

**AN EXAMINATION OF FINLAND'S EDUCATIONAL AND
MATHEMATICS EQUITY THROUGH
CRITICAL DISCOURSE
ANALYSIS**

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ABSTRACT

This investigation focuses upon the nation of Finland. Described by its Ministry of Foreign Affairs (“This is Finland”, n.d.) as a parliamentary democracy, Finland is a free-market economy with a young but progressive history. While the nation’s scores on the 2015 triennial PISA continue to indicate above average performance on all three domains, science, reading, and mathematics, inconsistencies were disclosed with regard to equity. Scoring above average on equitable achievement related to social background, which includes factors such as parents’ education and employment, Finland fell short regarding equitable achievement as it pertains to gender and immigrant students (“Compare Your Country, n.d.). This investigation will survey Finnish policy-related texts, education and mathematics curriculum, and Finnish artifacts; through the analysis of these texts, the intent is to determine how inequities and power dynamics are decipherable within these documents and potentially jeopardized students’ accessibility to mathematics endeavors. Fairclough’s interpretations and applications of critical discourse analysis will provide the foundation for analyses of Bourdieu’s notions of field, doxa, and habitus as they relate to Finnish equity and mathematics education and performance.

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CHAPTER 1: INTRODUCTION

The role of culture in mathematics equity is often overlooked when examining mathematics achievement and participation. As an instrument that disseminates power and capital to individuals and societies (Boaler, Altendorff, & Kent, 2011), mathematics equity must be scrutinized. Inequitable access, participation, and achievement in mathematics continues to be an international concern (Boaler, 2002; Boaler, Altendorff, & Kent, 2011; Holmes, Gore, Smith, & Lloyd, 2018; Le Roux & Adler, 2016). Several studies have acknowledged culture's role in mathematics and its contribution to mathematics procedures, practices, and their underlying inequities. Researchers have evaluated and compared nations' mathematics performance, policies, and equity as they pertain to mathematics (Kinard & Kozulin, 2008; O'Connor, 1998; Permeth & Dalzell's, 2013; Pais, 2013; Stigler & Hiebert, 1999).

In many of these inquiries, Finland is a country that has piqued interest with its unique approach, its emphasis upon equity, and its successful mathematics outcomes. Yet, while investigations of Finland's educational system, its distinctive infrastructure, and its classroom practices have been conducted through observation and interview, little research has focused solely on the political and curricular texts as they relate to mathematics and educational equity in Finland's basic and secondary educational systems. It is these political and curricular texts that are not only influenced by a culture's social and political initiatives, but subsequently, influence classroom practices and procedures (Boaler, Altendorff, & Kent, 2011; Pyhalto, Soini, & Pietarinen, 2011).

The accessibility of mathematics and its interplay within the nuanced cultures in which mathematics is situated needs to be more fully understood. Finland is a nation whose cultural establishment and educational progressions convey equitable intents. Through a socio-cultural

lens and critical discourse analysis, I will examine the nuances of Finnish culture that infiltrate its mathematics education and policy. I will attempt to identify the equitable facets that facilitate educational and mathematics success and diminish discrepancies in students' achievement; simultaneously, I will disclose any perceptible power dynamics or inequities within Finnish texts that may contribute to imbalances in accessibility, participation, or achievement.

Theoretical Framework

A common interpretation of mathematics is that there is an objectivity that distinguishes the discipline from others; yet with this view of mathematics, it is also construed as an isolated entity that is free of cultural influences (Pais, 2013). However, this perception is misleading. As with all other content areas, culture influences the exchange of mathematics. Researchers describe how sociopolitical demands create bounds within which the mathematics content must fit. Curriculum, which is a socially and politically constructed entity, dictates the instructional material and assessments that teachers present to their students. Therefore, mathematics acts as a *culturally bounded field of knowledge* (Pais, 2013, p.2), and it is grounded in the terms and associations bestowed upon it by the culture in which it is set: "Mathematics is everywhere from the moment we, people trained in mathematics, posit it to be everywhere" (2013, p. 3). O'Connor (1998) explains sociocultural theory of mind by describing an individual's thoughts as "an internal conversation with interlocutors, the general dimension of which originate in recurrent prior social interactions" (p.19). Defining thoughts in this Vygotskyan way, O'Connor suggests that thoughts are directly influenced by external discourse and interactions. If this is the case, then individuals' way of thinking about mathematics is influenced by the mathematics culture in which their instruction is set, and consequently, by the social and political constructs that shape this culture.

Therefore, it is important to understand the larger cultural, political and educational contexts from which these social practices and interactions stem. “If we consider a discourse practice as constituting the underpinning of a developing mathematical behavior, then access to that practice, or beliefs about it, or culturally conventional restrictions on its use will have consequences” (O’Connor, 1998, p. 33). By understanding the social and cultural interactions that can infiltrate students’ mathematics thinking and performance, an understanding of the accessibility and potential bounds may also be ascertained and allow for an equitable educational system. O’Connor’s (1998) mention of *access* alludes to the notion that culture can facilitate mathematics acquisition or serve as an agency that hinders students’ mathematics exposure and mindset.

Referencing the misalignment of the Western educational system with individuals’ cultural values and practices, Furuto (2014) advocates for mathematics education to consider students’ cultural backgrounds in response to achievement gaps. Pais (2013) takes issue with “the way mathematics is usually portrayed as being human-proof, as transcending all cultures, as well as the idea that it is ‘neutral’ knowledge, completely disentangled from social and political reality” (p. 2). Pais (2015) also notes that mathematics education should be considered beyond the scope of the student and the teacher and instead be situated within the wider organizational arrangements, which steer teachers’ and students’ work. In each instance, there is an appeal to expand the lens beyond the individual, and beyond the classroom, towards an examination of the educational infrastructure that infiltrates mathematics.

Bauerfeld (1995) notes that “participating in the processes of mathematics is participating in a culture of mathematizing” (as cited in Cobb, 1994). This perspective suggests that culture is at the crux of mathematics attainment. Cobb (1994) calls for the unification of the constructivist

and sociocultural perspective with regards to mathematics development. Discussing the processes for students' acquisition of mathematical understanding, Cobb (1994) explains students' internalization and "knowing" of mathematics as their tendency to meld their personal realities with the mathematics content. Saxe (1988) identified this reciprocity between the individual and culture in his observations and interviews with Brazilian candy sellers. Noting the social and cultural components that influence mathematics learning, Saxe (1988) recognized children's use and application of the currency within their selling practices with the application of both arithmetic and ratio comparison skills. One distinction, suggesting the role of the individual, was the difference in the complexity of tasks among the younger and older children. Older children tended to engage a greater variety of comparisons and problem-solving tasks in their sales, which indicated a developmental influence in their propensity to apply more complex mathematics. "Mathematics learning should be viewed as both a process of active individual construction and a process of enculturation into the mathematical practices of wider society" (Cobb, 1994, p. 13).

Significance of the Problem

This section describes the importance of the current educational and mathematics policy analysis. Influencing education as a whole, and more specifically, the content area of mathematics, I will describe the presence of cultural subtleties and their contribution to educational and mathematics assumptions, perceptions, and practices. Using Bourdieu's *habitus*, which Nolan (2012) describes as a way of being that "operates at various levels—in one's thoughts, actions, use of language, and in how one embodies experiences of structures and relations" (p. 204), I will discuss the potential influence that *habitus* has upon students' capital within a culturally produced educational and mathematics context. Following this, I will

demonstrate how capital contributes to students' educational and mathematics access, participation, and achievement; in doing so, I highlight the influence that culture has upon students' interactions within education, and more specifically mathematics, and I establish the rationale for a sociocultural approach to this inquiry.

