratic principles because it requires power sharing (Brough, 2012; Howes et al., 2009; Shankar, 2014). For many teachers, giving students more authority would be asking them to completely shift their teaching practice and philosophy (Brough, 2012; Fenwick et al., 2013; Howes et al., 2009). Thus, this approach is problematic because in order for success, the aims of the integration must align with those of the teacher (Gresnigt et al., 2014). Furthermore, it may not be such a

democratic education after all because studies show that students with low socioeconomic statuses receive lower quality forms of curriculum integration (Trent & Riley, 2009) due to lack of resources, staffing, funding, et cetera. Interestingly, even when teachers do succeed, they often become victims of their own success (Wilson, 2011). They implement a successful integrated curriculum, gain attention for it, and then get streamed into other duties such as board positions or administration (Wilson, 2011). Thus, teachers often give up on the integrated program or burn out (Wilson, 2011) seeing as this approach places all responsibility on the teacher should it fail (Gresnigt et al., 2014; Khalil & Kibble, 2014; Kim & Aktan, 2014; Wong, 2013). It is safe to say that teachers become quickly exhausted by the demands of curriculum integration (Pinar, 2010; Wilson, 2011).

Resources

Curriculum integration requires the use of various resources (Beane, 1997; Fenwick et al., 2013; Thomas, 2013). However, the majority of educational resources and materials were created for traditional discipline-based lessons (Kim & Aktan, 2014; Pang & Good, 2000; Trent & Riley, 2009). Consequently, finding high-quality curriculum integration materials and detailed guidance for implementation can be challenging (Fenwick et al., 2013; Kim & Atkan, 2014; Parker et al., 2012; Thomas, 2013). Critics also emphasize that effectively integrated curricula have community and administrative support and direction, which can also be quite difficult for teachers to obtain (Kim & Aktan, 2014; Tanner et al., 1992; Wall & Shankar, 2008; Wong, 2013.

Difficulties When Collaborating With Colleagues

Curriculum integration may require constant staff collaboration, which can be problematic due to incompatible views and personalities (Crisan, 2014; Pang & Good,

2000; Parsons & Beauchamp, 2012; Wall & Shankar, 2008). Everyone involved needs to be on board with the objectives, aims, and aspirations of the integrated unit or it will not flourish (Lake, 2000; Pang & Good, 2000; Parsons & Beauchamp, 2012; Wall & Shankar, 2008; Warwick et al., 1973). However, forcing conflicting colleagues to create a united curriculum causes interpersonal tensions and imbalances in the curriculum that compromise its effectiveness, not to mention teacher happiness (Lederman & Niess, 1998; Stein et al., 2008; Wall & Shankar, 2008). Teachers who are more withdrawn also feel as though they are giving up all their control (Brough, 2012) because others tend to overpower them in group discussions (Beane, 1997; Shankar, 2014). Thus, the quiet teacher voices do not get valued in this approach.

Teachers need time to plan together, which would have to be in an organized or scheduled manner which has shown to be difficult due to scheduling conflicts (Tanner et al., 1992; Trent & Riley, 2009; Wall & Shankar, 2008; Wong, 2013). Teachers also complain about unequal workloads (Tanner et al., 1992; Wall & Shankar, 2008) and professional and philosophical differences between colleagues (Stein et al., 2008; Tanner et al., 1992; Tsinopoulos et al., 2014). They also believe that team teaching can undermine their relationship with their students because the students have multiple authority figures rather than just one (Russell & Burton, 2000).

Parent and Student Apprehensions

Some parents and students are also reluctant to partake in an integrated curriculum because they fear it will jeopardize student academic futures (Beane, 1997; Park, 2008; Wall & Shankar, 2008; Zhou & Kim, 2010). Parents worry that their children are not going to be academically challenged or experience a curriculum centered on factual knowledge (Frazee & Rudnitski, 1995). They also worry that highly esteemed

colleges will not value an integrated curriculum approach as much as they would a traditional one (Frazee & Rudnitski, 1995; Lipka et al., 1998; Wall & Shankar, 2008). Likewise, student priorities often correspond to becoming an expert in a certain subject area because acquiring expertise in a major is what they have been taught to strive for (Thomas, 2013). Thus, critics suggest that curriculum integration has a bad reputation (Russell & Burton, 2000). Integrated programs are considered to essentially allow students to have fun and do whatever they want (Hayes, 2010; Russell & Burton, 2000). Hence, critics believe that curriculum integration has lowered academic standards (Frazee & Rudnitski, 1995; Wall & Shankar, 2008; Wong, 2013; Zhou & Kim, 2010) and placed value on lack of structure (Burton, 2001; Marshall, 2005). Critics claim that the existing structure of the various disciplines are connected and ordered for coherence (Marshall, 2005), which is why curriculum integration is less effective.

Assessment Weaknesses

In order to achieve integration, the curriculum, pedagogy, and assessment all need to be aligned (Gresnigt et al., 2014; Parker et al., 2012; Taber, 2014). However, assessment is difficult because even if the teacher marks holistically, the evaluation scores must be broken into the various disciplines because that's the way the system is currently set up (Drake, 2012; Lynch et al., 2013; Zhbanova et al., 2010; Zhou & Kim, 2010). Hence, the integrated curriculum cannot easily align evaluation tactics because assigning letter or number grades is not very progressive in practice (Clark, 2011). Accordingly, critics wonder how well students from integrated curricula will do on standardized achievement tests which focus exclusively on recall of information (Beane, 1997; Frazee & Rudnitski, 1995; Richards & Kroeger, 2012; Thomas, 2013). Critics also wonder how schools will determine the efficiency of the integrated curriculum shift if

standardized tests cannot adequately measure the learning (as integration supporters suggest) (Gresnigt et al., 2014). They claim that integration supporters need to be able to show that progress is being made to justify the use of this design (Gresnigt et al., 2014).

Integration Suggestions

There are different degrees, extents, and styles of curriculum integration. Regardless, this approach can be applied to all content areas and grade ranges (Merritt, 2008**).** The integrated disciplines must work together, support each other, and reinforce student learning in any school setting (Merritt, 2008). The following suggestions fall within these subheadings: mixed approach; pedagogy suggestions; assessment advice; teacher collaboration recommendations; helpful resources; and integration context**.**

Mixed Approach: **Both Discipline-Based and Integrated**

A student-centered curriculum such as the one advocated in this method is ideal to many scholars and educators alike, however the organization of the current educational system makes implementation attempts nearly impossible (Consortium of National Arts Education Associations, 2002; Roman, 2014; Wraga, 1997). Thus, in order for integration to be effective and successful, educational structures must change (Fenwick et al., 2013; Merritt, 2008; Moje, 2008; Stein et al., 2008). For example, timetables are blocked out for each discipline, teachers are physically confined to classrooms, and learning is quantified using numbers and letters (Moje, 2008). Scholars recognize that reforming these educational structures would require an educational revolution, so many advocate for a mixed approach—both discipline-based and integrated (Hinde, 2005; Russell-Bowie, 2009; Taber, 2014; Zhou & Kim, 2010). Of course, there are various descriptions of what this should look like. Nonetheless, successfully moving from a traditional

discipline-based education to an integrated one requires gradual changes in schools rather than an abrupt transformation (Fenwick et al., 2013; Lake, 2000; Virtue et al., 2009).

Those who advocate a mixed approach suggest that students should have a range of curriculum experiences that reflect both disciplinary and interdisciplinary orientations. They believe that integrating curriculum does not mean that the disciplines should be abandoned altogether; teachers simply need to find the big ideas or big concepts within them and place them in personally significant circumstances (Beane, 1997; Drake, 2012; Jacobs, 1989). Many scholars and educators alike believe that students need a solid base knowledge in each of the disciplines to give way to integration and that they need a certain amount of direction for optimal learning (Phillips et al., 2009; Warwick et al., 1973; Zhou & Kim, 2010). Accordingly, the curriculum needs a balanced approach where disciplines are integrated but do not undermine or threaten the less traditional subjects (Chrysostomou, 2004; Consortium of National Arts Education Associations, 2002; Hinde, 2005; Merritt, 2008; Taber, 2014). Mixed-approach supporters believe that if teachers highlight the common ground between the disciplines, they can address learning goals in both disciplines without compromising the integrity of one or the other (Khalil & Kibble, 2014; Merritt, 2008).

Pedagogy Suggestions

Scholars and educators alike tend to provide similar guidelines and suggestions for teachers when designing and implementing an integrated curriculum. To begin with, there needs to be competent, confident teachers who have appropriate subject knowledge for all disciplines (Park, 2008; Taber, 2014; Wood, 2001) and integration training (Consortium of National Arts Education Associations, 2002; Hinde, 2005; Roman, 2014;

Vitulli et al., 2013). Moreover, teachers need to look beyond content knowledge to how students will apply the new knowledge in their own lives (Brand & Triplett, 2012; Costley, 2015; Merritt, 2008; Wraga, 2009). It is not necessary to give up on the content areas but rather teach them in relation to one another and in relation to new topics and ideas that are always developing (Tanner et al., 1992). Educators are required to identify themselves as teachers first and subject specialists second (Fenwick et al., 2013). When teachers have a sense of favouritism and/or supremacy over a subject, it can hinder the equality of integration. Moreover, teachers must engage students with subject matter that is stimulating, meaningful, and reflective of social objectives (Wraga, 1997; Roman, 2014; Russell-Bowie, 2009). The design of the curriculum must answer student questions, address their concerns, and show them how to acquire and demonstrate new knowledge in the real world (Brough, 2012; Costley, 2015; Drăghicescu et al., 2013; Parsons & Beauchamp, 2012; Wood, 2005). Learning should be relevant to students' previous experiences and interests (Costley, 2015; Russell-Bowie, 2009; Wraga, 2009). Hence, teachers must get involved in student interests and lives in order to shape their curriculum accordingly (Merritt, 2008; Vega, 2013; Russell-Bowie, 2009; Vega, 2013; Wood, 2005). Moreover, this is the only way to accommodate the diversity of students today (Consortium of National Arts Education Associations, 2002; Khalil & Kibble, 2014; Merritt, 2008; Taber, 2014).

Furthermore, teachers are encouraged to care about the whole well-being of the child (Drăghicescu et al., 2013; Zhou & Kim, 2010) and create a nurturing, holistic classroom environment (Wall & Shankar, 2008). To do this, they must shift their position of power so that their students are given more authority (Brough, 2012; Howes et al.,

2009; Post et al., 1997; Shankar, 2014); that is, the students should be given a voice in the classroom and more ownership over their learning (Alberta Education, 2012; Drăghicescu et al., 2013). Therefore, it is important that students have a clear understanding of the goals of the curriculum so they know what is expected of them (Khalil & Kibble, 2014). The integrated curriculum should also develop students' values, attitudes, and beliefs, while encouraging questioning and critical thinking (Drake, 2012; Post et al., 1997) for them to flourish in the 21st century (Costley, 2015; Drăghicescu et al., 2013; Drake, 2012). Accordingly, there must be a focus on developing and utilizing skills (such as problem-solving) that will be beneficial for years to come (Brand & Triplett, 2012; Costley, 2015; Hinde, 2005; Roman, 2014). Finally, teachers must use purposive activities (Drăghicescu et al., 2013; Hinde, 2005; Wraga, 1997). Some scholars suggest that experiential, service, problem-based, and collaborative learning are the most efficient pedagogical strategies to use when integrating because they focus on skill development (Hooper et al., 2014; Parsons & Beauchamp, 2012). Teachers must be prepared with good classroom management strategies because so much of the learning is inquiry-based (Parsons & Beauchamp, 2012) and collaborative (Wood, 2001).

The integrated curriculum requires innovation and creativity from teachers (Drăghicescu et al., 2013). Teachers must be motivated and passionate about the new design and implementation in order for students to succeed in it (Fenwick et al., 2013; Post et al., 1997; Wall & Shankar, 2008). For many teachers, the integrated curriculum requires them to reevaluate their views on learning, thinking, content, student engagement, and sometimes collaborative planning with their colleagues (Consortium of National Arts Education Associations, 2002). Thus, they need extensive preparation time

(Crisan, 2014; Fenwick et al., 2013; Russell & Burton, 2000; Wong, 2013). They also need to reevaluate and revise their curriculum design while it is being implemented to cater to student needs (Costley, 2015; Parsons & Beauchamp, 2012). Teachers should also encourage their students to engage in consistent reflection to support deep learning (Parsons & Beauchamp, 2012; Richard & Bennett, 2011).

Most importantly, the connections made between the disciplines need to be meaningful, relevant, natural, and active (Brand & Triplett, 2012; Burton, 2001; Drake, 2012; Jacobs, 1989). The connections must recognize the relationships that exist in the application of the concepts found across the various disciplines (Brand & Triplett, 2012; Costley, 2015; Fogarty, 1991; Merritt, 2008). That is, connections between the disciplines should extend beyond simply linking concepts or topics (Brand & Triplett, 2012; Brough, 2012). They need to represent the connections in the schemas and tools that students use when they process new ideas (Brand & Triplett, 2012; Brough, 2012). This is how students transform facts into actual applicable information (Brand & Triplett, 2012). Moreover, although highly debated (as previously addressed), many scholars suggest that artistic subjects such as art and music can be used as outlets for learning in other disciplines (Araki-Metcalfe, 2012; Brewer, 2002; Doyle et al., 2014; Gullatt, 2008; Kakas, 2010; Marshall, 2005; Nathan, 2008; Trent & Riley, 2009; Vitulli et al., 2013; Winner, 2001; Zwirn & Fusco, 2009).

Jacobs (1989) suggests a thematic approach where teachers center the disciplines on a topic or theme, establish guiding questions to function as a scope and sequence and then design activities for implementation. Some scholars advise however that the knowledge, skills, and understandings of each discipline are not distorted for the sake of a

theme (Russell-Bowie, 2009). Rather, it should be investigated from all the discipline areas to reach a deeper, more holistic understanding of the concept (Burton, 2001; Russell-Bowie, 2009). Additionally, teachers who are not using this thematic approach still need to decide the scope and level of integration in the designing process (Costley, 2015; Parsons & Beauchamp, 2012).

Drake (2012) provides detailed instructions for utilizing the design-down approach to integrate curricula. The first step is to establish the big picture or the big ideas that students need to know across all disciplines (horizontal mapping) from K-12 (vertical mapping) (Costley, 2015; Drake, 2012; Fogarty, 1991). This big picture reflects the core purpose of the curriculum and transcends all discipline areas, providing the curriculum framework (Drake, 2012). From there, teachers identify from the curriculum standards what students will need to know, do, and be in relation to the established framework (Drake, 2012). Focusing student learning on big ideas is essential because these enduring understandings are broad, abstract, and universal in application and transcend all disciplines and cultures (Drake, 2012). Horizontal mapping is also important because it looks at the curriculum standards within each discipline and within a specific grade level (Costley, 2015; Drake, 2012; Fogarty, 1991; Warwick et al., 1973). Vertical mapping is just as significant because it shows teachers how the standards, content, and skills within each discipline are connected and scaffold from year to year (Costley, 2015; Drake, 2012; Fogarty, 1991). Thus, curriculum mapping often results in a deeper understanding of the curriculum standards and how to use them to develop higher order thinking (Drake, 2012). Also, a “Know, Do, Be” umbrella along with guiding questions can be created as a result of the vertical and horizontal mapping to guide all

subsequent planning (Drake, 2012). Teachers must teach and assess all that they include under their KDB umbrella (Drake, 2012). Finally, teachers are to design a rich culminating project for students to communicate their new learning (Drake, 2012). Students are then provided with creative options for communicating or demonstrating this new knowledge (Parsons & Beauchamp, 2012).

Empirical Intervention Studies Regarding Integrated Curriculum

The empirical literature evaluating the degree of teacher education training for curriculum integration is fairly limited. Yet, for the purpose of this study, only research that explores the effectiveness of curriculum integration and emphasizes the need for teacher development programs and guidance will be included in this section to stress their importance and the need for their development. To begin with, the most well-known study in curriculum integration is discussed: The Eight-Year Study.

The Eight-Year Study

The Eight-Year Study of the 1930s "still stands today as the most comprehensive, long-range, experimental educational research study ever conducted in school settings, and its lessons are many and as pertinent today as they ever were" (Lipka et al., 1998, p. 15). It is arguably one of the most important school-based curriculum research projects in the history of American curriculum studies (Brough, 2012; Lipka et al., 1998; Pinar, 2010). The Eight-Year Study investigated the impact that integrated curriculums have on student learning in secondary schools (Drake et al., 2015). A follow-up study then examined the success of these students in university settings (Drake et al., 2015; Lipka et al., 1998). The study aimed to contest that schools did not work the way they were conceptualized at the time by suggesting they did not adequately prepare students for university (Drake et al.; Lipka et al., 1998). It also sought to facilitate democratic

communities, curriculum coherence, and modern programming that was receptive to student needs (Kridel & Bollough, 2007; Pinar, 2010).