Bartolini Bussi and Martignone (2013) acknowledge the underlying, but palpable, “implicit and explicit assumptions, some related to the images of mathematics and some related to more general worldviews, depending on the cultural background.” (p. 2). The authors point out that though there is ample research being conducted on mathematics, many reports lack inclusion of cultural considerations. The authors reference Pegg and Krainer's (2008) model of *The complexity of relationships in mathematics education*, which illustrates the extent to which culture impacts components of mathematics education, including mathematical theories and models, mathematics philosophies, mathematics standards, mathematics curriculum (intended, implemented, and attained), and lastly, mathematics achievement (Bartolini Bussi & Martignone, 2013). Jorgensen, Gates, and Roper (2013) use Bourdieu's notion of *habitus* to describe the influence of culture on learners' participation in mathematics; students' early interactions at home and immediate surroundings establish their *habitus*, which subsequently influences their engagement, activity, and interpretation of their environment. With this discussion of historical and cultural influences, the authors explain how this established habitus can also act as capital within school: “the children equipped with the right habitus are able to gain an advantage in school and can exchange their dispositions for other rewards” (Jorgensen, et al., 2013, p. 223). In relation to mathematics, which is described as a “gatekeeper” (p. 223), the researchers consider mathematics to be the field that is used as an indicator for success (or lack of success) in school; it is the discipline that separates learners, and it is a content area where inequities are markedly

identifiable.

Mathematics itself is not the root of achievement differences, imbalances in access, or the establishment of power dynamics. It is the enacted mathematics language, practices and approaches, embedded within the learning of mathematics, that manifest power within the mathematics field and lead to imbalance (Jorgensen, et al., 2013). From this perspective, “working class students are disadvantaged on entering the school field as they have less compatible habitus; this disadvantage manifests in underachievement in tests and in less impressive contributions in the classroom” (Jorgensen, et al., 2013, p. 237). This influence of power suggests that if habitus is acting as capital, then individuals’ mathematics achievement outcomes are not fully reflective of mathematics ability or potential; outcomes also reflect the alignment (or misalignment) of individuals’ habitus with environment in which *their* mathematics is set. Therefore, mathematics must be examined beyond the school setting and consider the larger, political, cultural and social context in which its structure has been established.

Cobb and Hodge (2002) defined equity as that which “is concerned with how continuities and discontinuities between out-of-school and classroom practices play out in terms of access” (p. 252). The researchers elaborate upon this notion by explaining that ascertaining certain mathematics and reasoning skills enables individuals to participate in a particular form of discourse that is crucial in the attainment of cultural capital (Cobb and Hodge, 2002). With regard to classroom practices and norms, particularly those within the discipline of mathematics, the authors first clarify the concept of a norm, emphasizing that a norm encompasses a collective activity and regards mathematics as a communal process – “the cultural capital of mathematics classroom is, therefore, a dynamic, emergent process (i.e., normative ways of reasoning,

speaking, and acting) in which students actively participate” (Cobb & Hodge, 2002, p. 267). The researchers also demonstrate how inferencing, a critical practice within mathematics, can subject itself to elements of power and authority. Describing scenarios of students’ divergence from the norms within a mathematics exchange, the researchers, Cobb and Hodge (2002) highlight the critical assumptions and misconceptions that are imposed upon individuals and their mathematics perceptions and abilities in these instances. For example:

A student who violates the normative ways of reasoning with tools and inscriptions that have been established by the classroom community is not merely viewed as having made an alternative mathematical interpretation. Instead, the student is positioned in a classroom discourse as not understanding how the world stands mathematically. Similarly, a student who violates the normative purpose for doing mathematics is positioned as not really doing mathematics. Further, a student who breaches normative standards of argumentation is positioned as failing to explain her reasoning adequately (p. 272).

In Cobb and Hodge’s (2002) argument, the researchers’ touch on several components related to culture’s role in mathematics equity. First, mathematics practices possess their own, unique set of tools and approaches in their implementation, and with these tools and approaches, are culturally assumed processes and purposes. Second, within each culture or community, mathematics has its own meanings, associations, and perceived functions. Deviation from these culturally associated mathematics norms may diminish individuals’ cultural capital and expose them to inequitable power dynamics within their learning environment. Boaler (2002) offers a specific instance involving the role of norms when she describes a three-year longitudinal study of 300 secondary students from two different schools. At the age of 13, the two groups of

students demonstrated no significant differences in mathematics performance, and there were no noted differences in mathematics performance among genders. However, three years after this initial baseline, when students followed one of two distinct mathematics routes, attending either a school that “followed a traditional, procedural approach” (p. 133) or one “where an open-ended project-based approach was employed” (p. 133) notable gender differences had manifested. For students who attended the more traditional school, girls scored substantially lower than boys on the national assessment; and, at the school where project-based instruction was more prominent gender differences were not noted. Boaler (2002) explains that, “girls at both schools sought deep, conceptual understanding of mathematics, and those taught by teachers who encouraged the exploration of mathematical ideas were able to achieve this goal” (p. 134). This provides an instance where a misalignment was present among girls’ way of learning and the mathematics culture in which they were being taught. At the school with the more traditional approach, girls were positioned in a way that diminished their cultural capital within the mathematics context and contributed to performance differences among genders.

Researchers agree that it is essential to expand the scope through which mathematics is viewed to incorporate social networks and practices outside of the classroom (Jorgensen, et al., 2013, Esmonde, 2009; Cobb & Hodge’s, 2002). A sociocultural framework allows for this broadened perspective with its recognition of the intertwined nature of culture and content areas, such as, mathematics. Embedded within sociocultural theory is an emphasis upon equity and a recognition of the influence of power and capital; students’ participation and practices in society and in their community (outside of school) must be acknowledged. This, along with the established practices within the mathematics classroom, must be considered in order to fully understand how power and capital impact educational and mathematics equity. Cobb and Hodge

(2002) state, “It is by aligning their [students] activities and interpretations with structures and purposes beyond the immediate community of practice that they create a place for themselves within wider society” (p. 265-266).

Purpose of the Study

The current inquiry examines curriculum documents, policy-related texts from government ministries, legislative acts and decrees, and social, editorial texts in order to determine the presence (or absence) of power within educational and mathematics ecologies in Finland. This study will also explore the practices and procedures of the Finnish culture, its educational system, and most specifically, mathematics instruction in order to better understand the role of the culture’s habitus in students’ equitable access and participation.

Wiley, Garcia, Danzig, and Stigler (2014) examined political contexts and their role in equitable education. Alluding to the presence of a power dynamic in the language of policy, the researchers described dominant languages as a channel for instruction (particularly in mathematics and science) and an aspect for consideration when examining education policies. Permuth and Dalzell (2013) provide an account of the social and political events that influenced the progression of mathematics standards in the United States. The researchers note how the standards, which drive mathematics curriculum, were not arbitrarily established; mathematics curriculum standards are the product of the nation’s policies, as well as social and political events. “Methodology for teaching mathematics responds to the directions of social change, economic pressure, and scientific and nonscientific progress because mathematics is central to a nation’s standing and power” (Permuth & Dalzell, 2013, p. 236). The authors describe how the onset of World War II and Sputnik brought about scrutiny to the educational system in the United States, particularly with regards to mathematics, science, and technology. These historical

events held political, social, and economic implications and emphasized the importance of establishing and maintaining mathematical competencies within education and society.

Malaty (1998) shares the origin of mathematics in Eastern and Western European cultures. When referencing “Eastern” education, his primary focus is upon Russia and when referencing “Western” education, he notes that he is generally alluding to the United States. With this article, he identifies the origins of the predominant mathematical culture in the 17th, 18th, and 19th centuries in Europe and describes it as one that initially assumed Euclidean concepts and conveyed unified beliefs and approaches of mathematics throughout Europe. Malaty (1998) then explains the movement in education that occurred in the late 19th century when education was made available to the general public throughout much of Western Europe and, to a degree, in Russia. He suggests that this surge in primary, and subsequently, secondary schools threatened the culture of mathematics as criteria for accepting teachers became less robust. “The principal problem within the new circumstances of mass education was precisely that of how to preserve the success gained through the provision of an elite education...” (Malaty, 1998, p. 426).

Malaty (1998) described a social shift that occurred in Russia with regards to education, and specifically mathematics:

a new variety of *élite* school, where *élite* this time means mainly private schools for the children of the *nouveaux riches*, expensive schools which can attract the best teachers by offering higher salaries than the public education system can afford (Malaty, 1998, p. 432).

More recently, Smolentseva (2016) examined Russia’s *attempted* social efforts to expand higher education to the masses. In her analysis of two methodologies, she notes the Russia’s high education system tends to replicate its social classes from one generation to the next and,

“Russia is among countries with an unequalising higher education system. Russia has a low representation of the lower educated group and substantial overrepresentation of the higher educated group” (p. 222). Despite the introduction of non-state, educational institutions and public, Russian educational divisions, some of which receive governmental funding, discrepancies remain among the Russian social structure and citizens accessibility to education.

Malaty (1998) and Smolentseva (2016) assert two key points. First, they demonstrate the influence that the social, economic, and political culture of a region can have upon mathematics education, and second, they reiterate the challenges with and the need to understand the systematic frailties that can impede the implementation of an effective *and equitable* mathematics education. Understanding the socio-historical components that have led to current educational realities is a critical aspect of policy analysis (Wiley et al., 2014). The constant reconstruction of cultural norms and practices, which are reflected in policy and broader political structures, affect the interactions that occur among the actors and systematic structures within which educational policies are set (Coburn, 2005).

In California, the path of major educational reforms began with challenges from universities, education professionals, and policy agents regarding the established teaching content practices. The inquiries of these progressive actors led to the state’s eventual adoption of a curriculum framework for literacy that subsequently infiltrated instructional materials, educator’s professional development, and standardized assessment measures (Coburn, 2005). The reconstruction of norms surrounding literacy influenced educational approaches and shifted the mindset of actors in this field. This path of reconstruction demonstrates that social actors and entities can influence the political arena, as this educational shift stemmed from educational institutions and educators’ inquiry of inherent practices; it also highlights how political responses

have the potential to then directly, and significantly, affect local educational practices and curriculum.

Apple (1992) links the strength of educational reform, specifically mathematics and science reform, to an understanding of the broader society and economics. Classifying mathematics and science as “high status knowledge” (p. 420), Apple (1992) stresses the dependence that both cultural and economic markets and products have upon this mathematics knowledge. However, from an economic perspective, Apple (1992) notes that the emphasis is not on the availability of mathematics knowledge to all, but instead (with an economic lens), the focus is on the availability of this knowledge to the degree to which the market demands. Because of this, Apple (1992) explains that this knowledge acts as “a commodity, a form of what Pierre Bourdieu (1984) calls *cultural capital*. Who has it, what social purposes it serves, the socially structured patterns of benefit that result” (p. 422). Therefore, in order to implement effective reform, that encourages equitable access to mathematics knowledge, Apple (1992) suggests that a greater understanding of the social functioning of mathematics knowledge is needed to facilitate transformation of the utility of mathematics knowledge within the larger social context. Weaver-Hightower (2008) also considers policy to be an “ecology” composed as texts and discourses that are positioned within the setting from which they were manifested and from which they were applied. With this, Weaver-Hightower (2008) indicates the examination of policy must extend beyond the politicians who developed the policy and beyond the teachers who implemented it in order to fully examine the processes.

Definitions of Terms

The following terms will be applied throughout the subsequent chapters of this inquiry and are defined below:

- **Equity**- equal physical and epistemological access to educational materials, participation, experiences, and achievement (Baker & Clark, 2011; Le Roux & Adler, 2016).
- **Field**- “a bounded [social] space in which there are determined [social and cultural] positions which: (a) held in relation to others in the field; (b) are differentiated in a hierarchy of power and status; (c) produce in occupants and institutions particular ways of thinking, being and doing” (Thomson, 2005, p. 742-743).
- **Habitus**- a way of being that “operates at various levels—in one’s thoughts, actions, use of language, and in how one embodies experiences of structures and relations” (Nolan, 2012, p. 204).
- **Doxa**- “a set of core values and discourses of a social practice field that have come to be viewed as natural, normal, and inherently necessary” (Nolan, 2012, p. 205).
- **Capital**: “the power granted to those who have obtained sufficient recognition to be in a position to impose recognition” (Bourdieu, 1989).
- **Semiosis**- “meaning making as an element of the social process” (Fairclough, 2013, p. 230).
- **Genres**- “semiotic ways of acting and interacting” (Fairclough, 2013, p. 232).
- **Discourses**- “semiotic ways of construing aspects of the world” (Fairclough, 2013, p. 232).
- **Styles**- “are identities, or ‘ways of being’, in their semiotic aspect” (Fairclough, 2013, p. 232).
- **Order of Discourse**- “the semiotic dimensions of (networks of) social practices which constitute social fields, institutions, organisations, etc.” (Fairclough, 2013, p. 232).
- **Power relations**- “relations of struggle, using the term in a technical sense to refer to the

process whereby social groupings with different interests engage with one another"
(Fairclough, 2001, p. 28).

CHAPTER 2: REVIEW OF LITERATURE

In order to understand the link between inequities in mathematics achievement and sociocultural influences, I will review two bodies of literature. First, I will briefly review the literature related to inequities in mathematics, beginning with the significance of mathematics and the incongruities between the demand for mathematics and individuals' participation. The remainder of this chapter will be devoted to literature pertaining to Finland, including its history, its educational development and progression, and its performance on the international Programme for International Assessment (PISA). Prior studies related to Finnish teachers' and students' educational and mathematics experiences, research on the Finnish classroom environment, the content area of mathematics, special education, and multicultural education within Finland will be addressed. The intricate dynamic between local educational structure, policy, and the greater political, social, and economic environment will be explored, and Finland's ability to evade policy trends within the international education community will be acknowledged. This chapter will culminate with a discussion of particular Finnish policies, the nation's reaction and interaction with political trends in education, and the intents for this inquiry.

Inequities in Mathematics

The Significance of Mathematics

Ernest (2002) examines the potential *empowerment* associated with the acquisition of mathematical understandings. The author categorizes *empowerment* in three ways –mathematical empowerment, social empowerment, and epistemological empowerment, suggesting that mathematics can facilitate the transfer of power to one individual or group. “Qualifications in mathematics are accorded a privileged role and have unique social significance via these

‘gatekeeper’. The use of mathematical qualifications as a ‘critical filter’ controlling entry into higher education and higher paid occupations has long been noted” (p.4). Describing mathematics as a *vehicle* for social and economic mobility, and acknowledging this role in many instances of empowerment, Ernest points out that mathematics is embedded within the fundamental structures of our modern society. Mathematics, and quantification, is a lens through which we view many facets of our world; everyday instruments, such as calendars, clocks, and measurement tools, as well as systematic structures, including taxes, currency, insurance, and pensions, involve mathematics.