The Progressive Education Association appointed the Commission on the Relation of School and College (CRSC) in the fall of 1930 (Hinde, 2005; Pinar, 2010). The twenty-eight members reflected all phases of secondary and higher education (Lipka et al., 1998). They were given the massive task of restructuring secondary schools in the United States (Lipka et al., 1998). Thus, they analyzed the conditions of secondary schools and after a year, released a report that found 18 areas inadequate for optimal learning conditions (Lipka et al., 1998). To name a few concerns, they noted that the current education system seldom allowed student creativity, it was far removed from real-world concerns, the disciplines had lost their vitality and significance, and the curriculum lacked unity and continuity (Lipka et al., 1998). Teachers and students alike were also dissatisfied with the college preparatory program and separate subject learning (Lipka et al., 1998; Wraga, 1997). Thus, at this time, schooling was considered ineffective in regards to student learning and this study hoped to have found the solution (Drake et al., 2015; Lipka et al., 1998; Wraga, 1997). In the late 1930s, The Eight-Year Study commenced in 30 secondary schools throughout the United States (Drake et al., 2015; Pinar, 2010). The study attempted to motivate secondary schools to develop modern programs that better catered to student needs (Lipka et al., 1998).

These 30 schools were expected to adapt a wide range of approaches that were all founded on progressive principals (Drake et al., 2015). Yet, only about six schools integrated the curriculum in one way or another (Drake et al., 2015). They followed two principles: (a) “teachers were to apply the teaching and learning principles as represented by the progressive movement. The lessons needed to be personally meaningful and

involve the whole person; and (b) "students needed to learn the skills to be citizens in a democratic society" (Drake et al., 2015, p. 12). Although the valuable content of the traditional courses was preserved, students experienced a departure from the traditional content (Lipka et al., 1998). They were encouraged to learn through more exploratory and investigative approaches (Lipka et al., 1998).

Some of the schools utilized student career interests and common tribulations of American youth as unifying focuses for student learning (Lipka et al., 1998). Hence, the styles and approaches to integration varied from school to school (Beane, 1997; Drake, 2012; Lipka et al., 1998; Wraga, 1997). Teacher and student relationships also changed to a more democratic association (Costley, 2015; Lipka et al., 1998; Pinar, 2010). Teachers were no longer the all-knowing authority figures as the curriculum was co-constructed from student concerns and interests (Kridel & Bollough, 2007; Lipka et al., 1998). Furthermore, the schools adopted new approaches to evaluation, which sought to appraise and record student progress (Lipka et al., 1998; Pinar, 2010). Finally, some teachers were found to be more collaborative with their colleagues as they provided support for one another (Kridel & Bollough, 2007; Lipka et al., 1998).

Overall, the results of the study indicated that the students from all 30 schools performed as well as, or better than, their peers in the comparison group (Brough, 2012; Drake et al., 2015; Hinde, 2005; Lipka et al., 1998). This held true for all measures of academics (Drake et al., 2015). Moreover, the students outperformed their peers on developmental traits such as resourcefulness, time management, problem solving, intellectual inquisitiveness, determination, and active concern for real world issues (Drake et al., 2015; Lipka et al., 1998). Students were more systematic, precise, and objective in their thinking as well (Lipka et al., 1998). It is also important to note that the

schools with the most experimental programs utilized interdisciplinary curriculum as a key characteristic, and were the most successful schools in the entire study (Drake et al., 2015). Thus, integration advocates believe that this study from the 1930s reveals the value of the integrated curriculum approach when it comes to student learning (Drake et al., 2015).

Yet, like many large-scale studies, this one is considered to have some flaws (Lipka et al., 1998). To begin with, the study commenced before provisions were made for many contingencies (Lipka et al., 1998). Moreover, assistance to the faculties was often limited and late (Lipka et al., 1998). Furthermore, during the study, the schools had difficulties making major changes in the routines and rituals of conventional structures (Lipka et al., 1998). Yet, Lipka et al. (1998) recognize the undeniable validity in the general findings of the Eight-Year Study. Also, the findings were reported in 1940 and the study was published in 1942 (Lipka et al., 1998). By this time, the United States was actively at war on two remote fronts (Lipka et al., 1998). Thus, from an educational standpoint the timing of these findings could not have come out at a worse time (Lipka et al., 1998). Citizens around the world were part of an international war and school reform efforts merely could not compete with these events (Lipka et al., 1998). Accordingly, many scholars and educators alike argue that the impact of the Eight-Year Study was erroneously marginal (Lipka et al., 1998).

Additional Studies

These studies are arranged under subheadings titled; Impact of Integration and The Need for Guidance and Teacher Development Programs, as all of the subsequent empirical studies fall under one of the two categories. The impact of integration is examined in this chapter to justify the pedagogical use of curriculum integration and

therefore teacher training programs.

Impact of Integration

First and foremost, Wayne Wrightstone (1935) conducted a study over 70 years ago to examine the extent to which integrated curriculums affect student achievement. Wrightstone's study examined the effectiveness of "standard-type" or discipline-based verses "new-type" or integrated curriculum approaches. The participants first completed the National Intelligence Test to ensure equivalence, then the New Stanford Achievement Tests, Form W, in reading, language, and arithmetic (Wrightstone, 1935, pp. 585-86). Results found that students in the new-type schools were marginally superior in some achievement areas but for the most part, no essential differences were found (Wrightstone, 1935). There was a total of 108 fourth, fifth, and sixth grade pupils from diverse schools tabulated in the results, for a sampling that Wrightstone deemed "too small to permit the formulation of final conclusions" (p. 587). Thus, this study functioned as somewhat of a starting point for future integration research.

Kakas (2010) conducted a research project in which she and a sixth-grade teacher collaboratively designed and implemented an integrated curriculum. The school was located in a primarily nonwhite, low income, urban neighbourhood where test scores were among the lowest in the district. Kakas explored utilizing the arts in order to have students better comprehend the social studies curriculum. She adapted a method reflective of the thematic and service connection modes of integration as she used drawing as well as other hands-on activities to explore certain social studies topics (Kakas, 2010). She found that these students ended up scoring much higher on the Ohio standardized tests that spring while respectfully pointing out that many variables can affect student learning (Kakas, 2010). Her study concluded by affirming that the sixth-

grade students were much more motivated and interested to learn when given hands-on art activities, grounded in social studies matters (Kakas, 2010). She also states that meaningful learning can take place using the cross-disciplinary mode of integration without diluting or devaluing either subject (Kakas, 2010). However, she warns that ample time and teacher collaboration is required to do so (Kakas, 2010). Hence, time management and peer collaboration are aspects of curriculum integration that should be addressed in teacher training programs.

Yoon et al. (2014) investigated the impact of an integrated science, technology, and engineering (STE) education on student content knowledge and views on engineering. From 2009 to 2010, 59 elementary teachers attended a week-long engineering teacher professional development program. This program showed them how to discuss and approach engineering from all angles and to integrate it into scientific concepts. Accordingly, in the same year, these 59 teachers implemented STE lessons.

In the South Central U.S. school district, Student Knowledge tests and the Engineering Identity Development Scale were administered to 831 students in grades 2 through 4. These tests were completed both before and after only some of these students participated in the STE curriculum. The ones who did not participate in STE acted as the control group. Results indicate that regardless of grade, the students excelled in dissimilar subject areas. Moreover, the treatment group showed significant content knowledge differences on the Student Knowledge Tests but their perceptions of themselves academically did not differ from the control group. Furthermore, the students in the treatment group showed higher engineering career identity than the control group. The authors believe that this study shows promise for future STE integration and consequently the use of teacher integration training as well.

Engin and Uygun (2014) examined a study which sought to identify the effectiveness of an integrated curriculum approach in regards to the development of student values. Seventh grade Physical Education and Language Arts curriculum standards that relate to "the values about cognitive behaviors, affective characteristics and value display levels" are integrated in this program (Engin & Uygun, 2014). Research took place in a state school in Turkey from 2013 to 2014 for 13 weeks. There was an experimental group who received an integrated values education program and a control group who did not participate in any programs. Data was collected by means of pre and post open-ended question forms and standard democratic values scales. Observations were also gathered during the implementation of the program. The results indicated that "value- related cognitive behavior acquisition levels and value display levels were found to be significantly higher than the control group" (Engin & Uygun, 2014, p. 942). Thus, this integrated curriculum program can effectively develop student values. The authors argue that addressing student values and encouraging social responsibility during puberty is critical as this is when students begin to understand and evaluate abstract concepts. Thus, this study reveals the significant impact that curriculum integration can have on students as well as the importance of integrating appropriately.

Kim and Aktan (2014) investigated whether integrating mathematics into science improves student learning or complicates their understanding. This study offers a theoretical model for curriculum integration of mathematics and science while identifying expert opinions on its educational benefits and drawbacks. The integration model utilized a webbed approach with mathematics located at the center of all lessons and science "placed to develop the meaningful understanding of mathematics" (Kim & Aktan, 2014, p. 459). University, high school, and elementary teachers made up the 54 participants

who completed and returned the open-ended surveys. The results suggest that this form of curriculum integration is unlikely to cause negative attitudes towards mathematics, to prevent abstract thinking, and to foster irrelevant learning. The responses indicate that math-science integration improves mathematics education motivationally, pedagogically, and societally. However, this approach provides challenges for teachers such as curricula connection making, finding facilities and resources for effective implementation, and time constraints. Finally, the success of the curriculum is found to be dependent upon innovative redesign. Kim and Aktan (2014) end the discussion by claiming that more integrated curriculums need to be designed and implemented in experimental studies to evaluate the motivational, pedagogical, and societal needs they fulfill.

Another study by Zwirn and Fusco (2009) investigated the efficiency of an integrated curriculum in a university setting. They taught a group of pre- and in-service teachers at Hofstra University (Zwirn & Fusco, 2009). The teachers were both graduates and undergraduates with varying teaching roles outside of school. Zwirn and Fusco (2009) took them to Sorrento, Italy for interdisciplinary courses in both art and literacy education. The culminating project brought the students from both courses together to create a shadow theater play and performance. Thus, they experienced learning as the students in their classes would. Moreover, Zwirn and Fusco (2009) discuss the ways in which folktales, readers' theatre, and shadow theatre were incorporated into the courses as a means to develop literacy skills. After reading their students' reflections on this experience, the authors declare that the cross-disciplinary approach, particularly art and literature used simultaneously, is powerful. They suggest it is easier to remain engaged and master literacy skills and content when learning through art. Thus, Zwirn and Fusco (2009) state that art and literacy can be naturally integrated as much of the knowledge

gained in art strengthens and reaffirms the concepts that are significant to literacy.

Tsinopoulos et al., (2014) conducted a study to examine the effect of integrating medical teaching in ophthalmic training. Traditionally, medical students are taught content with little or no reference to clinical significance. It took the Medical School of the Aristotle University of Thessaloniki 8 academic years to make the changes in content matter, lecture structure, and materials towards an integrated program. Over these 9 years, data was collected by means of structured questionnaires and a comparison of examination scores. From 2010-2013, the program was considered fully integrated thus these scores are compared to scores of the 6 years prior to this implementation. Results indicate that final examination scores increased significantly after the integrated model was adopted. Moreover, students were much more satisfied with their education when compared to previous academic years. Student participation also increased as well as the amount of correct diagnoses made by students. Thus, the authors conclude that integrating the curriculum in medical education could have serious benefits that need to be explored further.

Tong et al. (2014) conduct a study that seeks to identify the value of an integrated curriculum design to enhance English language learners' (ELLs) education. They wanted to see the effect (if any) that this approach had on the science and literacy achievement of 58 Hispanic English Language learners. The study took place in an urban school district in Southeast Texas, United States. Two interventions were implemented: in grade 5, science instruction was embedded into literacy lessons and then from kindergarten to grade 3, English was embedded into science instruction. The study was longitudinal and followed the same group of students from kindergarten until the end of grade 5. The students who participated in the interventions were compared to those who did not. The

Benchmark Science Test 6, and the State Standardized Test- TAKS, English Oral and Literacy were all used to quantify student learning and determine the impact of the interventions. Results revealed that "the science intervention treatment ELLs outperformed their counterparts in English-reading fluency, knowledge of word meaning, and science and reading achievement" and "in the language/reading intervention treatment ELLs continued to develop faster than their peers in English oral, reading fluency, and comprehension" (Tong et al., 2014, p. 421). Thus, the authors conclude that for ELLs, primary grades should focus on reading when integrating language with science in grade 5. Consequently, this study not only justifies the use of curriculum integration and thus teacher training but the idea of gearing this integration and training toward English Language learners.

Russell-Bowie (2009) discusses a study known as the Community Harmony Project: Real-Life Syntegrated Creative Arts Project. Students were given the opportunity to "explore their role in the community through the creative arts and learn how they could use the arts to promote harmony within that community (p. 10). Russell-Bowie (2009) wanted to determine the impact that the Community Harmony Project has on student academic achievement as well as respectful conduct, generic skills, and self-expression. Over a course of 5 months, 18 students participated in a variety of visual arts learning experiences centered on the theme of "My Community: The Power of Story" (Russell-Bowie, 2009, p. 12). The results of this study were based upon teacher, principal, and any other classroom support interviews. The results illustrate that these students had attained distinct outcomes in all of the art forms: music, visual arts, drama, and dance. These students showed enhanced generic skills such as leadership, respect for self and others, and self-expression. However, academic achievement in subject areas outside of the arts

was not observed.

The integration improved student attitudes toward school and engagement in learning, which should have a positive influence on overall academic achievement in school. Students also developed transferable life and communication skills as well as self-confidence and self-esteem through this form of learning. It makes learning more meaningful and deep as content is put into authentic real-life contexts. Russell-Bowie (2009) suggests that this study justifies the integration of the arts in curriculum design. This study also indicates the importance of thoughtful integration as student leadership and social skills as well as attitudes and engagement were affected.

Russell and Burton (2000) conducted a study that explored the effectiveness of an integrated curriculum program grounded in environmental issues. They examined an environmental program that had begun 3 years prior with a total of 22 to 26 participants. The primary sources of data were pre- and post program questionnaires given to students along with observations, and student journals. The program is grounded in authentic, holism, real-world experiences, disciplinary connections, collaboration, responsibility, and a sense of community. The study sought to improve teacher–student relationships. Results indicate that students found learning outdoors easier, more effective, meaningful, authentic, and relevant to their lives. Furthermore, students developed interpersonal skills as well as personal growth. The students reported improvements in self-awareness, trust, patience, teamwork skills, self-confidence, and even physical fitness. Thus, the authors conclude that the grouping of disciplines is much less important than providing students with opportunities to inquire, explore, and learn for themselves. Yet, they still advocate for a "truly interdisciplinary" program over a traditional discipline-based education (Russell & Burton, 2000, p. 299).

Doyle et al.'s (2014) study illustrated the effect that an art integration program has on student learning. CoTA (Collaborations: Teachers and Artists) is a professional development program where teachers learn how to integrate the arts into routine instruction to enhance student achievement. The goal of this program is to improve student abilities by utilizing the arts as a sort of tool for understanding and communicating knowledge in other discipline areas such as language arts and/or math. CoTA requires that "each teacher work directly with a CoTA teaching artist for a 10-week period of sustained, intense professional development each year" (Doyle et al., 2014, p. 6. An evaluation survey was given to teachers at the beginning and end of the 10-week professional development sessions. Results found that upon completing the program, teachers had less difficulty demonstrating and describing how arts standards can be implemented into their lessons and projects. Moreover, these teachers were aware of their development and showed more confidence and probability in integrating the arts. Furthermore, these teachers reported that their students were much more excited, motivated, and focused on their learning. Their social skills and confidence levels progressed as well. Thus, the authors' final comments suggest that the benefits of CoTA programs or similar strategies have beneficial outcomes for both teachers and students that should be broadly embraced.