Researchers highlight the increasing role of technology within our society and its concurrence with the increasing demand of mathematics, as mathematics underlies the functioning of computers. “Mathematics is pervasive and invisible” (Gravemeijer, Stephan, Julie, Lin, & Ohtani, 2017, p. 107), and the authors point out that in today’s digital society, employees must be able to interact with the machines that they are partnered; in order to generate an input and analyze an output, individuals must have an understanding of the mathematical concepts and calculations embedded within these machines that allow for functioning and utility. Hanushek, Peterson, and Woessmann (2012) note that a country’s international test results in mathematics and science relate to its gross domestic product rate of growth. This interconnectedness demonstrates the economic influences of mathematics and the necessity for the nations to maintain mathematical competency in order to sustain and improve their economies. Permuth and Dalzell (2013) describe mathematics as “the fulcrum that develops and translates science into reality” (p. 235).

Ernest (2002) extends the perception of mathematics beyond that of a *tool* or *mechanism* and proposes that mathematics is a rendering of societal emphases and values: describing that

economics “is not merely a neutral description of the flow of resources. It also represents a perspective that maintains the status quo, dehumanizing discussions of military expenditure, social welfare, world debt, etc.” (p. 7). With this point, Ernest explains how mathematics allows individuals to be critical citizens within society. Mathematics facilitates individual’s ability to decipher information, elevating their positioning and allowing them to question and make decisions within the contexts of their worlds.

Rising Demand and Falling Interest

Holmes, Gore, Smith and Lloyd (2018) described students’ lack of interest in science, technology, engineering, and mathematics (STEM) careers and the essential role that *mathematics* has within STEM careers. The increasing demand for STEM careers within the workforce, in conjunction with the declining interest in these fields, is concerning. The researchers’ findings held implications related to mathematics directly, “Our findings reveal a dire lack of interest in, or possible lack of knowledge of, careers that focused on mathematics” (p. 672). The authors noted that students’ perception of themselves as learners of mathematics impacted their achievement and affected their pursuit of a STEM career. Gender, cultural capital, and prior achievement in numeracy were also among factors that are associated with students’ STEM-related aspirations (Holmes, et al., 2018; Boaler, 2002). Specifically, the researchers’ found that males were more likely to strive for a STEM-related career than females, and students with greater cultural capital and those with higher numeracy achievement were also more likely to pursue a STEM-related career. These findings demonstrate how gender and cultural capital can contribute to the manifestation of power imbalances which contribute to individuals’ participation in science, technology, engineering, and mathematics.

Achievement Differences in Mathematics

Boaler et al., (2011) identified discrepancies in participation and achievement in mathematics and science by looking specifically at gender, ethnicity, and socioeconomic status (SES) within the United Kingdom. For example, although girls demonstrated high performance in mathematics, their low participation in higher-level mathematics courses highlights a gender gap. When comparing countries, England and Wales had lower female participation in higher-level mathematics than Northern Ireland and Scotland, suggesting that more equitable opportunities are available in the latter countries. Additionally, students with a lower SES demonstrated lower achievement and, subsequently, lower participation in mathematics, as past achievement is the primary factor in determining students' continued participation in the discipline (Boaler et al., 2011). Differences were also found among ethnic groups and within content areas. With regards to mathematics, Chinese students had the highest participation, followed by Indian, Pakistani, and African students, and White, British students had the lowest mathematics participation.

Furuto's (2014) study reiterates the presence of mathematics discrepancies among ethnically and socio-economically diverse populations in his examination of the Hawaiian education system. The Hawaiian population has approximately 30% of students in poverty, and one of the most diverse populations in the United States; "Caucasian students make up less than 20% of the public school enrollment. The breakdown is Hawaiian (25%), Filipino (19%), Japanese (12%), Korean (8%), and others" (p.5). While improvements have been noted in students' mathematics and science performance, the researchers describe how Pacific Islander and Native Hawaiians' mathematics and science performance remains considerably below that of their Caucasian and Asian peers. Le Roux and Adler (2016) cite inequities in South Africa's mathematics opportunities and programming despite the post-apartheid educational restructuring

that occurred over twenty years ago. “Students’ inequitable experiences of meaningful school mathematics take on new meanings at university. Although by 2010 four fifths of all South African university students were black, physical access to university has not guaranteed epistemological access and success” (p. 231). Though progress has been made in many realms, and recognition of mathematics inequities continue to ensue, the presence of barriers towards mathematics achievement and participation remains a pervasive, and international concern. Findings such as these suggest a need to explore equity in mathematics as it is, “regarded as difficult and attainable only by some” (Boaler & Greeno, 2000).

Boaler (2002) and Guitierrez (2013) identified changes that have occurred in sociocultural research. Sociocultural studies are shifting *away* from examining how individuals’ identities are adapted or reconstructed in particular contexts *towards* considering how the structures and power dynamics within which individuals’ identities are set can influence their learning. The researchers demonstrate this shift with their discussion of gender gaps in mathematics achievement during the ’70 and ’80s. During this time, research was primarily focused upon differences between boys’ and girls’ mathematics learning processes and achievement. Such a focus led to conclusions and interventions that attempted to have girls become more like boys. By examining the strategies that facilitated boys’ success with mathematics tasks, the focus remained upon changing one gender to be more like the other with little consideration of misalignment between the individual and the context. With these shifts and consideration of how the structures and power dynamics impact individuals’ learning, researchers “privilege the voices of the subordinate groups and forefront the politics and power dynamics that arise from sites of interaction (Guitierrez, 2013, p. 39).

Finland

One nation that has captured the world's attention over the past two decades with its high mathematics rankings on the Programme for International Assessment (PISA) and its emphasis on equity is Finland. Despite its late start, and the many hardships it overcame throughout its history, Finland is a nation that has surpassed many of its more established, international counterparts on mathematics achievement assessments (Sahlberg, 2011; Sahlberg, 2012; Simola; 2005). Its top performances have been consistently reflected in the Programme for International Assessment (PISA).

While instructional practices, classroom environment, and educational resources within the mathematics context are critical, “success of the education system is politically, culturally and economically intertwined with other sectors of society” (Aho, Pitkanen, & Sahlberg, 2006, p. 3). Therefore, it is helpful to *first* broaden our lens in order to understand the historical and cultural components engrained within the Finnish society and policy, in order to fully understand the mechanisms that have led to Finland's continued mathematics success. With Finland's complex history, it is important to examine its progression and the characteristics of its history that are infused within its educational systems: “Cultural activities, such as teaching, are not invented full-blown but rather evolve over long periods of time in ways that are consistent with the stable web of beliefs and assumptions that are part of the culture” (Stigler & Hiebert, 1999, p. 87). Therefore, instead of exploring societal events and policies in isolation, understanding the evolution of a country's educational system within the context of its history and culture, can assist with more fully comprehending its composition and fruition.

The Evolution of Education

Occupied by Sweden from 1155 to 1809 and struggling for its independence from Russia in the early twentieth century, Finland's culture and its educational foundation are infused with

traits from various regions. The first glimpse of education in Finland appeared in the form of the first alphabet in 1543. A century later, religious doctrines (endorsed by clergy) continued the nation's quest for literacy, and in the late 1600's, churches opened schoolrooms where clergy taught essential reading and writing skills to the local population. In addition to poverty and invasion, the Finnish region survived episodes of destructive famine in the late seventeenth century (Andere, 2014). Following this famine, which killed a quarter of Finland's population, two more famines struck the region within the next hundred years. Sahlberg (2011) describes Finnish history as a "story of survival" (p. 3), and this developing region engaged in a series of long, and arduous wars, including the civil war beginning in 1917, in which they gained independence from Russia. Though the nation shifted towards a German influence, it ultimately gained its autonomy and established a democratic state (Aho et al., 2006; Andere, 2014; Sahlberg, 2011).

Garcia Ruiz and Ciorida (2015) highlight the identifiable, and residual, influences of former political powers within the Finnish society, and specifically within its educational system:

Eastern influence has determined that the Finnish social democracy holds certain Eastern traces of an authoritarian and even totalitarian character when compared to other versions in other Nordic countries. Thus Finland's archaic, collective, and obedient mentality is a feature that permeates the schooling culture (p. 23).

Before its independence from Russia in 1917, Finland was an economically polarized society, with an affluent, elitist sector and an impoverished, rural population. Once liberated from Russia rule in 1918, the nation experienced both economic and political turmoil in subsequent years, yet educational progress ensued. With the adoption of a constitution in 1919, "laws on freedom of religion, compulsory education, and military service" (Aho et al., 2006)

were passed just two years later. Though compulsory education was enacted during the 1930's, and progressive notions were emerging within Finnish society, these notions had not entirely infiltrated the nation's educational structure. At the primary level, students' cognition was secondary to moral teachings, and Finnish education maintained formal and teacher-centered practices (Sahlberg, 2011). In 1934, one glimpse of education progress was the promotion of Jyväskylä, to the level of a university with education studies. Jyväskylä was the first training school for educators, established in 1863. Prior to its promotion to university status, only two years of study were required for teachers; with this change, educators participated in a program just below the equivalence of a Bachelor's degree (Andere, 2014, p. 51). Yet, before the progressive movement could more fully influence schools and classrooms, the nation faced another war, the Winter War.

This conflict lasted from 1939 through 1940 and was immediately followed by the Continuation War from 1941 to 1944. With an eventual reprieve from conflict, the nation was able to begin its social, political, and consequently, educational transformation: "It is difficult to understand why education has become one of the trademarks of Finland without examining Finnish post-WWII political and social developments" (Sahlberg, 2011, p. 4). With multiple stipulations in the peace treaty of 1944, Finland faced debt, communism within its political system, and the displacement of its citizens. These consequences of war left Finnish citizens wanting for social mobility; education was perceived as that channel, and it was considered to be the means to a steadfast, and successful future (Aho et al., 2006, p. 24).

In 1945, the Primary School Curriculum Committee was also established, and this government-funded committee transitioned Finland from an educational system focused solely on curriculum towards one that perceived education as a process with academic goals and

evaluative measures. In 1950, primary and middle schools were generally accessible only to those individuals who lived in towns. At this time, just over a quarter of 11-year old children were enrolled in schools that extended their education beyond six years of basic schooling. However, in 1950, government funding was made available to private schools and new schools were opened in order to cater to citizens' heightened interest in education. Vocational schools were incorporated into the educational system, and compulsory education included six years of primary school and either two years of civic school or promotion to grammar school. The School Program Committee, which ensured cohesion in the evolving Finnish educational system, was founded in 1956. Focus on equitable educational opportunities was echoed through much of the Nordic region. In 1959, criteria for compulsory education was once again altered, and a nine-year pathway, which is still a characteristic of the nation's educational infrastructure today, was developed. Education shifted from private entities to public civic establishments (Sahlberg, 2011, p. 4-8).

Political and Economic Influences

Throughout the 1950's and 1960's Finland was in the midst of economic and political transformations. The once agricultural nation was shifting towards a more industrialized economic industry. Cities experienced substantial population growth, and contrastingly, more rural regions were deserted. By 1960, enrollment in grammar schools was 215,000, compared to enrollment five-year prior, which had about 34,000 students. This surge in education enrollment continued throughout the decade. In 1961, the nation joined the European Free Trade Association: expanding its economic network beyond the Soviet Union towards Western economics (Aho et al., 2006).

Along with these economic shifts came political shifts throughout the nation. “Left-wing” parties became the majority in the 1966 elections, and with this, education reform became a priority for the Finnish administration (Aho et al., 2006, p. 31). In 1964, Parliament restructured teachers’ education in order to address the changing needs of the nation’s compulsory education system, and additionally, in 1966 the government implemented changes at the secondary level, particularly with regard to vocational pathways. “Every child deserved a good basic education, and it was up to the government to provide it regardless of family income, social status, or place of residence” (Aho et al., 2006, p. 35). Parliament demanded that education reform begin in the Finnish countryside, where it had previously been lacking, and the 1968 School System Act signified a series of educational transformations in Finland.

Among these reforms were changes and additions at the administrative levels. Administrative entities included The National Board of Education, The National Board of General Education, The National Board of Vocational Education, the Ministry of Education, the Cabinet of Ministers, and at a more local level, municipalities, school boards, and schools. Each of these agencies was (and is) responsible for decision-making, either individually or cooperatively, for various aspects of education. The time and allocation of curriculum, class-size, hiring teachers, teacher qualification, textbook control, establishment of schools, state funding, and budgeting are the primary domains in which decision-making is assigned. The roles and responsibilities of these national and local entities have shifted over time, but this reflects the autonomy and inclusion of more local entities in educational decision-making. In 1972, The National Board of General Education decided on the curriculum; however, as of 2005, this responsibility shifted to local school boards and The National Board of Education (Aho et al., 2006). This entrustment of decision-making is a systematic characteristic of the Finnish

educational and political structure that is unique to this nation, and the formation of its educational and political structure is better understood with an awareness and understanding of the nation's history and culture.

Sahlberg (2011) breaks Finland's educational progression into three main stages. The first stage, throughout the 1980's, consisted of systematic changes within the educational structure. During this phase, there was an emphasis on essential components of education including the construction of knowledge and learning, as well as teaching practices and content. The second stage occurred during the 1990's and Sahlberg describes this stage as a time when schools and municipalities took control of curricula and instruction. Collaboration and autonomy occurred at the local educational levels where teachers and school communities actively engaged.

The final, and present stage, involves maintaining an effective balance between the administrative and pedagogical aspects of the Finnish education system. Sahlberg (2011) notes that the Ministry of Education has reclaimed control of some areas of the educational system in order to ensure efficiency of the more managerial aspects inevitable in education, such as resources, structures, and indications of productivity. However, with this control, there still exists autonomy among Finnish municipalities. At this stage, maintaining this balance between the implementation of practical, present-day reforms, with sustaining components of an already successful system, is the focus (Sahlberg, 2011).

Programme for International Student Assessment

Though Finland's 2015 mathematics performance on the Programme for International Student Assessment (PISA) indicates a decline since 2006, its overall results suggest that the nation is demonstrating the ability to sustain its mathematics success. With performance scores

still among the highest of participating countries and economies, Finland obtained an average score of 511 compared to the Organisation for Economic Co-operation and Development's (OECD) average of 490 points (OECD, 2017); Finnish girls' performance ranked ninth out of sixty-nine PISA participants on the mathematics assessment. On the 2015 assessment, the nation also had one of the smallest percentages of low performers in mathematics, *and* "unlike most other countries and economies, the difference between girls' and boys' mathematics performance is small" (OECD, 2017, p. 1).

Created by the OECD, the Programme for International Student Assessment (PISA) is a triennial, international assessment that is administered to students ranging from the ages of 15 years and three months to 16 years and two months who have completed a minimum of six years of formal education. The test assesses students' performance in the three core domains of reading, mathematics, and science, and every three years an innovative domain, such as *collaborative problem solving* (selected for the 2015 PISA administration) is also included. During each triennial assessment, one of the three core domains is examined in detail, and this domain of focus comprises about two-thirds of the time for that administration (OECD, 2017a). During the 2003 and 2012 administration, mathematical literacy was the domain of focus.

The 2015 PISA (OECD, 2017a) defines *mathematical literacy* as:

Students' capacity to formulate, employ and interpret, mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. It assists individuals in recognizing the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens (p. 26).