Finn and McInnis (2014) point to the fact that educational recommendations worldwide suggest that schools integrate physical activity into other discipline areas in order to teach concepts through movement. Accordingly, their study aims to analyze teacher and student perceptions of an integrated science and physical education curriculum to determine its value and feasibility as a middle school program. The program under investigation is called Active-Science; it includes technologies that

promote exercise and movement while learning science concepts. Two science teachers and 47 fifth- and sixth-grade female students participated in the study at hand. Teacher and student responses were assessed using individual interviews with two service teachers, written questionnaires for the students, and a focus group interview with a sample of eight students. Results found that students enjoyed the integration of physical activity and it helped them to stay engaged and motivated in class. The students also felt as though it helped them to learn the science content better. Teachers affirmed this by reporting that the Active Science curriculum undoubtedly helped the students improve their science content knowledge and inquiry skills. Furthermore, teachers declared that it is feasible to include physical activity into other discipline areas. Thus, the authors recommend integrative programs such as Active Science be used as a model to branch into other academic disciplines. Moreover, programs that train teachers for integration would help achieve this recommendation.

Parker et al. (2012) guide a small-scale study which examines post graduate student teachers' perceptions of cross-curricular approaches to designing, implementing, and representing the primary curriculum. To begin with, the study gave questionnaires to 118 postgraduates of the education program who were participating in the 1-year teacher-training course for primary education. The results of this questionnaire revealed that although over 90% of students had a positive view of curriculum integration, only 14% declared to have had considerable experience with the approach. Accordingly, Parker et al. (2012) then conducted a study with a focus group of 10 participants who were in the early stages of teacher training. In their first term, the participants were required to attend a 3-hour university class in which science and art were combined. The study included three stages: a pre cross-curricular session questionnaire, participation in a cross-

curricular course in art and science, and a post-CCS small group discussion. The cross-curricular course was an attempt by the authors to encompass the interdisciplinary element and show them how two subjects can simultaneously provide deeper insight into concepts.

The results of the study rely on empirical evidence gathered from the questionnaires and the observations from group discussions. They reveal that integrating science and art was a stimulating and positive experience that successfully developed student knowledge in both disciplines. Moreover, the teachers felt as though the unifying theme was imperative for meaningful learning. Some reported that it was a much more natural, holistic, and relevant way to learn. Furthermore, art was commonly viewed as a sort of tool for teaching science concepts. However, five of the 10 teachers stated that they believe subject matter needs to be taught separately and expressed concern over reaching all of the curriculum objectives expected of them using this approach. Finally, many teachers were uncomfortable with finding the best way to make meaningful connections between the disciplines. The implications for these findings are numerous. Most importantly, the study points to the need for teacher curriculum integration training in order to cover all of the curriculum standards, increase comfort levels, and guide connection making among the subjects.

Brand and Triplett (2012) are interested in the pedagogical practices of former pre-service teachers in their first years of teaching. During their training, these pre-service teachers were taught how to "identify contexts implied within the content, conceptualize connections and relationships, and to organize the curriculum into meaningful chunks" in order to foster deep learning (Brand & Triplett, 2012, p.382). Accordingly, this study sought to determine whether these teachers were continuing to

meaningfully chunk their disciplines upon graduation and if they were, how this strategy influences student learning. The data were collected by means of a survey with five open-ended questions. Twenty-five out of 40 former pre-service teachers completed the survey. The data discloses that most of these first-year teachers could only make connections between two disciplines. Nonetheless, they report that this approach helps their students understand concepts quicker and that these cross-curricular links help to strengthen understandings. The students also recalled, retained, transferred, and communicated new knowledge much easier when doing it through cross-curricular means. Students also displayed happiness, excitement, motivation, and interest when participating in the integrated curriculum. However, this study also indicated the challenges many teachers faced when integrating such as time constraints, lack of resources, state and local mandates, and predicaments related to being a first-year teacher. Many teachers also commented on the issue of accountability and testing constraints. Yet, teachers reported that collaboration put them at ease and was a great support system. The authors of this study conclude by stating that the findings point to positive outcomes for integrating curricula. Additionally, the study reveals complications teachers face when implementing an integrated curriculum, which could be alleviated with proper pre-service integration training.

Hovland et al. (2013) examined the Food, Math, and Science Teaching Enhancement Resource known as FoodMASTER. FoodMASTER encompasses a compilation of projects that use food as a tool to integrate science and mathematics. The first implementation of FoodMASTER was piloted in Ohio in 2007 with third-grade students and has since been revised yet again. Previous studies conducted on these implementations show that students were interested in the subject matter and motivated to

learn, and their scientific skills were developed as well. The more current, 2009-2010 study incorporated FoodMASTER into 18 intervention and 16 comparison grade 4 classrooms. Teachers were given 24 45-minute-long lessons that they were required to implement at any time during the school year. The lessons were centered on topics that integrate science and mathematics such as "Food Safety or Meal Management" (Hovland et al., 2013, p. 82). A total of 641 students completed a research developed science knowledge exam at the beginning and end of the program. The results conclude that integrating disciplines around food-based topics is an effective teaching tool to help teachers cover all curriculum expectations.

Halverson et al. (2014) designed an experiment that aimed to decrease the achievement gap between students of high and low-SES school districts using curriculum integration. The study began by assessing student achievement of two high-SES school districts to establish a target level for the low-SES students. Then, two project-based unit plans were created, each lesson lasting about 45 minutes, grounded in project-based pedagogy characteristics. One unit targeted curriculum expectations in economics and literacy and the other unit targeted civics and literacy. Six teachers from Michigan were involved, two from high-SES districts and four from very low. In addition, 10 to 12 second-grade students in each class were randomly selected and assessed which totaled 43 in low and 20 in high. Assessments were completed before and after the projects using individually administered interviews by a trained researcher and whole-class administered assessments.

The results determined that the students from the low-SES schools attained statistically equal levels of achievement as the high-SES students in social studies and reading. Students also were more likely to make connections between the lessons,

disciplines, and life outside of school. Thus, the authors conclude that it is possible to narrow the achievement gap between low and high-SES students using an integrated social studies and content literacy approach grounded in project-based learning. Hence, this study suggests that curriculum integration has the potential to bridge the high and low SES achievement gap which in turn justifies its' use and the importance of teacher integration training.

Judson and Sawada (2000) contemplate whether implementing an integrated curriculum for eighth graders will increase student achievement or have no effect on it. At Avalon Junior High, the science and mathematics teachers decided to coordinate their lessons so their students simultaneously learned comparable concepts. The study consisted of 26 control students and 27 who participated in the 3-week project. Results are dependent upon letter grades assigned for a statistics test. These results suggest that student academics in mathematics are improved when mathematical concepts are integrated into scientific activities. That is, the students who participated in the integrated project scored higher than those who did not. However, teachers faced multiple barriers to integration such as lack of training and inadequate equipment and resources. Teachers also created their own barriers as they showed an unwillingness to alter their pedagogy and a sense of being stuck in their own beliefs. The authors conclude by suggesting that curriculum integration is impossible without a teacher who is enthusiastic and willing to progress their practice. The study also reveals the importance of teacher integration training when implementing such a curriculum.

Brough (2012) addresses a project in which three teachers from diverse schools in New Zealand implement a student-centered integrated curriculum. The purpose of the study sought to determine the impact this curriculum approach had on both teachers and

students. The three teachers who participated in the study were trained in curriculum integration and taught grades 1, 4, and 6. The study lasted 9 months and mapped out variations of three phases that slowly progress toward more and more integration. The study utilized semi-structured interviews, recordings of focus group meetings, informal discussions, naturalistic observations, photographs, and samples to gather the data. The findings illustrate that democratic learning environments are possible and that curriculum can be efficiently shaped between teachers and students.

These teachers made a shift from talking about democracy to actually thinking and acting this way. The study also revealed that the most effective way to ask students questions is asking freely without a particular academic reason, just to genuinely listen to their thoughts and opinions. Also, when teachers acted on their suggestions the students showed much more motivation and ambition to learn. Students also showed improved abilities in applying learning to new contexts, making informed decisions, and problem solving. Furthermore, the teachers found that by slowly increasing integration, they gained confidence and competence in their practice. The authors state that the teachers believed their group meetings were an integral part to the success of the project. They got to share practices, discuss changes, seek and provide support, challenge their own thinking, and plan for the future. Finally, Brough (2012) notes that the professional development that the teachers had prior to this project was central to the success of the study. Hence, the importance of teacher curriculum integration training is highlighted in this study.

Trent and Riley (2009) illustrate a collaborative research project that aimed to integrate art into the elementary curriculum through targeted planning, application, and assessment. The participants of this study were a class of fourth graders from Park Hill

Elementary, located in Denver, Colorado. These students participated in an integrated unit that is theoretically grounded in constructivism, co-equal integration, multimodality, and democracy. The unit was thematically constructed around the "Foundations of Democracy" and had the students engage in a variety of readings, discussions, and research (Trent & Riley, 2009, p.16). The lessons integrated the arts with a variety of supplementary discipline areas such as social studies and language. The lessons were student-centered, interactive, and thought provoking in order to support the various styles of learning. Student learning was measured using pre- and post-assessments, anecdotal notes, focus group interview questions designed to assess student learning, and formal rubric assessments of student work and relationships with peers.

The results of this study were highly in favour of art curriculum integration. Trent and Riley (2009) found that these lessons supported student learning across all the targeted discipline areas and standards and that many of these students even exceeded curriculum standards in art, social studies, and writing. Students also enjoyed the incorporation of art; they demonstrated improved engagement and a strong sense of efficiency. Students also developed a heightened ability to relate new concepts from the unit to their own lives and made personal changes as a result. Furthermore, the study found that having easily accessible resources and materials, collaboration between faculty, and administrative support is imperative for successful implementation. Thus, Trent and Riley (2009) believe that these findings show the undeniable value in art curriculum integration yet warn that teachers need professional development options dedicated to this curriculum integration.

The Need for Guidance and Teacher Development Programs

Zhou and Kim (2010) discuss a study that aimed to better prepare pre-service

teachers to adapt an integrated curriculum approach at the elementary level. A public university in the city of New York, offered pre-service teachers registered in the teacher education program a methods course that covered multiple discipline areas; math, science, and music. Forty-seven participants registered for this program, which included course work and field experiences. The fieldwork allowed them to put their new knowledge into practice. The teachers were required to share their observations and thoughts using a reflective journal to see how this course influenced their perspectives on curriculum integration.

The findings demonstrate that prior to the course, teachers either had no knowledge of curriculum integration or did not understand how to design and implement one. Nevertheless, 88% of these participants still held a positive attitude towards the approach. After the course was completed, all participants claimed to have a better understanding and enthusiasm for curriculum integration. Moreover, these teachers agree that curriculum integration appears more motivating, engaging, relevant, interesting, and meaningful for students. The teachers also reported that the curriculum is better matched to real-life experiences. Thus, by the end of the course all participants had a strong, positive attitude toward curriculum integration and appreciated the emphasis placed on integration in their course. Zhou and Kim (2010) conclude by stating that this study demonstrates that teacher education programs with both course and fieldwork can greatly improve pre-service teachers' understandings and implementations of curriculum integration.

Vitulli et al. (2013) investigate the professional development grant program known as Arts in Education (AiE). Faculty and teachers from elementary, secondary, and higher education institutions in Mobile, Alabama, are in their ninth year of a

collaborative examination of AiE. They are essentially concerned with the goal of AiE, which is to train teachers how to successfully integrate the arts into supplementary disciplines such as literature, mathematics, science, and social studies. In AiE, teachers are taught how to incorporate artistic activities such as dance, music, theatre, and visual arts into other subjects to enrich student learning. Teachers undergo extensive and thorough professional development through mentoring classrooms where they are given the opportunity to collaborate with their peers. Teachers are provided with integration training, materials, teacher-generated lesson plans, mentoring, and even an optional graduate-level course. Vitulli et al. (2013) estimate that approximately 500 hundred teachers have taken part in this program and the impact has been consistently positive.

Through external reviews from the professionals who were part of the program, Vitulli et al. (2013) conclude that this program had inspired these teachers to incorporate active, student-centered learning in their pedagogies. These teachers wrote that the program was educational, fun, and fast paced. They found great value in the lessons and materials provided to them and were excited to put them to use. Thus, Vitulli et al. conclude that AiE is a beneficial collaborative process that should be used as a blueprint to maximize teacher integration knowledge, resources, partnerships, and student success.

The next study by Phillips et al. (2009) was concerned with professional development that shows teachers how to integrate mathematics and literacy to enhance student learning. Niagara University teamed up with a high-needs urban school district for this joint project. In the first phase of the project, middle school teachers were encouraged to have a group discussion about the learning needs of their students and the goals they would be striving toward. The second and final phase provided these teachers

with guidance, resources, and strategies to help improve their integrative practice. Teachers of both mathematics and science worked collaboratively to better understand each other's subjects. Data was collected informally through observation. The results of this project demonstrated that teachers had gained a better understanding of science and math content, knowledge, and skills. The teachers learned the importance of making connections between the disciplines in order for their students to better transfer these skills to other discipline areas and how to do so. Overall, teachers were more aware, confident, enthusiastic, collaborative, and knowledgeable. Thus, this study illustrates the importance of teacher integration preparation.

Park (2008) examined what Korean elementary school teachers experience when designing and implementing an integrated curriculum. The qualitative research interview method was utilized for this study in order to obtain a rich and detailed description of individual teacher experiences. Accordingly, three Korean elementary school teachers provided separate narratives on their experiences with integrating curricula. Upon analyzing the results, Park (2008) found that teachers were reluctant and even unsuccessful at times to integrate curricula because their understandings of the approach were significantly limited. Furthermore, they reported a lack of facilities, in-service training, and an excess of official duties that hindered their integration attempts. The traditional resources, assessment practices, school structure, timetabling based on discipline-based curricula, accountability pressure, and lack of collaboration were also common hindrances. The study also found that teachers were integrating disciplines without being aware of it at times. Consequently, Park (2008) discovered that these teachers utilized a mixed approach as they overlapped both the traditional discipline-

based and integrated approach. He suggests that teacher education programs and in-service programs are created to educate teachers and principals on successful design and implementation of the integrative approach.

De Araujo et al. (2013) were interested in teachers' perceptions of the integrated curriculum approach. Accordingly, their study observed teachers as they implemented an integrated state-mandated high school mathematics curriculum. In 2008, the Georgia Department of Education adopted the Georgia Performance Standards (GPS), which required teachers to adapt an integrated mathematics curriculum. The developers of this curriculum revealed that a particular goal of this document was to link mathematical concepts to ideas in other disciplines. For the purpose of this study, data was collected by means of focus groups and individual interviews. Six focus groups were conducted for a total of 27 participants from 16 schools in northeastern Georgia.

Results indicated that teacher understandings of integrated curricula in terms of mathematics were diverse. From the results, De Araujo et al. (2013) came up with a "Conceptions of Integrated Mathematics Curricula Framework" describing the varied perceptions held by the teachers: interdisciplinary integration, integration by strands, integration by topics, and contextual integration (p. 291). Thus, the results revealed that even if teachers were to use the same integrated mathematics curriculum, they would still have diverse perceptions of which concepts they are to connect and how to do so. These inconsistent perceptions could possibly result in students experiencing the same adopted curriculum in different ways. The authors conclude by stating that curriculum developers and teachers alike need to be aware of the diverse perceptions of curriculum integration and how they lead to dissimilar connections when attempting to enhance student learning.

Harrell (2010) discussed a study that was concerned with factors that relate to "teacher quality inputs" such as grade point average, coursework, and teacher test scores (p. 146). Thus, this study examined teachers in Texas who taught eighth grade science classes using an interdisciplinary curriculum. Various areas of science such as biology, chemistry, physics, and Earth science were incorporated in the studied curriculum. Teacher transcripts were collected from all the relevant discipline areas and surveys were distributed. There was a total of 93 eighth-grade teachers who participated in this study. The results of the study suggest that although over 90% of teachers who were surveyed supported an integrated curriculum; they believed that the workload was heavy and they needed more training for successful implementation. After analyzing their transcripts, Harrell proposed that these teachers may not have had the appropriate understandings of each discipline to teach them in an integrated manner. Thus, the author concludes by stating that teachers require more broad knowledge bases and curriculum integration guidelines or training for successful implementation.

Finally, Crisan (2014) aimed to analyze teacher opinions on curriculum integration—the eTwinning projects in particular. The eTwinning program is a component of the European Commission's eLearning program. It encourages curriculum integration and provides teachers with an online "portal" where they can go for resources, support, guidance, lesson plans, et cetera (Crisan, 2014, p. 31). One hundred and eight teachers who have 1 to 5 years of experience in the eTwinning community completed an online questionnaire. After analyzing their answers, Crisan (2014) reveals that high school teachers were more interested than elementary school teachers in utilizing the eTwinning projects. The data found that 82% of the teachers considered integrating

curricula to be essential and very important for their teaching success (Crisan, 2014, p. 35). Crisan concludes by declaring that heightened interest and research on the subject of integrated curricula is critical in finding the balance between both a disciplinary and integrated approach.