Finland continues to score above the OECD average, but it is noted that the nation's average score dropped eight points from 519 in 2012 to 511 in 2015. Additionally, when comparing the administration of the PISA in 2012 with the 2015 assessment, it can be noted that the delivery of the exam shifted from a paper-and pencil format to a computer-based mode with 57 out of the 72 participating countries and economies using computers (OECD, 2017a; OECD, 2016; OECD, 2014a).

With equitable education as a primary focus in the compilation, administration, and analyses of the PISA assessment, the OECD explains that another primary intent of the PISA is to influence policy by allowing countries, and policy makers within those countries, to measure the performance of their students against those of other nations. In doing so, the PISA allows nations to establish goals based upon their outcomes and the outcomes of other educational entities while also gaining exposure to effective practices and educational policies (OECD, 2016a). "Naturally, the main interest of PISA is in its results: the country achievements, rankings and trends over time, the examination of equity, the links between performance and characteristics of schools and teacher" (Stacey, K. & Turner, R., 2015, p. xii)

In the OECD's (2016c) publication of the 2015 results, the international organization delves into the governance of school systems, assessment philosophies, and accountability measures that are exercised by political structures and educational entities. The OECD, the creator of the PISA, recognizes the complexity of policy formation, policy reform, and policy integration: "Simply devolving power to local authorities will not improve the functioning of a system unless it is also accompanied by attention to the connections and interactivity present" (OECD, 2016c, p.4). The OECD, and PISA's, acknowledgement of the need to understand the interactions of systemic, educational mechanisms is crucial to ascertaining the political and

educational connections that impact a successful, and equitable education. This perspective captures the socio-cultural stance: “According to Bourdieu, everyday decisions are made within a network of structures and relations, referred to as a field. These decisions shape and are shaped by a set of dispositions (habitus) that include attitudes, beliefs, perceptions, and practices” (Nolan, 2012, p. 204).

PISA, Mathematics, and Equity

Some questions as to whether Finland’s performance on international assessments was the result of an adept educational structure, or mere coincidence, have been posed; Andrews, Ryve, Hemmi, and Sayers’ (2014) work is one such example that challenges the implications put forth by the OECD with regards to the Programme of International Student Assessment (PISA) results. While the Organization of Economic Cooperation and Development asserts that strong performance on the PISA is indicative of economic growth, Andrews scrutinizes these claims and questions the strategies employed by PISA test developers. Andrews points out procedural deficiencies with regards to *double translation* and the present requirements of comparative research. Additionally, Andrew suggests that performance on the PISA may signify the alignment of a country’s curricula with that of the PISA assessment items. The researcher also notes that it is not only reflective of the alignment of content but also format and context.

While Andrews insinuates that PISA performance may be mere coincidence, he then moves beyond the assessment and identifies the common characteristics of successful educational systems; “They persuade the right individuals to become teachers, they enable those individuals to become effective practitioners; they ensure the best possible conditions for student learning” (Andrews et al., 2014, p. 9). Andrews describes the high-quality training that Finnish pre-service teachers receive. With this, research-based teacher education (RBTE) is a huge

component in several of the universities in Finland (Andrews et al., 2014). Not only do teachers attempt to link research to practice, but research is also used as a tool to encourage reflection, engagement, and pedagogical autonomy. Analysis of 2003 PISA data found that over a 31% difference in participating nations' performance was due to between-school differences; however, Finland's performance due to between-school differences was just above 5%. This is reflective of a societal cornerstone, which emphasizes equity for all (Andrews et al., 2014).

With regard to equity, the PISA also compares each nation in terms of gender, social background, and immigrant students. Minor, statistically significant differences in performance were present among Finnish boys' and girls' performance on mathematics. This was a consistent trend for Finland with girls outperforming boys in all three content domains: science, reading, and mathematics. When specifically considering Finland's mathematics performance on the PISA, the gender differences were relatively small as girls outperformed boys by only eight points. This finding contrasts PISA's overall results, which indicate that internationally, boys regularly perform better than girls on the mathematics assessment, and Finland was among one of only nine countries to contradict this finding. In terms of immigrant students' mathematics performance, Finland's average falls below the OECD's average, and the nation has experienced a notable decline from 2006 to 2015; "the difference in the percentage of low performers in mathematics between students with an immigrant background and those without an immigrant background is one of the highest among PISA-participating countries and economies" (OECD, 2017b, p. 5).

With regard to social background, which incorporates the social status of parents, Finland falls above the OECD's average and has remained stable since 2006 (OECD, n.d.). The PISA also provides more detailed outcomes with regards to social equity including measures for the

“impact of social background”, “performance gap”, and “resilience”. These measures encompass all three sections of the PISA, including Science, Reading, and Mathematics. According to the OECD (2016):

PISA defines equity in education as providing all students, regardless of gender, family background, or socio-economic status, with high-quality opportunities to benefit from education. Defined in this way, equity implies neither that everyone should achieve the same results, nor that every student should be exposed to identical approaches to teaching and learning. Rather, it refers to creating the conditions for minimizing any adverse impact of students’ socio-economic status or immigrant background on their performance.” (p. 202).

In 2012, when mathematics was the domain of focus, Finland was identified as a country that provides, “high levels of performance with equity in education opportunities” (OECD, 2014a). Finnish mathematics performance represented both above average scores and above average equity in education opportunities. The OECD attributed these findings partially to early detection within the Finnish educational system. In the more in-depth analyses of the 2012 PISA results for mathematics, Finland fell below the OECD average when examining the mathematics performance differences among students of varied socio-economic categories; Finland demonstrated small discrepancies in performance across socio-economic groups. When studying resource allocation, Finnish principals in more impoverished schools indicated that their schools had sufficient, and comparable, resources when compared to more advantaged school (OECD, 2014a).

Finnish Teachers and Students

Various authors (Andere, 2014, Aho et. al, 2006, & Hancock, 2011) posit World War II as a catalyst for Finland's educational renovation and the unity of political, economic, and social sectors in education. As a result of World War II, Finland maintained its independence, but in doing so, also acquired significant debt. In an effort to revitalize the country's economy, Parliament committed to education; it was the decided mechanism for economic recovery, and in 1963 the public, comprehensive school system and a national curriculum were implemented. This 1963 initiative was the stepping-stone for future educational progressions and reforms within Finland; with this point, it can also be noted that while Finland has adapted its education and policies over the past few decades, its underlying constructs and societal values, of equity and autonomy, have been maintained and provide a stabilizing force within the educational system (Aho et. al, 2006).

Paired with Finland's high-value in education comes the high-value placed on the teaching profession. Admittance for the teacher education programs yields low acceptance rates of less than 10%. (Tirri, 2014). This is due not only to the high number of applicants, but the limited number of applicants accepted into each university's teacher education program. Tirri (2014) notes that acceptance into the University of Helsinki's law and medicine programs is more likely than acceptance into the teacher education program (p. 602). The Ministry of Education funds a specific number of degrees, for which the universities are responsible. "Teaching practice is integrated into all levels of teacher education time. It is supervised by university teachers, university training school teachers or local school teachers depending on the phase of practice" (Niemi, 2011, p. 43).

Teachers in Finland work between four and five hours per day for a five-day school week. Class sizes in Finland are relatively small: generally ranging from 17 to 22 students within

a class (Andere, 2014; Seaburg, 2015). Teachers within the educational system are highly qualified, and they generally remain in the profession for many years. There is a mutual trust and respect among students and teachers, which extends beyond the classroom. In Finnish society, teachers are viewed as professionals and experts. In attempts to understand the appeal of entering the teaching profession in Finland, Andere (2014) found that both intrinsic and extrinsic factors served as motivators. Though teaching salaries are relatively low in Finland, extrinsic factors, such as, job security, vacation time, and pedagogical autonomy act as motivators. With regard to intrinsic influences, individuals identified the high quality of life associated with the Finnish teaching profession and an interest in working with children as key components.

In recent years, the board increased funding for educational opportunities for teachers, which supports the underlying Finnish cultural mantra of life-long learning. Teachers have differentiated paths depending of the schooling level, content, and type of education they will be teaching (i.e. vocational education, special education, university education, etc.) With this, mathematics teachers are required to attain a master's degree and their coursework consists of both pedagogical and mathematics dimensions (Niemi, 2011). It can also be noted that at *both* the elementary and secondary levels master's degrees are required (Tirri, 2014).

In a comparison of Finnish and Swedish school-based teacher education (SBTE), interviews with mathematics teacher educators revealed that teacher educators perceived the mathematics knowledge of Swedish teachers to be insufficient, but Finnish teachers' mathematics knowledge was not of concern (Ryve, Hemmir, and Borjesson, 2013). Teacher educators did, however, identify one potential concern in their observations of Finnish teachers: noting the tendency for teaching to be "mechanical" and an over-emphasis on the textbook. With regard to school-based teacher education, the focus group considered the Finnish system to

encompass a cohesive arrangement between the participating practice schools and universities, which facilitated the unification of theory and practice; “university practice schools are portrayed as ‘wonderfully functioning human laborator[ies] where teachers can learn about aspects of and problems in the classroom, about pupils, learning, and teaching and ‘there’s no limit’ to what you can learn” (p. 142). The authors comment that while the Finnish and Swedish educational systems possess many commonalities, their school-based teacher education programs diverge significantly.

Samuelsson & Lindblad (2015) examined and compared the cultures of teaching in both Finnish and Swedish societies. In doing so, the researchers found notable differences in teachers’ experiences. A significantly higher number of Finnish teachers regarded their profession to be highly valued in society. The researchers speculate that the extensive efforts of the Finnish teachers’ union in the late 1950’s had a substantial impact. This movement led to professional training at the university level for Finnish teachers, and it is a practice that is still in place today. Through interviews and inventories, Samuelsson & Lindblad (2015) also identified teacher autonomy as a positive cultural influence. Tirri (2014) identifies legislation from the 1970s as the start of educational reforms that began the decentralization and relinquishment of a national curriculum.

This decentralization of education in Finland continued in the 1980s and through the 1990s: serving as a catalyst for educational shifts. The redesigning of curriculum began and increasing autonomy for teachers and school communities conveyed *trust* within the Finnish educational system (Tirri, 2014; Andere, 2014). This independence not only allowed teachers to feel that they have a positive role in their own work, but it also reflects a degree of confidence in Finnish teachers, as professionals. With the decentralization of education at all levels, teacher

education programs do not possess identical curricula, and this allowance of localized curriculum transpires at the elementary and secondary levels as well.

The Political Structure of Education

Decentralization has shifted leadership and administrative roles away from the State to both municipalities and schools. In addition to managing operational, budgetary, and personnel responsibilities, principals and superintendents continue to oversee the educational productivity within their municipalities and school buildings. Legislation within the Municipal Act requires municipalities to adhere to guidelines related to the structure of their administrations. A municipal council must be established, and this council sets up, “a municipal executive board, election board, and an inspection board” (Risku, Kanervio, & Pulkkinen, 2014, p. 35). The municipal council also regulates the procedures that steer the municipality’s administration. Municipalities range in size, and they have the flexibility to independently form additional boards; therefore, the structural compositions of municipalities are often diversified (Risku et al., 2014).

Voluntary pre-school and the first nine years of Finnish comprehensive education, are provided by municipalities. Students are designated to attend a school by local authorities, yet, students do maintain the option to enroll in another school (Risku et al., 2014). The majority of municipalities also provide upper secondary education services with less than 10% of upper secondary schools being managed by private organization. In order to obtain licenses to provide this education, municipalities, foundations, and other municipal entities submit applications to the Ministry of Education and Culture. With regards to curriculum and content, the Government determines the national goals and intents of comprehensive and secondary education. The Government also determines the distribution of instructional time for each subject area. Based

upon these general guidelines, the Finnish National Board of Education provides the national curriculum, and the municipalities (or other educational service providers) refine the local curriculum (Risku et al., 2014).

The Classroom Environment

Though all Finnish classrooms have the same, broad national goals Andere (2014) consistently describes teacher's autonomy and *pedagogical freedom*. While classrooms reflect the teachers' distinct instructional practices, some common themes still arose. Finnish classrooms exuded a welcoming, functional, and respectful environment with elements of nature and varying degrees of technology. In conversation with one Finnish teacher, Andere describes how this teacher's perspective was consistent with those of many Finnish educators: "it is all about children and children's well-being and care and nurturing them to grow the way they want to grow, not the way we want them to grow" (2014, p. 190). This statement is reflective of the culture's recognition of students' individuality. Within the classroom, this viewpoint translates into an environment where teachers develop a positive rapport with students and children are encouraged to work at their own pace. When examining students' grades in mathematics, Pehkonen (1997) suggests that teachers use criteria-based assessment methods that:

take into account 'carefulness and goodness'. According to these criteria, teachers should also estimate pupils' positive attitudes towards studying, and a pupil's school achievement should be compared with her or his earlier results and not with those of other pupils (p. 61-62).

Students are motivated by their teachers, and strict discipline is not required nor promoted (Andrew et. al., 2014).

Adding to the relaxed atmosphere, researchers (Seaburg, 2015) observed students calling teachers by their first names; yet, with this informality, respect for the teacher was perceptible, and students remained focused during class. One Finnish teacher expressed the tremendous value that is still placed upon education in Finland's society today. The educator specifically identified the rebuilding of the Finnish nation following the Second World War, and described clergy, doctors, and educators as three central components to the nation's revitalization. Sahlberg (2011) reiterated that teaching is a highly esteemed profession in Finland; "teaching is consistently rated as the most admired profession, leading ratings of medical doctors, architects, and lawyers (Helsingin Sanomat, 2004)" (p. 18). While some Finnish teachers held this view, others expressed that this respect is dissipating. Researchers (Seaburg, 2015) note that the distinction between level of respect demonstrated within Finnish and Swedish classrooms was prominent in her comparisons. With more students challenging teachers' authority in Swedish classrooms, this notion carried over into teachers' accounts of the classroom environment.

For Finnish students, intrinsic motivation is a systematic characteristic that infiltrates educational policy, teaching approaches, and finally students' perception of learning and education. At all levels, an understood respect and degree of independence is observable. Beginning with policy, teachers must work within the confines of the National Curriculum Framework. However, they also possess a principal role in making the instruction their own. Finnish teachers are able to select their instructional practices, choose their own course materials, and design their own measures of performance (Aho et. al., 2006).

This approach filters down to the students who are evaluated, not with common curricular assessments, but instead with a measure of their own progress. Andere (2014) describes the "unhurried" environment that is created within Finnish classrooms, fostering a sense of security

and independence for students. This unrushed educational environment affords teachers and students opportunities for engagement in exploratory activities, which promote critical thinking and problem-solving skills in mathematics. After completion of their nine years of compulsory education, Finnish students are able to choose *their path* with enrollment in an upper-secondary school, a vocational school, or an alternative route. Finland's less explicit approach towards intrinsic motivation displays how this culture might vary from other nations; yet, Finland's path has led its students towards successful educational outcomes, particularly in mathematics.