Teacher curriculum integration training strategies are not a new endeavour yet they are being discussed and developed in recent studies. For instance, Vitulli et al. (2013) examine a professional development program called Arts in Education which trains teachers how to successfully integrate the arts into other various disciplines. This program requires teachers to "undergo extensive and thorough professional development through experiencing mentoring classrooms where they are given the opportunity to collaborate with their peers" (p. 47). Moreover, these teachers are provided with integration materials, lesson plans, mentoring, and even an optional graduate-level course. The authors have concluded that this approach to teacher education is both effective and enjoyable for the teachers. Thus, they suggest the Arts in Education program is used as a blueprint for future integration training.

Similarly, Phillips et al. (2009) conducted a project to investigate the effect that their professional development program had on a group of teachers. This program trained teachers in integrating mathematics with literacy in order to improve student learning. The teachers were provided with resources, guidance, and teaching strategies to assist them with curriculum integration. They also were encouraged to collaborate with one another throughout the entire experience. Phillips et al. (2009) found their training program to be effective as teachers were reported to be more confident, aware, enthusiastic, knowledgeable about integration, and collaborative as a result. Comparably,

Crisan (2014) conducted a study where he provided teachers with a "portal" where they could find support, resources, integrated lesson plans, and guidance online when training teachers to integrate curricula. He also found that teachers were much more confident and comfortable integrating curricula upon completing the study.

Scholars such as George and Jinyoung (2010), Akerson and Flanigan (2000), and Chiatula (2015) have developed methods courses for pre-service teachers dedicated to curriculum integration training. George and Jinyoung suggest that pre-service teachers need to be provided with hands-on experience in the classroom in order to practice and improve curriculum integration skills, and also report that this also allows teachers to see the benefits of curriculum integration first-hand. Similarly, Akerson and Flanigan provide a list of essential components to their integration training course. Their pre-service course provides students with a comfortable risk free environment to share ideas and class projects-such as creating integrated units for practice. Akerson and Flanigan's program also encourages reflection, and the instructors model how to teach these integrated units. Finally, George and Jinyoung require students to watch tapes of curriculum integration taking place in classrooms because they believe seeing integration first-hand is the most effective teaching strategy. Comparably, Chiatula reports on a methods course where the use of field experience is emphasized in order for teachers to learn how to integrate. He also suggests that pre-service teachers need to be given the opportunity to examine the curriculum in order for them to develop their ideas across various disciplines.

Chapter Summary

This chapter established this study within the main theoretical framework of John Dewey's Progressive Education movement, which outlined the primary research

questions and narrowed the parameters of the study. The historical theoretical origins of curriculum integration were then investigated when addressing the core curriculum as well as project-based, thematic, and inquiry based learning. These educational philosophies are investigated from their historical roots to their contributions in the classroom setting. Finally, the chapter fast-forwards to curriculum integration in the 21st century. Neurological discussions as well as the countless modes of integration are discussed. Then, the numerous claims of both supporters and critics of curriculum integration are presented as well as their suggestions for implementation.

The final section of Chapter 2 presented the empirical intervention studies regarding curriculum integration. It begins by discussing one of the most well-known, highly acclaimed curriculum integration studies to date known as the Eight-Year Study. Then, the subsequent studies examined are organized under two headings: Impact of Integration and The Need for Guidance and Teacher Development Programs. The studies that emphasize the need for teacher development programs and guidance comprise the final section in an attempt to stress the importance of their growth.

CHAPTER THREE: METHODOLOGY AND RESEARCH DESIGN

This chapter provides a detailed description of the qualitative methods used to examine the curriculum integration experiences of pre-service teachers. I begin by affirming the purpose of the research, outlining my primary and secondary research questions, and then establish my qualitative research approach. Chapter 3 then elaborates on the research methodology, the research design, the participants, and ethical considerations. Next, this chapter discusses the potential research bias and limitations of the study at hand. Finally, the concluding two sections reassert the area of study and summarize the chapter.

Purpose of the Study

The purpose of this qualitative study was to determine the degree of curriculum integration training received by teacher candidates.

Research Questions

The present qualitative study examined three primary research questions:

1. Do teacher candidates have a base knowledge of curriculum integration?
2. Do teacher candidates feel comfortable to integrate curricula after completing their teacher certification year?
3. How much training have teacher candidates received in curriculum integration during their university career?

Research Methodology

A qualitative approach was used to examine the degree of curriculum integration training received by teacher candidates as well as their knowledge base and comfort levels with the subject. Qualitative research relies on the perspective of participants in the

study (Smith, 2015)**.** Thus, the participants of this study were asked a total of five open-ended questions in one-on-one non-structured interviews. They were given as much or as little time as needed to answer these questions. Their answers comprise the only data analyzed and compared for the purpose of this study.

Justification of Research Methods Implemented

The research methods implemented for the present study are indicative of its purpose. First and foremost, the objective of the study is to gain insight into teacher candidate experiences with curriculum integration and training. As discussed above, qualitative research examines the experiences of the participants involved (Smith, 2015). Thus, the data or teacher interview transcripts were analyzed using general thematic analysis to find commonalities among answers. Once the study was completed, student information was securely deleted and the participant answers remained anonymous. Thus, the methods used were naturally consistent with the aim of the study. Confidentiality and asking open-ended questions allowed the participants to have freedom when answering their interview questions. Moreover, it allowed the researcher (myself) a genuine account of their experiences with this pedagogy, which lends to the credibility of my study.

Research Design

The research design encompasses the entire process of the research study from generating research problems, to deciphering the methods of collecting data, to analysis, to actually writing up the report. Creswell (2003) suggests that outlining a general framework for all research in order to guide inquiry and better inform researchers is essential. Qualitative research relies on the perspective of the participants in the study, which can bring into question the validity of the research (Smith, 2015). Thus, there are

challenges to this approach that must be disclosed. Any good researcher knows that all aspects of the research process (e.g., validity judgments, limitations, etc.) need to be recognized and revealed in light of the results adhered, thus allowing the reader to determine the rigor of the results for his or herself.

Procedure. The participants for the study were recruited through the teacher education student email list. These teacher candidates were sent a letter of invitation via email where they were informed of the study's purpose and asked to provide informed consent. The professors of the teacher candidates were sent a similar email to ask permission for the primary student researcher to come into their classroom at a point that was convenient to them, to briefly (approximately 10 minutes) discuss the study and hand out more letters of invitation/informed consent. The students were informed that it was their decision to participate or not, and that it would not affect them in any way if they chose not to- even if they agreed to participate and changed their mind last minute.

Students were then emailed a copy of the interview prompts approximately one week before the interview for advanced consideration. The semi-structured interviews were audio recorded for subsequent analysis and scheduled at a time and place (i.e., quiet location on campus such as a faculty office or library study room) of participants' convenience. The interview process took approximately 20-30 minutes for each teacher candidate and was audio recorded on the primary researcher's cell phone. Once the interviews were completed, the interview transcriptions were completed by a professional transcriber who had signed a third-party confidentiality form. The students who completed these interviews were assigned a pseudonym or participant code to ensure confidentiality. The participants were also provided with a transcript of their interview(s)

as well as a synopsis of related themes for their review, with the opportunity to provide clarifications/edits or deletions.

Once the data or interviews were collected, the general thematic analysis method was used to identify patterns within the data. Essentially, all the data collected was thoroughly examined for reoccurring themes in participant answers. A theme is a meaningful and coherent pattern in the data that holds significance to the research questions (Clarke & Braun, 2013). The themes were collectively reviewed for coherence and reflected upon by the researcher. Then, the researcher defined and labeled these themes by writing up a summary and analysis of each. These summaries lend to answering the research questions in place.

Participants. The participants and data sources for this study were one in the same. They consisted of teacher candidates finishing their teacher certification year at a mid-sized university in Southern Ontario. Some of these students were in the concurrent program and the remainder were consecutive (see chart on pg. 20). There were 25 participants in total, twenty were female and five were male. All of the participants had taken a variety of subjects in their undergraduate programs as their minors/teachable subjects were dissimilar. The data collected from the study were solely teacher candidate answers to interview questions asked by the researcher. These responses were later grouped under themes that emerged from the participants' answers.

Convenience sampling was the form of sampling used in this study. Convenience sampling simply comprises participants who are willing to partake and fit a certain criteria for the study (Emerson, 2015). Thus, the researcher (myself) briefly introduced the study to the teacher candidates of the university and relied on their inclination to

consent. This study also developed a snowball sampling method in which more participants were recruited due to the participants telling their fellow classmates about the study (Emerson, 2015).

Convenience sampling strategy. Qualitative research analyzes the experiences of the participants involved and phenomenological studies refer to when a researcher investigates a human experience through their descriptions (Smith, 2015). Moreover, it is common for a qualitative study to examine the lived experiences of humans who fit a certain criteria (Smith, 2015). Consequently, this generic qualitative study has employed a convenience sampling strategy to select teacher candidates in their final year of university. This study also developed a snowball sampling method in which more participants were recruited due to the participants telling their fellow classmates about the study (Emerson, 2015).

Data collection/ data sources. For the purposes of this study, the teacher candidate interviews were the sole sources of data. The data was collected using one-on-one interviews, which were recorded on an audio device and then later transcribed into text.

Role of the researcher. The methodology of this study was guided by general thematic analysis, which looks for themes across participant explanations in order to make reports about the experience under investigation. Thus, I, the researcher, was a key instrument in the analysis and description of the teacher candidates' experiences described to me. I was responsible for recruiting the teacher candidates, conducting the interviews, and then transcribing the responses given.

Establishing contact. To begin with, ethics approval was received from the

Research Ethics Board- File #15-244 (Appendix F). Then I, the researcher, emailed the professors of the university who taught teachers college courses to ask for permission to come into their classrooms and introduce myself and my study. Once permission was granted, I was told by these professors when and where their classes took place and was given a time to come and talk to the students. For a few weeks, I went to teachers' college classes and introduced my study while handing out my contact information. Students contacted me via email and text to set up interview times and locations. These participants were met at two campuses for the same university during interviews where consent forms were signed before the interviews began. The letters of invitation and informed consent forms are available in Appendix A.

Interview procedure. Creswell (2005) advises that researchers follow a protocol when conducting interviews during a qualitative study. He states that a typical interview protocol includes four to five scripted questions that pertain to the established research questions. Creswell (2005) also advises that researchers keep their options to themselves when participants are answering these interview questions. Thus, this interview protocol method structured my interviews with scripted questions designed to produce open-ended answers where the participants did not feel as though I was passing judgment on their responses.

The private interviews took place in the months of December 2016 and January 2017 with the participants choosing where they would like to meet the researcher. All but one interview took place on the school campuses. I first went to classes to provide my information to anyone who was interested in participating. From there, the students emailed and texted me to set up interview times and places. Upon meeting these students,

I had them sign the consent forms and the interview process began from there. All participants were asked the same five questions which inquired about their knowledge base of curriculum integration along with their experiences and comfort levels with the topic. The interview questions are as follows:

1. What does the term integrated curriculum mean to you?
2. Can you give me an example of a time where you saw it being used?
3. Through your course work, how much have you talked about integrated curriculums? Can you give me an example?
4. Could you tell me about a time where you spoke about integrated curriculum?
5. Would you feel comfortable to integrate curricula on your own in a classroom setting? If yes, what led to this confidence? If no, why wouldn't you feel comfortable?

Furthermore, Turner (2010) recommends that the researcher does not rely on memory to recall participant answers. Thus, I recorded the participant's verbal responses using an app on my iPhone 6 app called Voice Memos. Turner (2010) also suggests that during the interview I occasionally verify that the audio recorder is working to prevent the participants from having to repeat their answers. Once the interviews were recorded, I uploaded these audio files to my password protected computer under numbers from 1-25 in order to secure the files and the privacy of the participants.

Data Analysis and Theme Development

Transcription. A professional transcriber who signed a third-party confidentiality form was hired to transcribe the audio interview recordings. Participants' identities were protected under their assigned numbers when the files were sent to this transcriber via

secure file sharing. Once the transcriptions were complete, the files were sent back to the researchers via secure file sharing as well.

Themes. Once the participant responses to the interview questions were transcribed, the researcher read them twice over, noting the common themes in responses. Then, on the third time reading the teacher candidate responses, the researcher grouped the answers into the emerging themes. This was done on the computer in a Word document, using the copy and paste feature to create the groupings. Next, the researcher carefully read over the responses in each grouping and came up with a heading or theme to reflect the answers in that section. Thus, these themes emerged as: definitions, buy-in, experiences, and preparedness which can be found in the results section of Chapter 4. Finally, the responses in each group were further filtered in order to easily discuss the commonalities within each theme.

General thematic analysis is a method used to analyze and identify patterns within qualitative data (Clarke & Braun, 2013). Clarke and Braun (2013) identify six main phases of a thematic analysis that were adapted for the purpose of this study. The first phase requires the researcher (myself) to become familiar with data—listening to the recorded interviews and reading the written transcripts multiple times while noting any initial observations. Then, the coding process is completed for the data collected. This requires the researcher to create labels for any important features of the data that is relevant to the broad research questions. Coding is "not simply a method of data reduction, it is also an analytic process, so codes capture both a semantic and conceptual reading of the data" (Clarke & Braun, 2013, p.121. Thus, the researcher (myself) assigns a code to every data item and completes this phase by organizing all the codes and relevant data excerpts. Then, themes

are searched for throughout the data collected. A theme is a meaningful and coherent pattern in the data that holds relevance to the research questions (Clarke & Braun, 2013). Essentially, the researcher is looking for similarities within the data. This "'searching' is an active process; themes are not hidden in the data waiting to be discovered by the researcher, rather the researcher constructs themes" (Clarke & Braun, 2013, p.121. After all the coded data is collated to each theme, all of the themes are reviewed. This requires the researcher to check that all the themes are coherent in relation to the coded extracts as well as the full data-set. The researcher reflects on the themes and whether they reveal anything convincing or compelling about the study at hand while attempting to define the nature of each individual theme and their shared relationships. Next, the researcher defines and names the themes by writing a detailed analysis of each theme and sharing the "essence" of each. Finally, the researcher completes a write up of the analysis, which is an integral part of most research. The researcher summarizes the analytic narrative and data extracts in order to tell the reader a coherent and persuasive story about the data while contextualizing it in relation to the existing literature.

Ethical considerations. It is pivotal that researchers recognize that they have a responsibility to conduct their research in an ethical manner. They must "ensure that the autonomy and wellbeing of research participants is respected at every stage of the research process" (Stockley & Balkwill, 2013, p. 2). Thus, researchers need to be aware of protecting the privacy and confidentiality of their participants as well as acting in a fair, equitable fashion during the research.

Privacy/confidentiality. The identity of the participants who took part in this study were fully protected. Personal identifiers such as name, home address (if provided),

student email, alternative email (if provided), and contact number (if provided) were kept on a password-protected computer that was located in a locked office of the primary student researcher. Each participant was assigned a pseudonym, with all data related to this individual filed accordingly. Consent forms were separated from interview transcripts and kept in a secured cabinet. Audio recordings and transcriptions of interviews were also stored in this secured area. Only the researchers had access to all data, with the transcriber (if used) having access to the interview audio files (stripped of identifier) only. No personal identifiers were retained after the project was complete.

Consent to participate. All participants were informed of the research study and purpose before, during, and even after participation. The teacher candidates were required to sign a consent form confirming their participation in the study. The option to participate in these semi-structured interviews was emphasized to teacher candidates throughout the research study presentation, with the purpose of the study clearly indicated in the invitation letter. It was also emphasized that students may elect to withdraw their participation in the study, or refrain from any specific component or question within it, at any time and without any consequence including academic penalty. Furthermore, I had received first ethics board then teacher candidate approvals before any research commenced.

Document security. All documents related to this study were stored on a MacBook that is password protected at the researcher's home. All documentation gathered in respect to this study was securely deleted at the researcher's home. Consent forms were separated from interview transcripts and kept in a secured cabinet. Audio recordings and transcriptions of interviews were also stored in this secured area. Only the

researchers had access to all data, with the transcriber (if used) having access to the interview audio files (stripped of identifier) only. No personal identifiers were retained after the project was complete.

Potential research bias. As mentioned in a previous section, I personally view curriculum integration as an effective, refreshing, natural learning process. That is, I tend to side with the supporters of curriculum integration. Consequently, although my objective is to remain neutral and have the results of the study speak for themselves, there is always the possibility that my literature review, research, presentation of data, and discussion on the topic holds bias. This is important to consider when determining the accuracy and validity of my research and results.

Study Limitations

In this chapter I have discussed the qualitative design of this study along with the benefits of such an approach. However, as with all research, there are limitations to this research approach. I would argue the main limitation to my study is the very characteristic of qualitative studies designed to examine the lived experiences of humans who have an experience in common (Smith, 2015). In this study, convenience sampling was used in order to find students who were teacher candidates in their final year of schooling who were willing to participate. However, convenience sampling sometimes results in participants who are from the same geographical area (Emerson, 2015). Hence, these participants may have similar socioeconomic statuses or ethnic backgrounds as a result (Emerson, 2015). Moreover, my study consisted of 25 teacher candidates all attending the same university. Thus, more research must take place in order to examine the curriculum integration training of *all* teacher candidates and to attempt to verify the

generalizability of the results.

Restatement of the Area of Study

The current qualitative study examined the integrated curriculum approach to teaching and learning. More specifically, the study reviewed the amount of curriculum integration training received by teacher candidates of a medium sized university in Southern Ontario in completing their final year of schooling. The primary purpose of this study was to determine the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. The study also revealed the knowledge base of curriculum integration that these teachers had acquired during their university career.

Chapter Summary

This chapter outlined the methods used in this qualitative study where the knowledge base of curriculum integration and training received by teacher candidates are examined. The chapter began by identifying the study's purpose and research questions. Next, I described why this study is undeniably qualitative in its intentions, seeing as it relies on the lived experiences of the teacher candidates in training. Furthermore, Chapter 3 presented a rationale for using the phenomenological research method which refers to the examination of common meanings or lived experiences of several individuals in regards to a concept or phenomenon (Creswell, 2005). General thematic analysis was then chosen as the research methodology, which looks for themes across participants. These themes or patterns will be used to make reports about the experience under investigation.

The chapter then described the research design in relation to the qualitative

approach being utilized. It then outlined the procedure, discussed the participants/data sources, and identified interviews and later transcripts as the modes being used. As mentioned in this chapter, this data was analyzed using general thematic analysis to compare and contrast the answers of the teacher candidates and find common themes. This chapter also discussed the ethical considerations of the study such as privacy/ confidentiality, consent to participate, and document security. Additionally, Chapter 3 discussed the study's potential research bias and limitations. Finally, the last two sections restated the area of study and summarized the entire chapter.

CHAPTER FOUR: RESULTS

The purpose of this study was to determine the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. It also assessed whether teacher candidates have a base knowledge of curriculum integration. Each participant answered all five of the research questions asked by the primary investigator. This chapter presents the analyses of their interview responses. In accordance with the general thematic analysis approach, the participant responses were examined for re-occurring themes. These themes or patterns were then used to make reports about the experience under investigation. The themes produced from the interview responses were as follows: definition of curriculum integration; curriculum integration buy-in; experiences with curriculum integration; and preparedness to integrate curricula. These results are discussed in accordance to each theme they contributed to which could then be distilled further into subtopics. The subtopics are discussed in relation to each theme they fell under. This chapter concludes with a summary of the research findings.

Theme 1: Definition of Curriculum Integration

Combining Subjects, Topics, and/or Strands. One of the five research questions asked students to define curriculum integration in their own terms. Fourteen of the 25 participants referred to the combining of subjects, topics, and/or strands into lessons and/or units to define the term. For example, one participant stated, that curriculum integration was the act of "taking different pieces of the curriculum, ah different streams, different topics and putting them together" (Participant 1). Another teacher candidate suggested it was "knowing how to take different aspects of different

strands and different subjects and kind of merging them to create this bigger piece" (Participant 7). Eight of the 14 students referred to the curriculum in their answers; for example, "blending two or more subjects into one lesson or unit or something so students are working on multiple expectations from different subjects at the same time" (Participant 9). Furthermore, one participant suggested that curriculum integration units end with a final project: "taking subjects with similar topics and merging them together… doing like a huge unit plan or project" (Participant 11).

Uncertain Definitions. Five of the 25 participants mentioned the combining of subjects and topics but expressed some uncertainty in their definition. For instance, one student stated, "I don't know if that's the goal of integrated curriculum, is to integrate everything or integrate certain topics" (Participant 1). Another participant asked the interviewer for assistance when defining the term: "in most cases my understanding usually there's one main subject right?" (Participant 19). One student pointed out the differences in understandings, suggesting that "I think we all kind of have our own interpretation of kind of, what it means" (Participant 16).

Referencing "Cross- Curricular." Another commonality found when defining integrated curriculum was teacher candidates referencing the term "cross-curricular" integration. Eleven of the 25 participants described curriculum integration using the term "cross-curricular." One participant highlighted this familiarity by stating, "I put integrated curriculum and cross-curricular; I think they're synonymous I think ... they really mean the same thing" (Participant 5). Another student states, "I don't think I've ever heard it being used as integrated curriculum more as just cross-curricular" (Participant 12). Similarly, one student explained "a pseudonym that immediately comes

to my mind is cross-curricular umm, so crossing different, umm, sets of curriculum together to kind of mold into different kind of curriculum" (Participant 21). Thus, these participants used the term cross-curriculum interchangeably with curriculum integration: "I think maybe twice we've done cross- or integrated curriculum" (Participant 4).

However, seven of the 25 students were so familiar with the term "cross-curricular" that they were unclear of its' relation to the term "curriculum integration." One participant points this out: "to me integrated curriculum means cross-curriculum so I feel the same way about those two—I don't know if they're different—I think they're the same" (Participant 4). Another example would be a teacher candidate claiming to not know what curriculum integration is: "I didn't really know about it anyways so I just knew about cross-curricular" (Participant 8). Similarly, one student admitted to doing some research online in an attempt to prepare for the interview stating she did not know what curriculum integration was: "and then when we looked up online and it was cross-curricular so doing science and language together" (Participant 12). Moreover, some students viewed the two terms as unrelated: "in my grade 1-2 class I already had to, well not integrate, I had to, I don't know what the word would be, I had to um, cross- not cross-curricular; combine, look at the two grade strands and then combine. I don't know what that is" (Participant 18). Another student states that she would integrate curriculum in her teaching but expresses concern around "cross-curricular"; she states: "I would say I feel comfortable to integrate the curriculum in my teaching; I don't know about cross-curricular though" (Participant 6).

Combining two Subjects Total. One of the most prominent themes throughout the participant answers was defining curriculum integration by referencing two subjects

total. Nine of the 25 participants used solely two subjects in their formal definition: "integrated curriculum would be merging, um, merging two curriculum bases together whether it be science and math or music and French, um, just integrating them and using, teaching two curriculums in one lesson" (Participant 6). Similarly, 23 of the 25 participants defined the term by simply discussing two subjects being integrated as examples. For instance, "science and language together- to me, is what that means just putting two subjects together" (Participant 12) or "geography and literacy, so kinda just merging them together" (Participant 10). Interestingly, one student pointed out his preference in integrating one subject over multiple: "I think it's a lot better if you can fit them in where you can, and if its only one because when we had to fit three additional areas of the curriculum into one science lesson it became, the lesson became very unclear… I don't think you would ever try and fit four subjects into one it just doesn't make any sense; it's just not necessary" (Participant 15).

Using one Subject to Teacher Another. Additionally, 21 of the 25 teacher candidates discussed curriculum integration as utilizing one subject as a means to teach a concept in another. That is, they referred to curriculum integration as a pedagogical approach to develop student learning in another subject. For example, one student states, "social studies is a big thing that once you anchor like social studies, the big ideas and then everything else is anchored under that but you're still teaching towards the big overall—social studies" (Participant 8). Another participant explains how science lessons can be used in an integrated curriculum to work through language conventions: "in science if you do an experiment, and then you have to write a report, there's automatically even if you're not doing language conventions... you're being asked to do

proper sentence structure, proper everything" (Participant 12). Finally, another student discusses how using art to teach science can heighten student interest: "my science unit I had them, they had to draw a planet, so, that way there are students who enjoy Art who are now interested in Science" (Participant 23).

Phys. Ed and the Arts and Humanities. Finally, when participants would discuss curriculum integration between two subjects, 21 of the 25 participants would include a subject from physical education or the arts and humanities. For instance, one student discusses how language arts can be connected to most subjects, "so making sure that it's not just language arts time it could be social studies and you could combine language arts or I think that's the one that you connect the most to—language arts" (Participant 18). Another student states that he will "always bring together math and art" in his teaching. One participant discusses a science class "where you'd have to go outside and do a scavenger hunt and label a bunch of trees, um, and landforms; this also connected to phys ed. and physical activity and outdoor education" (Participant 6).

Theme 2: Curriculum Integration Buy-In

Teacher Benefits. The interview results indicated that 19 of the 25 students believed curriculum integration to be a beneficial strategy to use in the classroom. Ten of the 25 participants addressed the benefits that teachers experience in integrating curricula. The participants suggested that teachers integrate curricula in order to "meet multiple expectations" (Participants 4 &15) "with the limited time you have as a teacher" (Participant 23). The participants also believed you "can cover more information that way and find more ways that you can connect with them" (Participant 10). One student stated that she felt teachers were "kind of limited to how the curriculum is structured with just subjects at a time when really everything is really interrelated" (Participant 11).

Student Benefits. Thirteen of the 25 teacher candidates also expressed their confidence in the positive outcomes of curriculum integration on student learning. One student suggested that curriculum integration would help students to "get more out of their education" (Participant 5). Other students suggested that curriculum integration helps teachers to "play on their interests, you play on what they know, of what they're curious about" (Participant 5) to make a more effective lesson and "get more kids engaged" (Participant 22). Curriculum integration also provides repetition for students so that they can see "that ... the same skills you learned in inferring in Language class can be used in inferring in Math class and in Science class and it was just a cycle … it just built that stronger knowledge of whatever the topic or subject material was" (Participant 21). Many students pointed to the notion that students are "able to access various sectors of the brain. You can look at the same problem in so many different ways and solve it in different ways" (Participant 5).

Seven of the 25 participants also felt that curriculum integration helps students better apply their learning to the real world. For example, they said it helps to give students "broader meaning and things that they can actually use" (Participant 7) and it is "not just Math, it is not just English, it's any subject at any time and will be valuable information to have outside of the school walls" (Participant 21). Thus, it shows students "how everything is interrelated because it is. In life, you don't go into a situation and be like so this is going to be the knowledge on Science. You just go into a situation and pulls from Science. It pulls from all these things. … So why are we setting up an education system that is so divided. When life isn't dividing" (Participant 22).

Eleven of the 25 teacher candidates also addressed the benefits of incorporating physical education and the arts and humanities when discussing two subject integration:

"if you're kind of an art minded student or something and you're doing math, seeing how you can take something that's within the art curriculum and be creative within doing a mathematical problem" (Participant 11). Similarly, another described a science unit he implemented where he "tried to get them outside and get them active in that fresh air, while learning to appreciate the earth" (Participant 20). However, some students would simply state the convenience of integrating these subjects as justification: "Visual Arts is obviously easy in friggin anything" (Participant 22). Another student likewise stated, "I think I feel like everyone their default is just oh just make it a skit, just make it drama right? Or oh have 'em read a book" (Participant 19). One student claimed that "literacy is the easiest, incorporating a story into a Social Studies lesson. …Especially in primary grades you can find storybooks for, no matter what you are teaching" (Participant 20)

Hindrances. Not only did participants highlight the benefits of curriculum integration, they also addressed the hindrances. To begin with, six of the 25 teacher candidates suggested that the process of integration is "difficult" (Participants 4, 19, & 23) or "much harder to plan" (Participant 4). The participants suggested that it is very time consuming and many teachers may find it "challenging to always incorporate it" (Participant 13). Thus, this student asks, as a teacher, "is that maybe realistic? I'm not too sure" (Participant 13). Furthermore, three participants pointed to their concern in not having enough knowledge/ training/experience in curriculum integration. They believed that "it is something that you have to be an experienced teacher to do. I don't think there's many teachers that could just start and come in and say, oh I have an integrated curriculum" (Participant 4). Thus, two participants mentioned the idea of curriculum integration only being possible in a collaborative environment. For example, one student said, "it's not something you can really do on your own so much" (Participant 8). The

other stated that “I really just want to see more and experience how other teachers have done it and are doing it and work with people who are sort of ahead of the times and know how to do this well and so I can just jump in” (Participant 9).

Structure of Education. Finally, some students address the structure of education in general as the reason why curriculum integration is difficult for them to grasp. For instance, one student proposes:

> I feel like there’s a disconnect between what we should be doing and what we’re told to be- do and how they actually practice it at school which I understand university is different but I think that also kind of creates a disconnect because we just learn one subject at a time. (Participant 10)

Another student claims: “I found that all of the courses that would address integrated curriculum are subject specific” (Participant 22). Finally, one student states:

> The thing is, teachers’ college is organized again so that you learn how to teach the subject, you learn how to teach this subject, you learn how to teach this one. And so well the idea of integrated curriculum is thrown around a lot and we do talk about it on and off, to actually fully do it is another thing and to fully know how to apply it and I know. (Participant 25)

Four of the 25 students suggested that curriculum integration is unmanageable after elementary school. One student stated, “once you get to high school it is very hard to do right because every subject is its own teacher” (Participant 25). Another student claimed that “maybe integrated curriculum is suited better for elementary than it is high school” (Participant 1) because their job titles are subject specific: “I don’t even know why a history teacher would bother working in anything else. Because they were hired to specifically teach history” (Participant 22). Some participants even suggested that this

integration will have negative implications on student achievement. Some worry that "you're connecting too many things and then you think to yourself like you're in a classroom I don't know, it might be too much. … I just have to watch myself, like how much I try to accomplish all at once" (Participant 24). Additionally, another student similarly brainstormed the likelihood of students wanting to participate in an integrated unit: "Are students going to want to do this unit? No. I can make it more interesting and appealing unit to a student if I had just done it um if it was just one curriculum or one subject, yea, one subject" (Participant 4).

Assessment. While teacher participants discussed both the benefits and hindrances of integration, eight of the 25 participants commented on the assessment aspect. Two stated that they feel uncomfortable with assessment and curriculum integration: "what I am uncomfortable with is the actual assessment piece of it… how do you assess two different curriculums at the same time" (Participant 20). Another student stated:

> I find the assessment part the most difficult so yes I could put social studies and language arts together but knowing kind of which expectations are really being assessed whether I can you know, kind of do both at the same time I think the assessment piece is where I would struggle the most. (Participant 16)

In addition, four of the 25 participants stated that they believe all the subjects and expectations that are included in the integration must be assessed. One student suggested, "if you're not assessing it, it's not necessary to add, so if you're adding the language component, the language component needs to be assessed, otherwise you can't really just put them together" (Participant 15). Similarly, another student states, "when you put the

expectations in that you also have to be assessing for every single one" (Participant 18).

In contrast, two of the 25 students felt very strongly about not assessing all of the subjects and expectations that are integrated. One student stated,

> like I said I don't think it is always fair when you are using language … specifically, for History … or Math in the communication. … That your mark, your History mark could, or Social Studies could be negatively affected by your lower Language Arts skills … because you would have to have two different rubrics, for two different things. (Participant 20)

Another student voiced similar concern:

> Not try to assess everything because one you won't be able to and then two that's not fair. To the kids who do struggle in certain areas. Then, all of a sudden, every single time you assess them they are always going to be struggling. (Participant 22).

Importance of Meaningful Connections. Another key focus of the interview data was the importance of teachers integrating with authentic or meaningful connections. Seven of the 25 students believed that having authentic/meaningful curriculum connections would determine the effectiveness of the lesson or unit. One student explains the importance of this idea, "it would have to be in the right context you can't- you can't make things fit that don't fit together- that's just, in my opinion a bad idea- it makes for learning that isn't as strong as it would be if you didn't do it" (Participant 4). Similarly, another student suggests that the unit or lesson must be meaningful to the students as well: "you have to think about the inquiry too, cuz you can't just be like okay here's our big idea and the kid is like that's not my idea, you know you have to talk to them about it

and really it should come from them … so on the spot you have to be like, okay ... how do you change everything to be what their inquiry is" (Participant 8). Thus, the participants believed that the integration should feel natural because "sometimes when it's forced … that's when it becomes less meaningful" (Participant 15).

Theme 3: Preparedness to Integrate Curricula

During the teacher candidate interviews, participants were asked if, upon graduation, they would be comfortable integrating curricula on their own in a classroom setting. Out of the 25 participants, eight answered that they would be comfortable, four said they would not be comfortable, and 13 gave a response that was somewhere in between the two choices.

Comfortable. For those who stated they would be comfortable integrating, they attributed this comfort to their experiences with integration whether they discussed their placements or simply just "after seeing it in action and seeing more examples of it being done. It seems a lot more feasible" (Participant 3).

Not Comfortable. There were four teacher candidates who reported to not at all be comfortable integrating curricula upon graduation. These students contributed their unpreparedness to both lack of teaching experience and lack of curriculum integration training. One student stated that he does not "have sufficient information to integrate it; however if I did additional research on my own and actually found different ways then I would be able to successfully do it but not with what has been taught" (Participant 14). Another suggests, "I don't think I'd be able to integrate a full curriculum into a, or two full curriculums into one. I don't have the confidence in doing it, partly because my training and partly because my lack of experience teaching" (Participant 1).

Undecided. Thirteen of the 25 teacher candidates could not decide if they were fully comfortable or not integrating curricula so their answers remained somewhere in the middle, such as "I don't know if I'd be 100% comfortable" (Participant 18) or "I am really sort of in the middle" (Participant 25). Almost all of the participants recognized this uncertainty stems from a lack of "teaching experience" (Participant 8). For instance, one student said that the concept of curriculum integration is "a little bit foreign because I haven't actually had practical experience doing it so I wouldn't feel comfortable in that sense. … I think you would have to start small, do little things and then you could lead to really big projects that have really cool endings. So yeah, I'm kind of both" (Participant 7). Moreover, almost all the participants suggest that "with more practice I will gain confidence" (Participant 15) and that, "all new teachers, they're nervous, they feel like they don't know what they're doing, or they're doing something wrong and then that confidence just kind of comes later on so I think the more practice that we have with it" (Participant 10). Thus, they acknowledge that they may have "a lot of the head knowledge sometimes but we don't have a lot of practice knowledge" (Participant 25).

Prepared due to Drama Program. Students who were in drama classes throughout their university career claimed that this degree in particular helped them feel comfortable integrating curriculum. For example, one student suggested her confidence is "completely because of my experience within drama. … I feel like I've had a lot of experience in which I can work off of and learn from" (Participant 11). Interestingly enough, one student even suggested that he would feel more uncomfortable if he was told he could not integrate curriculum: "I would feel more uncomfortable if I didn't, that, if I was gonna do a math or a unit of any kind that was just within that singular discipline, I

would feel uncomfortable. … Limited, and I would feel more discouraged and more kind of unpassionnate" (Participant 5).

Theme 4: Experiences With Curriculum Integration

No First-hand Experience. The teacher candidates were asked in the interviews about their experiences with curriculum integration. Seven of the 25 participants reported to have never observed curriculum integration first-hand in both their schooling and teaching experiences. One student stated, "I never really seen it first-hand though, it being used in the classroom" (Participant 4). Another student claimed, "I don't really remember a specific time where I saw it being used. … I've never really seen it, or if it was then it wasn't that explicit" (Participant 7). In addition, two of these students attributed this lack of curriculum integration to the structure of schooling in place: "I feel like that's a way the system is set up" (Participant 22).

First-Hand Experience. Thirteen of the 25 participants testified to having integrated curricula themselves for lessons and/or units in their placements. One student discussed a unit he created: "in my placement we would try to incorporate as many subject areas as possible so we did dioramas … they're creating different communities that was the social studies but they're using different materials and we're trying to emphasize using textures so that was the art, and then at the end they presented it in an oral presentation" (Participant 15). Another student discusses a lesson where she "got them to measure the area of a circle, um, by measuring Pokeballs" (Participant 5). One student worked with her mother who was also a teacher to develop an entire integrated unit:

> we developed a whole unit for her about how to do citizenship … so they went

> into a mall and interviewed stores about fair trade and worked in a coffee shop and talked about waste… like math, you know, what are the best deals when you're walking in a store and how do you find that. (Participant 11).

Witnessed Integration. A total of seven teacher candidates also reported to have witnessed integrated curriculum in their university placements. One student describes a high school teacher he observed in his fourth year: "the other class that I sat in on was a grade 11 college level English class and the teacher is a drama teacher at heart, trained in that, and she brought in a lot of dramatic elements into her class" (Participant 1). Another student described how his associate teacher in his placement "didn't teach language he just taught it through social studies" (Participant 12). Thus, these seven students explained essentially how they learned from "other experienced teachers that I've observed and seeing, how they do it and kind of how they plan out their entire year and how they're gonna almost pick and choose curriculum" (Participant 19).

Experience as a Student. Four out of 25 students discussed their experiences with integrated curriculum as a student in the education system. One student explained how the arts would be incorporated in order to learn about topics from other subjects: "when we had to create a little play or do a drama or something about the topic" (Participant 11). Another student highlighted the integration her teacher included in her History class: "she found a way to teach us Math when it was a History class which is something we never seen cross into the History class before" (Participant 21). One example of integration was very open-ended as the student reported: "basically it was you got to choose your topic for the year and you got to, umm, make your own curriculum for it" (Participant 25).

Perceived Lack of Training. Out of the 25 teacher candidates interviewed, 20 commented on a lack of curriculum integration training in university. For example, one student stated,

> the only class that talked about it was fourth year, and I'm supposed to know all this stuff. … I'm supposed to know how to analyze curriculum, how to take pieces out, but I unfortunately, I don't, and that's not me being stubborn about it, that's me not learning about it. (Participant 1)

Another student declared that curriculum integration is "not so much spoken about I don't think in our classes like in our lectures" (Participant 16). Some of the students suggested that it was addressed more so in the teacher certification year than in their undergraduate studies. For instance, "definitely in um one of my teachers' college classes we mentioned it but never did any work or assignments around it" (Participant 6). Yet, others pointed to their practicum placements for training experience: "if there was no practicum, definitely not, would have no idea" (Participant 17). Another student similarly stated she would integrate curricula, however, "I wouldn't say because of the courses I've had in teachers' college—I would say because of my teaching-blocks experience" (Participant 6).

Seven of the 20 participants who felt they lacked integration training stated that most knowledge they gained on the topic was through peer interactions. One student suggested that, "usually our professors don't talk about it as much, but it's more everybody in your table group" (Participant 17). Moreover, another student stated her knowledge base came from her associate teacher: "I did talk about it when I was in my teaching block with my associate it's not something I talk about often" (Participant 13).

Finally, this student credited her knowledge on curriculum integration to her colleagues: "it is more like desk talk with umm, your colleagues. … I think I have learned more about integrated curriculum through that, the informal …conversations than formally in school" (Participant 23).

Perceived Lack of Applicable Training. Nine of the 20 students found that the assignments they did complete in university were not applicable to the real-world. Some students attribute this to the requirements of their assignments:

> We had to fit three additional, areas of the curriculum into one science lesson it became, the lesson became very unclear and the task didn't make sense because we were just trying to shove so many things into it, and it was very unrealistic and the lesson was—it would never work in real life—it was just for the assignment" (Participant 15).

Another student stated, "I would never use it in a classroom—did we get a good mark? Yea. Did it flow? Okay, yeah but really was it innovative? No. Are students going to want to do this unit? No." (Participant 4). Other students would simply point to the notion of these units not working in the real world: "it's not like oh how does this actually play out in a classroom because the lesson plans that we created before having block, those would not work in a classroom" (Participant 10).

Perceived Lack of Clarity and Depth in Training. Twelve of the 20 participants proposed that their integration training in university lacked clarity and depth. Many pointed to the notion that they did not receive enough practical examples in their classes, "I know they talk about integrating curriculum. I would be hard pressed to find an example of them showing me an actual example" (Participant 1). Another example:

> I think it would have been more effective if [the instructors] further explained actually examples of how you could potentially do it so we had a basis to go off of. I know a lot of us are kind of struggling and just rush through the assignment and try and connect the ideas without actually thinking about full on applying it in our classrooms, I wish we had a better description of it. (Participant 14)

Finally, this student simply stated that he wished "they would just give more examples … something tangible to hold on to" (Participant 22).

Some students simply stated that they needed more guidance in their assignments: "I didn't think that we received that much guidance. …. It was kind of us just winging it" (Participant 20). Another student stated, "we're usually required on our assignments to add ... different areas of the curriculum in, but we're not really taught how to do it" (Participant 15). Similarly, one student indicated, "we've talked about it but I don't think we've actually really examined it or put it into practice, we had one class I think on integrated curriculum but it was like create one unit plan for it" (Participant 10). Lastly, when discussing a course taken in university, this student claims, "we had to do a curriculum unit or curriculum final project. My group was kind of left out- we didn't really know what we were doing, we asked questions, didn't get the clearest ah guidelines so we kind of ran with it ourselves" (Participant 1).

Group Projects as Hindering Learning. Five of the 20 students suggested that the integrated curriculum group projects took away from their overall learning of the topic. One explained why she would not integrate on her own: "We had that one course but we work on it as a group, so I don't feel confident integrating curriculum on my own" (Participant 18). Similarly, another student suggested that she, "feels like I didn't really have confidence in ours because it was such a big group and literally we were just like,

okay this person does this, this person does this, throw it together and get it done as quick as possible" (Participant 25). Thus, participants suggested that in breaking the workload into sections, it took away from their overall knowledge of how to integrate: "if you are in a group with a whole bunch of people … okay section off everyone does a lot and soon we will come back together and it will be fine" (Participant 25).

Curriculum Integration Discussions. However, 11 of the 25 participants reported that their university training has frequently discussed curriculum integration. One student stated, "I think this year especially we've talked about it a lot … we talked about it a lot there (a fourth-year course) and then through developing some unit plans we talked about how to integrate it" (Participant 19). One student noted, "it's really heavily emphasized in the teachers' college experience right now" (Participant 3), while another explained, "every year we have talked about the importance you know finding any opportunity to cross your curriculum into other subjects and stuff like that" (Participant 21). Finally, another participant said: "I feel it is an idea that has been pushed on us in the program quite a bit" (Participant 5).

Integration Projects. Ten out of the 25 students could recall specific curriculum integration projects that they had completed in their university career. One student recalled a unit he made in a group this year in teachers' college: "this semester, we in science, we had to integrate two other topics" (Participant 18). Another student discussed a unit plan he made in fourth year: "I had to do um ... phys. ed. unit plan and we integrated drama and language so I think there was one written response and they were gonna be marked on language and then a skit on healthy eating or something like that" (Participant 19). Another student discussed "a unit plan project actually and we spent a whole lesson on unit planning and figuring out big ideas and then what expectations from

all the curriculums went to it so that was very helpful" (Participant 8). Finally, a student brought in a book to the interview that she had bought for one of her classes and said: "this chapter 3 with backwards design was really about integrated curriculum and then we did some activities with clustering expectations" (Participant 8).

Dependent Upon Program. Six out of the 25 students interviewed proposed that the level of curriculum integration training is dependent upon the program that the student is in. Four of these students suggest that those who took Drama in their undergrad have more integration experience than those who did not. For instance, one student insists, "my minor is in, um, drama and education and that was all about integrating arts with another curriculum so I think I had a really rich experience" (Participant 11). Similarly, another student says:

> I have taken a couple of Drama Education courses … and in those courses we just kind of learned different Drama strategies but they are not, we never focused on Drama expectations … in my undergrad they were probably the most beneficial courses I took. (Participant 20)

Chapter Summary

Chapter 4 examined the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. It also assessed whether teacher candidates have a base knowledge of curriculum integration. Each of the three primary research questions were considered according to a set of qualitative data sources.

This chapter introduced the four themes produced from the interview responses of the teacher candidates: definitions; buy-in; experiences with integration; and

preparedness. Then, the chapter distilled the results that fit under each specific theme. The definitions ranged from students referring to the combination of topics, subjects, and/or strands in lessons and/or units to uncertain responses. This section then discussed how students defined curriculum integration in relation to the term “cross-curricular.” Then, the chapter examined how teacher candidates would define the term using two subjects only. Next, the second theme, buy-in, was examined as participants discussed both the perceived benefits and hindrances of curriculum integration. It also examined the importance teacher candidates placed on authentic or meaningful connections while integrating. Next, the theme of preparedness was explored as participants explained why or why not they would feel comfortable integrating curricula on their own upon graduation. These responses ranged from prepared, to unsure, to not at all ready. Finally, the last theme pertaining to experiences with integration presented accounts of curriculum integration from participants or lack thereof. Some reported to have integrated themselves, to have witnessed integration, and some had no experiences whatsoever to recall. This section also addressed the degree of curriculum integration training that the participants experienced in their university careers.

CHAPTER FIVE: SUMMARY, DISCUSSION, IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

This chapter provides a study summary and discusses the results of the current qualitative study. Further, this chapter presents an overview of the practical implications of the results and discusses the limitations of the research. After suggesting recommendations for future research, the chapter concludes with a brief summary.

Summary of Study

The traditional discipline-based curriculum separates bodies of knowledge into distinct, separate information units called subjects/disciplines. This traditional discipline-based curriculum design has dominated schools for decades now (Hooper et al., 2014; Merritt, 2008; Park, 2008; Taber, 2014). Originally, it was intended to produce assembly-line workers to complete tasks correctly; they had no use for analyzing, questioning, or creating (Willis, 2011). Yet, in the 21st century, more and more knowledge is becoming multifaceted and connected (Costley, 2015; Drake et al., 2015; Klein, 2004; Marshall, 2005; Parsons & Beauchamp, 2012). There is an increase in global interdependence, pace and complexity, technological advances, bodies of knowledge, interconnectedness amongst complex systems, and a need for employees to draw from a variety of fields to solve problems (Lake, 2000; Russell-Bowie, 2009; Steiner & Posch, 2006; Stein et al., 2008).

Thus, many educators and scholars alike believe that curriculum integration is the direction that education needs to be moving toward; that is, looking at learning as a whole rather than separating it into categories and disciplines. In recent years, integrated curriculums have been adapted in some countries around the world, yet in a piecemeal

fashion. Specifically, in Canada we are also seeing a push toward adapting integrated curriculum practices in places such as Prince Edward Island and British Columbia.

However, in-service and pre-service teachers receive little or no training in curriculum integration upon graduating university, which makes them ill-prepared to implement this strategy (Chávez et al., 2015; Chrysostomou, 2004; Drake et al., 2015; Harrell, 2010; Hurley, 2001; Kim & Aktan, 2014; Zhou & Kim, 2010). Curriculum integration also lacks universality and clarity in both theory and implementation (Hayes, 2010; Russell-Bowie, 2009; Zhou & Kim, 2010). Thus, the term has become a source of confusion and anxiety which causes educators to avoid the approach altogether (Park, 2008; Parker et al., 2012). Scholars claim than an integrated curriculum will not be successfully adapted worldwide unless curriculum developers emphasize and lay out specific connections that can be made between the disciplines and how to do so (Park, 2008; Parker et al., 2012). Thus, the need for instructional practices that motivate and engage students' learning is of upmost importance.

Taking these concerns into consideration, the current qualitative study examined the integrated curriculum approach to teaching and learning. More specifically, the study reviewed the amount of curriculum integration training received by teacher candidates of the university in completing their final year of schooling. The primary purpose of this study was to determine the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. The study also revealed the knowledge base of curriculum integration that these teachers had acquired during their university career. The participants consisted of 25 teacher candidates from both

concurrent and consecutive programs at a university in Ontario. These teacher candidates were asked a total of five questions pertaining to curriculum integration in an interview with the researcher. These interview questions invited the participants to comment on their knowledge of curriculum integration, along with their training, comfort levels, and teaching experiences. Data were collected solely through these interviews which were then analyzed to identify patterns within responses.

This qualitative study has the potential to determine whether teacher knowledge and training is effectively preparing them for curriculum integration upon graduation. The study suggests that the teacher candidates are insufficiently educated and trained in curriculum integration, which will hopefully bring awareness and improvements to curriculum and teacher education programs/resources in the future. Ideally, the Ontario Ministry of Education would revamp the provincial curriculum to an integrated model rather than disciplinary. Yet, more realistically, the study encourages the Ministry of Education to create standardized documents on integrative studies that provide teachers with specific integration topics, examples, and resources.

Discussion of the Results

The purpose of primary research question 1 was to discover whether or not teacher candidates had a base knowledge of curriculum integration. The results indicated that the majority of students referred to the combining of subjects, topics, and/or strands into lessons and/or units to define the term. Moreover, some students referred to the natural intersection of curriculum in their answers. De Araujo et al. (2013) found comparable trends when examining high school math teachers' definitions of curriculum integration. The authors came up with a "Conceptions of Integrated Mathematics

Curricula Framework" describing the varied perceptions held by the teachers in their study: interdisciplinary integration, integration by strands, integration by topics, and contextual integration. Thus, most teachers seem to recognize that curriculum integration can be executed using a variety of techniques and strategies.

Almost half of the participants referred to the term "cross-curricular" when defining curriculum integration. Some were even so familiar with the term "cross-curricular" that they were unclear of its relation to the term "curriculum integration." Others viewed the two terms as unrelated altogether. Overall, the student responses suggested that the relationship between the term "cross-curricular" and "curriculum integration" is ambiguous. Not one of the 25 participants indicated that cross-curricular integration is simply a mode of integration—even those who were the most familiar with it.

As mentioned earlier in this chapter, all but two of the participants defined the term by simply discussing two subjects being integrated as examples. Brand and Triplett (2012) conducted a comparable study in which they examined pre-service teachers upon graduation and they concluded that most of these first-year teachers could only make connections between two disciplines. Additionally, all but four of the teacher participants discussed curriculum integration as utilizing one subject as a means to teach a concept in another; that is, they referred to curriculum integration as a pedagogical method to develop student learning in a corresponding subject. Kakas (2010) argues that meaningful learning can still take place using this cross-disciplinary mode of integration without devaluing or diluting either subject. Moreover, Judson and Sawada (2000) found that student academics in mathematics are improved when mathematical concepts are integrated into scientific activities.

Finally, the results found that when participants would discuss curriculum integration between two subjects, all but four of the participants would include a subject from physical education or the arts and humanities. Many of the participants attributed this incorporation to their educational background in the arts or physical education. Many of the teacher candidates also addressed the benefits of incorporating physical education and the arts and humanities when integrating two subjects. Numerous studies mirror this finding as well, such as Kakas (2010) who found that student learning heightened when bringing arts into the social studies curriculum. Zwirn and Fusco (2009) conducted a study that found art and literature to be an effective mode of integration on student learning. Finn and McInnis (2014) incorporated physical education to teach science concepts and found it to be both engaging and motivating for student learning. Similarly, Parker et al. (2012) utilized the arts to teach scientific concepts which developed student learning in both subjects. Trent and Riley (2009) effectively incorporated the arts into multiple subject areas which improved student engagement and self-efficiency. Vitulli et al. (2013) explored the Arts in Education grant program which proved to be an effective form of integration as well. Finally, Russell-Bowie (2009) conducted a study known as the Community Harmony Project which integrated the arts into a variety of subjects. However, unlike the other studies mentioned, the students progressed academically in the arts only, and no improvements were found in the other outcomes.

Finally, the third primary research question inspected whether the teacher candidates would feel comfortable integrating curricula upon graduation or not. To begin with, it is important to note that 76% of students interviewed believed curriculum integration to be a beneficial strategy to use in the classroom. The participants addressed

both teacher and student benefits in utilizing this approach. Studies conducted by Crisan (2014), Wrightstone (1935), Yoon et al. (2014), Engin and Uygun (2014), Kim and Aktan (2014), Tsinopoulos et al. (2014), Tong et al. (2014), Russell-Bowie, (2009), Russell and Burton (2000), Doyle et al. (2014), Finn and McInnis (2014), Parker et al. (2012), MacMath et al. (2010), Brand and Triplett (2012), Hovland et al. (2013), Halverson et al. (2014), and Zhou and Kim (2010) have also affirmed the benefits that curriculum integration has on both student learning and teaching. They found curriculum integration to be motivating, engaging, relevant, and an effective teaching strategy for progressing student learning.

Twenty-eight percent of the participants also reported that they felt curriculum integration helps students better apply their learning to the real world. The Eight-Year Study (Lipka et al., 1998) along with other studies conducted by Kakas (2010), Russell-Bowie (2009), Russell and Burton (2000), Halverson et al. (2014), and Zhou and Kim (2010) found that integrating curricula helped students to better put their learning into real-life contexts.

However, just as the benefits of curriculum integration were highlighted by the participants, so were the hindrances. Twenty-four percent of teacher candidates accused the process of integration of being difficult to execute, hard to plan, and time consuming. A study by Kim and Aktan (2014) found that curriculum integration is challenging in regards to making connections between subjects, finding time to cover everything, and finding resources. Tsinopoulos et al. (2014) created an integrated program that took 8 academic years to change content matter, lecture structure, and materials. Moreover, Parker et al.'s (2012) study found that many teachers would rather use a traditional

approach to teaching as they expressed concern over reaching all of the curriculum objectives expected of them and discomfort finding meaningful connections between the disciplines. Finally, Brand and Triplett (2012) pointed to the difficulties new teachers face when implementing an integrated curriculum such as time constraints, lack of resources, and state and local mandates.

During the teacher candidate interviews, participants were asked if they would be comfortable integrating curricula on their own in a classroom setting upon graduation. Thirty-two percent answered that they would be comfortable, 16% said they would not be comfortable, and 52% gave a response that was somewhere in between the two choices. Therefore, the majority of participants were on the fence when it came to feeling prepared enough to integrate curricula upon graduation. Seeing as 76% of the participants regarded curriculum integration as beneficial to both students and teachers, there must be another reason why these teacher candidates feel unprepared to integrate on their own.

Two participants alluded to the idea of curriculum integration only being possible in a collaborative environment, which is a reoccurring theme in curriculum integration studies. The Eight-Year Study required the teachers to be collaborative and work together when implementing their new curriculum, a finding supported by studies conducted by Kakas (2010), MacMath et al. (2010), and Trent and Riley (2009). Some of these studies even reported that teachers found collaborating put them at ease (Brand & Triplett, 2012) and helped them to better understand other subjects (Phillips et al., 2009). Interestingly, four of the participants interviewed suggested that curriculum integration is unmanageable after elementary school. Yet, a study conducted by Crisan (2014) revealed that high school teachers were more interested than elementary school teachers in

utilizing the integrated curriculum program he created called the eTwinning projects.

Another focus of the interview data was the significance of teachers integrating with authentic or meaningful connections. Twenty-eight percent of the participants believed that having authentic/meaningful curriculum connections would determine the effectiveness of the lesson or unit. Likewise, the Eight-Year Study placed importance on learning being meaningful and co-constructed from student concerns and interests (Kridel & Bollough, 2007; Lipka et al., 1998). Russell-Bowie (2009) and Engin and Uygun (2014) conducted studies which also reveal the importance of integrating meaningfully.

Thirty-two percent of the teacher candidate participants commented on the assessment aspect of integrating curricula. Two stated that they feel uncomfortable with assessment and curriculum integration because assessment takes on a whole new meaning. The schools involved in the Eight-Year Study had to adapt new approaches to evaluation that sought to appraise and record student progress (Lipka et al., 1998; Pinar, 2010). Four of the 20 participants stated that they believe all of the subjects and expectations that are included in the integration must be assessed. In contrast, two of the students felt very strongly about not assessing all the subjects and expectations that are integrated.

Those who stated they would be comfortable integrating, attributed this comfort to their experiences with integration whether they discussed their placements or simply just observing it first-hand. Students who were in drama classes throughout their university career claimed that this degree, in particular, helped them feel comfortable integrating curricula. There were four teacher candidates who reported to not at all be comfortable integrating curricula upon graduation. These students attributed their unpreparedness to lack of knowledge, teaching experience, and curriculum integration training.

Which leads to the final primary question of how much training teacher candidates have received in curriculum integration during their university career. Twenty-eight percent of the participants reported to have never observed curriculum integration first-hand in both their schooling and teaching experiences—similar to what Parker et al. (2012) found in their study, which was 90% of students having a positive view of curriculum but only 14% with considerable experience with the approach. Moreover, 28% of teacher candidates in this study testified to have witnessed curriculum integration in their university placements and 52% reported having integrated curricula themselves for lessons and/or units in their placements.

A total of 80% of the participants interviewed commented on a lack of curriculum integration training in university. Some of the students who felt they lacked integration training stated that most knowledge they gained on the topic was through peer interactions. Others found that the assignments they did complete in university were not applicable to the real-world; other students attribute this to the requirements of their assignments. Finally, the majority of participants proposed that their integration training in university lacked clarity and depth. They pointed to the notion that they did not receive enough practical examples in their classes. Some students also stated that they needed more guidance in their assignments or that the integrated curriculum group projects took away from their overall learning of the topic. Finally, some students addressed the structure of education in general as the reason why curriculum integration is difficult for them to grasp. Thus, the majority of students interviewed felt as though their curriculum integration training in university was not adequate enough for them to feel prepared enough to implement this technique upon graduation.

In contrast, 44% of participants reported that their university training has frequently discussed curriculum integration. Forty percent of students could recall specific curriculum integration projects that they had completed in their university career. Interestingly, 24% of teacher candidates interviewed proposed that the level of curriculum integration training is dependent upon the program that the student is in. These students suggested that those who took Drama in their undergrad had more integration experience than those who did not.

Many researchers have conducted studies that point to the importance and even justification of teacher integration training, such as Yoon et al. (2014), Tong et al. (2014), Finn and McInnis (2014), Zhou and Kim (2010), Parker et al. (2012), Trent and Riley (2009), Park (2008), and Halverson et al.(2014). Some studies have even focused solely on teacher integration training by creating, implementing, and examining the benefits of teacher education programs. According to authors such as Doyle et al. (2014), Brough (2012), Vitulli et al. (2013), and Phillips et al. (2009), these programs can either make or break the curriculum integration unit and/or lesson. As stated by Brand and Triplett (2012) and Judson and Sawada (2000), the complications teachers face when implementing an integrated curriculum could be alleviated with proper pre-service integration training. Furthermore, studies conducted by Zhou and Kim (2010), Park (2008), and Harrell (2010) suggest that the more curriculum integration training teachers receive, the more knowledgeable they will become on the subject which would in turn affect the definitions provided by the participants in this study.

Implications for Integrated Curriculum Theory

The current study was fundamentally framed by Dewey's educational philosophy

of progressivism which encouraged the need to integrate curricula in teaching and learning practices (Crisan, 2014). Along with Parker, he asserted that integrated curriculum is a fundamental aspect of effective teaching (Hinde, 2005). Dewey proposed that the child learns naturally without separating topics or disciplines, and that schools should mirror this natural learning rather fragment it (Frazee & Rudnitski, 1995). Thus, progressivism encourages student-centered learning, the teacher as facilitator, collaborative learning, holistic education, experiential learning, self-imposed discipline, and schools as sites for social reform (Kretchmar, 2008; Parsons & Beauchamp, 2102). Dewey proposed that teachers find content and activities that interest the students which may have nothing to do with the disciplines (Chrysostomou, 2004). He advised that content be integrated in relation to its real-life relevancy in solving problems (Wraga, 1997). Finally, progressive education advocated for teachers to take responsibility in educating students about the inequalities and discrimination in the world, which cannot be done without transcending the disciplines (Bullock et al., 2002).

Taken together, I speculate that the results gathered from analyzing the base knowledge that teacher candidates have of curriculum integration may have tentative implications for the theory of progressivism. As mentioned above, the participants of this study described curriculum integration as the combining of subjects, topics, and/or strands into lessons and/or units. Moreover, almost half of the participants referred to the term “cross-curricular” when defining curriculum integration and the most prominent theme throughout the participant answers was defining curriculum integration by connecting two subjects total.

Thus, none of the progressivist theory behind the use of curriculum integration

was addressed by the participants. Although the participants touched upon the importance of meaningful learning and connection making, these answers did not include comments on student-centered learning, the teacher as facilitator, collaborative learning, holistic education, experiential learning, self-imposed discipline, and schools as sites for social reform (Kretchmar, 2008; Parsons & Beauchamp, 2012). Therefore, I speculate that the theory behind curriculum integration has been overlooked or the connection has not been clearly outlined to these students. Or, the students do not have a base knowledge of progressivism to even make that connection. Therefore, in order for curriculum integration to be applied effectively in schools, students need to gain a better understanding of progressivism and/or make the connection to progressivism. That is, Faculties of Education need to do a better job of making explicit connections between Dewey's Progressivism and integrated curriculum in order for students to have a rationale for implementing.

Implications for the Practice of Curriculum Integration

In this study, 56% of students interviewed had some idea of how to integrate curricula as they referred to the combining of subjects, topics, and/or strands into lessons and/or units to define the term. Next year, these teacher candidates could have their own classrooms and be expected to integrate curricula on their own effectively. Thus, teacher candidates graduating university entering the workforce need to have knowledge of curriculum integration if that is where education is headed. Another commonality found was students describing curriculum integration using the term "cross-curricular." However, none of these participants suggested that this is simply a form of curriculum integration. Thus, it is reasonable to suggest that teacher candidates are unfamiliar with

the various modes of curriculum integration. Likely, this confusion is due to the innumerous descriptions of these modes that do not always align with one another. The literature itself is unclear in its description of integrated curricula so the student answers mimic this perplexity. Therefore, the modes of integration need to be condensed and clarified so that teachers can become more familiar with them in order to effectively implement.

The results also indicated that most participants defined curriculum integration by means of two subjects total. Many referred to curriculum integration as a pedagogical approach to develop student learning in another subject, the most common "tools" being physical education, art, and the humanities. Thus, more research needs to be conducted in regards to the efficiency of this approach to curriculum integration. If utilizing subjects such as the arts and physical education helps to develop student achievement in a subsequent subject, then teachers need to be aware of this. Moreover, they need to be trained in this teaching approach (service connections) to better know what subjects to connect, where, and how in order to benefit their students.

Finally, the study found that only 32% of teacher candidates felt comfortable integrating curricula upon graduation. The students who did not feel comfortable recognized that their discomfort was due to lack of training and teaching experience. Consequently, teachers need to be given the opportunity to integrate curricula before they graduate teachers' college. That is, Faculties of Education need to include more practical opportunities for teacher candidates to engage in curriculum integration and their associated instructional strategies. Teacher candidates also need to be given the base knowledge of curriculum integration in order to feel comfortable and effectively integrate

on their own. If they continue to graduate while feeling unsure of their ability to integrate curricula, they will be more likely to shy away from trying and/or not effectively integrating.

Curriculum integration pre-service training programs are being discussed and developed across the globe. Scholars emphasize the importance of teacher collaboration when integrating curricula (Phillips et al., 2009; Vitulli et al., 2013). They also suggest that teachers need to be provided with resources, guidance, materials/resources, support, and lesson plans in order to effectively integrate (Crisan, 2014; Phillips et al., 2009; Vitulli et al., 2013). Finally, studies advocate for hands-on learning experiences integrating curricula so that teachers become familiar and comfortable with integrating curricula (Akerson & Flanigan, 2000; Chiatula, 2015; George & Jinyoung, 2010).

Study Limitations

The present study intended to examine the degree of curriculum integration training teacher candidates had received during their university career as well as their comfort levels in implementing curriculum integration upon graduation. It also assessed whether teacher candidates have a base knowledge of curriculum integration. Although the study had the potential to gather extensive and descriptive accounts of one group of teacher candidates' thoughts, feelings, and experiences with curriculum integration, the results of the analysis may not reflect other groups. Thus, further research with a larger sample size that incorporates quantitative methods would be necessary to verify whether the findings from this study would generalize elsewhere.

The participants in this study also had diverse educational backgrounds and teaching experiences that could have affected their answers to the interview questions. To

begin with, the study was gender-biased as 20 of the participants were female and only five were male. Also, some students were in the concurrent education program whereas others took the consecutive route. Consequently, those who took concurrent education were required to complete education courses throughout their undergrad- some of which were focused on curriculum integration. All of the participants interviewed were in their final year of teachers' college however some were required to take 2 years of teachers' college and others just one which has implications on their training and teaching experiences. Additionally, one of the 25 students' was interviewed earlier in the year so he had not yet gone into his first teaching block. The others had completed their first teaching block but not their second yet so interviewing them after this experience would have affected their answers as well. The teacher candidates also had varying qualifications such as primary/junior, junior/intermediate, and intermediate/senior with equally inconsistent teachables (majors and minors). Thus, these dissimilar qualifications would also affect their undergrad experiences.

It is also important to note that the participants had different educational experiences prior to university. That is, some were familiar with integration and others had never even seen it first-hand which holds implications for their answers. One of the teacher candidates even admitted to looking up curriculum integration on the Internet before the interview because she admitted to not knowing what the term was. The researcher first went into classrooms to introduce the study and ask for participants. Then, the participants contacted her and they arranged a time and place to meet to conduct the interview. Thus, it is possible that some of the interview answers were assisted by research prior to answering the interview questions.

Finally, given that the researcher went to education classes to introduce herself and her study and administered the teacher candidate interviews, it is possible that her presence may have influenced the participant responses. Moreover, potential biases from the researcher must be considered since preconceived notions about curriculum integration may have inadvertently influenced the interpretation of the interview results. The researcher may have unintentionally focused on the positive experiences associated with curriculum integration over the negative. Thus, this study is somewhat limited by the researcher's interpretations and potential bias.

Recommendations for Future Research

The current study was a qualitative examination of the knowledge base acquired by teacher candidates in their final year(s) of teachers' college. Moreover, the interview responses provided evidence on the training received by these students as well as the preparedness they felt integrating upon graduating university. Considering the results of this study and De Araujo et al.'s (2013), the majority of students refer to the combining of subjects, topics, and/or strands into lessons and/or units to define the term curriculum integration. Thus, it would be important to determine how each form of integration shapes the curriculum and student–teacher experiences.

Since numerous studies, as well as this one, have recognized the value of integrating physical education along with the arts and humanities, future research could explore these service connections and what disciplines integrate best together, how, and why. Moreover, simply analyzing whether integrating solely two subjects together is more effective than multiple; that is, evaluate the effect of each curriculum integration mode on both student and teacher experience.

Finally, this study explored the degree of training that teacher candidates had received prior to graduating teachers' college. It found that not many teachers felt fully comfortable integrating curricula upon graduating university. Other studies conducted by Doyle et al. (2014), Brough (2012), Vitulli et al. (2013), and Phillips et al. (2009) focused solely on teacher integration training and found that this influenced both teachers and student learning in a positive way. Thus, future research could be conducted to determine whether there is a correlation between teacher training and the success of an integrated unit. Moreover, analyzing whether student achievement improves when the teacher has received training would be valuable. Furthermore, since countries such as Canada are adapting curriculum integration strategies, it would be beneficial to determine the most effective programs, strategies, and classes to teach educators how to integrate curricula, and likewise determining if the teacher training programs in place are effectively preparing teachers to work with integrated curricula upon graduation or not. In order to see a widespread, effective educational shift towards integration, we need all areas, including teacher training, to adapt to and prepare for this new way of teaching as well.

Chapter Summary

Chapter 5 summarized and discussed the results of this qualitative study. The chapter explained that 56% of students interviewed had some idea of how to integrate curricula as they referred to the combining of subjects, topics, and/or strands into lessons and/or units to define the term. Another commonality found was students describing curriculum integration using the term "cross-curricular." The results also indicated that the most prominent theme throughout the participant answers was defining curriculum integration by means of two subjects total. Many referred to curriculum integration as a

pedagogical approach to progress student learning in another subject, the most common "tools" being physical education, art, and the humanities (service connections). Finally, the study found that only 32% of teacher candidates reported feeling comfortable integrating curricula upon graduation. These students attributed their discomfort to both lack of training and lack of teaching experience.

The chapter also discussed this study's potential implication for theory. The current study was framed by Dewey's educational philosophy of progressivism which encouraged the need to integrate curricula (Crisan, 2014). However, none of the progressivist theory behind the use of curriculum integration was addressed by the participants in the study as the participants' answers did not discuss student-centered learning, the teacher as facilitator, collaborative learning, holistic education, experiential learning, self-imposed discipline, or schools as sites for social reform (Kretchmar, 2008; Parsons & Beauchamp, 2012). Therefore, I speculate that the theory behind curriculum integration has been overlooked or the connection has not been clearly defined to these students. Another possibility is that the students do not have a base knowledge of progressivism to even make that connection. Therefore, in order for curriculum integration to be applied effectively in schools, teacher candidates need to gain a better understanding of progressivism and/or make the connection to progressivism.

Next, the implications for the practice of curriculum integration were explored. This section discussed how the results of the study suggested that many teachers did not have a sufficient base knowledge of curriculum integration upon graduation, and they did not appear to be familiar with the various modes of curriculum integration. Thus, it was stressed that teachers need to become more familiar with the styles of integration in order

to effectively implement them. The results also indicated that participants defined curriculum integration by discussing two subjects in total. Many participants suggested that physical education, art, and the humanities be used as a tool to advance learning in other subject areas. Thus, this section urged that teachers are trained in this teaching approach (service connections) to better understand what subjects to connect, where, and how in order to benefit students. Finally, the study found teacher candidates to be not fully comfortable integrating curricula once they are in their own classrooms. Therefore, it was suggested that these teachers are given more opportunities to practice integration as well as learn about it in order to feel more comfortable doing so on their own.

Subsequently, the chapter discussed the study limitations. It is recognized that the study gathered experiences and opinions from one group of 25 teacher candidates**.** Consequently, their answers and results could very well be completely different from another group of teacher candidates even within the same school. Further research would need to investigate a larger sample size to verify the findings from this study. Moreover, the participants in this study had diverse educational backgrounds and teaching experiences which could have influenced their answers. Finally, the presence of the researcher throughout the study could have affected student answers as she was responsible for recruitment and interviewing. Lastly, the researcher's potential bias must be considered because she may have unintentionally focused on the positive experiences associated with curriculum integration over the negative.

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Appendix A

Letter of Invitation and Consent Form

Date [TO BE PRINTED ON BROCK LETTERHEAD]

Dear Teacher Candidate,

1. Please accept this letter as an invitation to participate in a research project entitled, *Determining the Degree of Curriculum Integration Training Received by Teacher Candidates* being carried out by Rachel Lowe, (a graduate student at Brock University). This study seeks to explore student readiness or lack thereof upon graduating to integrate curricula. Teacher candidates will be asked to take part in individual interviews to determine how equipped they feel to integrate the curriculum upon graduation.

You will be asked to discuss any experience you've had with curriculum integration training or lack thereof. Rachel Lowe, an education graduate student at Brock University, will facilitate the interviews. You will be emailed a copy of the interview prompts approximately one week before the interview for advance consideration. The interview will be audio recorded for subsequent analysis and scheduled at a time and place (i.e., quiet location on campus such a faculty office or library study room) of your convenience and is expected to range between 20-30 minutes in length. As the interview progresses, you may be asked questions for clarification or further understanding although the interviewers primary role will be to listen. Your interview will be transcribed by an experienced transcriptionist who has signed a third-party confidentially form. Your interview will be assigned a pseudonym or participant code. Approximately two-four weeks after the interview, you will be provided with an interview transcription as well as a synopsis of related themes for your review, with the opportunity to provide clarifications/edits or deletions. We anticipate that it will take no longer than 30 minutes to review these materials for each interview and request that your return your comments within two weeks by email to the primary student researcher (rl09cr@brocku.ca). The researcher will assume that your transcript is accurate if you do not respond within the two-week timeframe.

Participation in this study will have no bearing on your status as a current or future student and there is no evaluative or judgmental component to the study. Participation is voluntary and you may choose to withdraw from the study at any time and without penalty. You also have the choice of declining to participate or respond to any portion of the research study including any interview prompt. Should you choose to withdraw, your data will be immediately destroyed and any information collected will not be used in any way for the current or any future research.

We anticipate that participation in this study will be enjoyable and provide you with an opportunity to discuss and reflect on your personal pedagogy as related to curriculum integration. In addition, your responses will fill an important gap within the literature, providing insights to researchers and educators about the efficiency of teacher training in regards to integrating curricula.

If you have any additional questions about this study, please email Rachel Lowe (rl09cr@brocku.ca). We would like to assure you that this study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (file # XXXX-XX-XXX). If you have any comments or concerns resulting from your participation in this study, please feel free to contact Brock's Research Ethics Office, at (905) 688 5550 x 3035 or by email at reb@brocku.ca.

Thank you,
Rachel Lowe rl09cr@brocku.ca

PLEASE KEEP THIS LETTER FOR YOUR RECORDS

Informed Consent Form [TO BE PRINTED ON BROCK LETTERHEAD]

Date

Determining the Degree of Curriculum Integration Training Received by Teacher Candidates

Principal Student Investigator: Rachel Lowe,
rl09cr@brocku.ca

Principal Investigator: Dr. Michael Savage
msavage@brocku.ca

Dear Teacher Candidate,

Thank you for expressing your interest in participating in our research study examining the curriculum integration training received by Teacher Candidates.

WHAT IS INVOLVED

2. You will be asked to discuss any experience you've had with curriculum integration training or lack thereof. Rachel Lowe, an education graduate student at Brock University, will facilitate the interviews. You will be emailed a copy of the interview prompts approximately one week before the interview for advance consideration. The interview will be audio recorded for subsequent analysis and scheduled at a time and place (i.e., quiet location on campus such a faculty office or library study room) of your convenience and is expected to range between 20-30 minutes in length. As the interview progresses, you may be asked questions for clarification or further understanding although the interviewers primary role will be to listen. Your interview will be transcribed by an experienced transcriptionist who has signed a third-party confidentially form. Your interview will be assigned a pseudonym or participant code. Approximately two-four weeks after the interview, you will be provided with an interview transcription as well as a synopsis of related themes for your review, with the opportunity to provide clarifications/edits or

deletions. We anticipate that it will take no longer than 30 minutes to review these materials for each interview and request that your return your comments within two weeks by email to the primary student researcher (rl09cr@brocku.ca). The researcher will assume that your transcript is accurate if you do not respond within the two-week timeframe.

POTENTIAL BENEFITS AND RISKS

We anticipate that participation in this study will be enjoyable and provide you with an opportunity to discuss and reflect on your personal pedagogy as related to curriculum integration. In addition, your responses will fill an important gap within the literature, providing insights to researchers and educators about the efficiency of teacher training in regards to integrating curricula.

CONFIDENTIALITY

The information you provide will be kept confidential and you will be asked to select a pseudonym as part of the initial interview. This pseudonym will be used throughout the data collection phase as well as in the final written study. All potentially identifying information will be coded (and if necessary altered or removed) so that any identifying features (e.g., postsecondary affiliation, departments) will remain confidential. In other words, your name and any identifying information will not appear in any verbal or written materials related to this study, (e.g., reports, articles, presentations). Instead, anonymous quotations may be used with your permission. Audio recordings will be confidentially destroyed once transcription is complete. All written records, notes and other materials related to this research will be kept in a secured and locked cabinet in the principal investigator's office. In addition, all digital and electronic materials will be kept in password-protected file. The data will be retained for a period of seven years. Access to this data will be restricted to the principal student investigator, Rachel Lowe, and primary investigator, Dr. Michael Savage.

Participation in this study will have no bearing on your status as a current or future student and there is no evaluative or judgmental component to the study.

PARTICIPATION

Participation in this study is entirely voluntary. You are free to ask any questions about the research focus, methodology and your involvement at any time. If you wish, you may decline to answer any questions or to participate in any component of the study. Furthermore, and you may request that any information, whether in written form or on audiotape, be eliminated from the raw data. Finally, you may decide to withdraw from this study at any time, without penalty, with any data you provided being confidentially destroyed at that time.

PUBLICATION OF RESULTS

Results of this study will be used in conference presentations and publications. Participants will be sent an executive summary of the research findings by mail/email and they may also request copies of published articles.

If you have any questions about this study or require further information, please contact Rachel Lowe by email (vwoloshyn@brocku.ca). Please **do not** email Dr. Savage about any aspect of this study to maintain your confidentiality. This study has been reviewed and

received ethics clearance through the Research Ethics Board at Brock University (File #XX-XXX). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 ext. 3035, reb@brocku.ca. Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Informed Consent Letter. I have had the opportunity to receive any additional details I wanted about the study, and I understand that I may ask questions in the future. I understand that I may withdraw this consent at any time. I have checked here the component(s) of the research study that I wish to participate in at this moment, knowing that you may stop any aspect of your participation at any point.

Yes No Participation in Interview

Yes No I would like to receive an Executive Summary. Please send to the address below or use the provided email address.

Name: _____

Email: _____

Address: _____

_____

Signature: _____Date: _____

Appendix B

Interview Prompts and Guiding Questions

What does the term integrated curriculum mean to you?

Can you give me an example of a time where you saw it being used?

Through your course work, how much have you talked about integrated curriculums?
Can you give me an example?

Could you tell me about a time where you spoke about integrated curriculum?

Would you feel comfortable to integrate curricula on your own in a classroom setting?
If yes, what led to this confidence?
If no, why wouldn't you feel comfortable?

Appendix C

Letter of Appreciation

Letter of Appreciation & Resource List
[TO BE PRINTED ON BROCK LETTERHEAD]

Date:

Dear Former Teacher Candidate

3. Thank you for your participation in our study entitled, *Determining the Degree of Curriculum Integration Training Received by Teacher Candidates* on (insert date). Your time and effort are very much appreciated, and the information you provided was invaluable for developing our understanding of curriculum integration. We will provide you with an executive summary of the study findings after all the interviews and data analyses procedures have been completed.

If you have any further comments, questions, or concerns about the research study and/or related findings, please do not hesitate to contact us.

This project has been reviewed by and received ethics clearance through, the Office of Research Ethics Board (File #XX-XXX). In the event you have any questions or concerns about your participation in this study, please contact the Research Ethics Officer at 905-688-5550 ext 3035 or at reb@brocku.ca.

Sincerely,

Rachel Lowe
Rl09cr@brocku.ca
905-XXX-XXXX

Dr. Michael Savage
msavage@brocku.ca
905-XXX-XXXX

Appendix D

Feedback Letter

[TO BE PRINTED ON BROCK LETTERHEAD]

Exploring Concurrent Students' Evolving Perceptions and Stories of Mental Health and Wellness

Date

Dear Former Teacher Candidate:

We would like to thank you for participating in our study on (insert date) and for sharing your perceptions and experiences related to curriculum integration as your responses help to provide insight into teacher education programs and determine the best way to train our future teachers.

We have enclosed a copy of the executive summary report with this letter for your review. If you have any further comments, questions, or concerns about the study and/or the results, please feel free to contact us.

This project has been reviewed by and received ethics clearance through, the Office of Research Ethics Board. (File #XX-XXX). In the event you have any questions or concerns about your participation in this study, please contact the Research Ethics Officer at 905-688-5550 ext 3035.

Your time and effort are very much appreciated.

Sincerely,

Rachel Lowe
rl09cr@brocku.ca
905-XXX-XXXX

Dr. Michael Savage
msavage@brocku.ca
905-XXX-XXXX

Appendix E

Research Assistant and Professional Transcriber Confidentiality Agreement Form

Research Assistant/Professional Transcriber Confidentiality Agreement Form
[TO BE PRINTED ON BROCK LETTERHEAD]

Exploring Concurrent Students' Evolving Perceptions and Stories of Mental Health and Wellness

Principal Investigator: Dr. Michael Savage
Primary Student Investigator: Rachel Lowe

I understand that I have been hired to work as a Research Assistant/Professional Transcriber for a research project being conducted by the Faculty of Education at Brock University.

As a Research Assistant/Professional Transcriber, I am asked to respect individuals' rights to confidentiality by not discussing the contents of these documents in public, with friends or family members. The study and its participants are to be discussed only during research meetings with the researchers. As such, my signature below is my agreement to keep all data confidential and in safe keeping while it is in my possession. Specifically, I agree:

1. not to make or permit unauthorized access to this information

2. not to release confidential information to any person except permanent Brock project staff/ faculty members, as authorized by the principle investigator.

3. not to make personal use of confidential information which has come to me in the conduct of my university duties;

4. store all written records, audio recordings, notes and other materials related to this research in a secured and locked cabinet in the principal investigators' offices. In addition, all digital and electronic materials will be kept in password-protected files to which I will have limited access as granted by the principal investigator.

In signing my name below, I agree to the above statements and promise to ensure the confidentiality of the participants in this study.

Signature of Research Assistant/Professional Transcriber

_____ **Date** _____

Appendix F

Research Ethics Board Clearance Letter

Brock University
Research Ethics Office
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

Social Science Research Ethics Board

Certificate of Ethics Clearance for Human Participant Research

DATE:	5/16/2016		
PRINCIPAL INVESTIGATOR:	SAVAGE, Michael - Graduate and Undergraduate Studies in Education		
FILE:	15-244 - SAVAGE		
TYPE:	Masters Thesis/Project	STUDENT:	Rachel Lowe
		SUPERVISOR:	Michael Savage

TITLE: Teacher Candidate's Experiences with Integrated Curriculum

ETHICS CLEARANCE GRANTED

Type of Clearance: NEW Expiry Date: 5/31/2017

The Brock University Social Science Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from 5/16/2016 to 5/31/2017.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 5/31/2017. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at http://www.brocku.ca/research/policies-and-forms/research-forms.

In addition, throughout your research, you must report promptly to the REB:

a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved: K Maich

Kimberly Maich, Chair
Social Science Research Ethics Board

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.