In an analysis of the 2011 Trends in International Mathematics and Science Study (TIMSS) results, Andere (2014) describes findings that hold implications with regards to equity, teaching approaches, and educational practices within Finland's mathematics sector. Finland's scores, along with Norway, resulted in the lowest standard deviations among the countries taking this international mathematics assessment, indicating equal opportunities for high performance regardless of the school students attended. Teachers' responses also suggested that Finnish curriculum covered just over 50% of the mathematics content assessed on the TIMSS; however, Finland's ranking of 4th or 5th, among 45 countries involved, indicates that students scored high on topics that were not explicitly addressed in their mathematics curricula. A low frequency of rote exercises, as well as a low frequency of assessment, was reported within the Finnish mathematics classrooms. It was also reported that only 1% of Finnish students were administered mathematics examinations every two weeks (or more) and only 2% of Finnish students reported three or more hours of weekly mathematics homework. These results exemplify Finland's emphasis on learning as opposed to assessing and echo the nation's emphasis on learning quality and efficiency as opposed to quantity and frequency (Andere, 2014, p. 86-87).

Student and Teacher Burnout

Though these results indicate a low-stress learning environment with trust in its teachers, teacher attrition is a developing concern within the Finnish education system (Craig, 2017; Webb, Vulliamy, Hamalainen, Sarja, Kimonen, & Nevalainen, 2004). While the rates of teachers leaving the profession are relatively low, the numbers are increasing (Heikkinen, Jokinen, & Tynjälä, 2012). In a comparison of teachers' perceptions of education legislation and reform, researchers (Webb, et al., 2004) examined educational dynamics in both England and Finland. In 1994, legislation eliminated the national curriculum and the national inspection system (p. 170), and findings suggest that while some individuals viewed Finland's reform as facilitating teacher autonomy and creative instructional practices, others felt that it led to ambiguity in teachers' roles and increased workloads. With these changes, some teachers described how they inherited additional responsibilities, and their professional focus strayed from their primary responsibilities of teaching students and preparing them for their future academic endeavors. For some educators, the curriculum reform was perceived, "as devaluing and undermining their achievements and causing unhelpful fragmentation, diversity and uncertainty in individual schools and the educational system as a whole" (Webb et al., 2004, p. 174). Nearly 70% of Finnish teachers also expressed a need for salary increasing and uniformity among schools; educators also expressed discontent with the conditions of their school facilities (Webb et al., 2004).

While pay was the primary deterrent for Finnish teachers remaining in their profession, the intensification of teachers' workload was also a noted concern. Students' declining behaviors and the public's increasing critiques of teachers and the educational institute hindered English and Finnish teachers' desires to remain in their profession. In contrast, several factors also bolstered individual's desire to remain in teaching. A primary incentive for remaining in the

profession was educators' commitment to their students. Additionally, while some perceived autonomy to be a catalyst for increasing workloads, other educators viewed their professional autonomy as an appealing characteristic of their job. Positive school relationships with both students and colleagues were also identified as reasons to remain in the profession (Webb et al., 2004).

Pyhalto, Pietarinen, and Salmela-Aro (2011) note that in Finland, the teaching profession has the highest rates of burnout when compared with other white-collar and human service-related professions in the nation. The authors describe burnout as the composition of three symptoms: "exhaustion, cynicism, and professional inadequacy" (p. 1101). In this investigation, the researchers collected data from educators in nine different Finnish schools and found that social interactions were the primary stressor identified by participants. These social interactions included encounters with students, parents, professional community members, and lastly, and more minimally, the school system and administrators.

This concern of burnout is not unique to teachers but it is an issue among Finnish students as well. Researchers (Salmela-Aro, Kiuri, Pietikainen, & Jokela, 2008) note that prior studies have indicated that approximately 10% of Finnish adolescent students experience school burnout (p. 13). Referencing the Organisation for Economic Co-operation and Development (OECD) 2003 analyses, 15-year old Finnish students scored high on international mathematics, reading, and science assessments, but they placed last with regard to 15-year olds' enjoyment of school. In their investigation, the researchers divided their analyses into younger students at comprehensive schools and older students at upper secondary schools. Additionally, within each of these two levels, the researchers conducted analyses of student burnout at the individual and school level. When considering factors related to student burnout at the school level, variations

were found among students at the comprehensive and upper secondary level. For students in comprehensive schools, school climate, school support, and gender were identified factors; for those at upper secondary schools, positive motivation from teachers, family structure, and gender were related to burnout for students. At *both* school levels, the researchers found little variation between schools with regards to student burnout, and posit, “One reason for this homogeneity is that all schools have high quality teachers with a university degree. Moreover, the number of private schools is extremely small and schools are tuition-free” (Salmela-Aro et al., 2008, p. 20). The authors note that differences in burnout between schools were minimally related to school related support, and instead, related to socio-economic status and achievement measures.

At the individual level, for students in the comprehensive and upper secondary schools, the researchers identified the same five factors as related to Finnish students’ burnout: school climate, school support, positive motivation from teachers (teacher encouragement, impartiality, etc.) GPA, and gender. A negative school climate, less school support and motivation from teachers, and a lower GPA were linked to greater student burnout. Researchers also identified gender as a factor with more female students experiencing burnout than males (Salmela-Aro et al., 2008). Virtanen, Kiuru, Lerkkanen, Poikkeus, and Kuorelahti’s (2016) study of Finnish seventh, eighth, and ninth graders, aligned with prior research, which indicated a negative relationship between school burnout and students’ affective and cognitive engagement. Affective and cognitive engagement also correlated positively with academic achievement; therefore, understanding the factors contributing to Finnish students’ school burnout and their affective and cognitive engagement can subsequently support an understanding of those factors, which also impact student achievement.

Mathematics Participation and Practices in Finnish Schools

In a longitudinal study of over 3,000 Finnish students', Touhilampi (2016) examined the progression of students' mathematics achievement and affect in third, sixth, and ninth grade. The researcher found that students' math-related affect decreased over the years. Affect was considered in terms of enjoyment and self-efficacy. Students' overall math-related affect dropped from average score of 71% in third grade to 60% by sixth grade and 52% by ninth grade (p. 14). When considering the two dimensions of affect, a more notable decline was identified in students' enjoyment between third and sixth grade and the decrease in self-efficacy occurred between grades six and nine. Furthermore, girls' mean percentile was consistently below boys at each of the three measures.

In a comparison of Finland and Chile, with the countries being categorized as an *individualistic* culture and a *collectivist* culture, respectively, Touhilampi (2016) examined third graders' mathematics affect at the individual and interindividual, or social, level. The results indicated that third grade Finnish students had a positive affect at the individual level but a less positive affect at the interindividual level, unlike Chile whose results found a more positive affect at the interindividual level than at the individual level. Such a finding suggests that students mathematics affect may be reflective of the cultural characteristics in which their mathematics learning is set (p. 19).

In a comparison of Sweden and Finland through observations of multiple schools in both countries, it was noted that while the systematic structures of both Finland and Sweden are quite similar, their mathematics performances on the Programme for International Student Assessment (PISA) diverge. In terms of the format of classes in both Sweden and Finland, Seaburg (2015) describes them as "traditional", beginning class with a review of homework and ending with students working through an assignment on newly learned materials. Problem solving and high-

level thinking skills are emphasized within the Finnish mathematics classrooms. Students are given a set of formulas and tables in the upper secondary classes, and these tools can be used on all their work; this allows for the focus to be shifted away from the retrieval of facts towards application and problem solving. Finnish textbooks also underscore problem solving, and unlike Sweden's textbooks, which include answers for some problems, Finnish textbooks include answers for all mathematics problems so students can check their answers. Beyond the textbooks, which are used consistently during instruction, technology is visible within Finnish classes. Interactive whiteboards, Texas Instruments calculators, and in one class, student laptops were visible (Seaburg, 2015).

However, Rosvall, Hjelmér, and Lappalainen's (2017) examination of Finnish and Swedish vocational schools counters this notion of high mathematics expectations in Finland. Examining the mathematics classes of three vocational schools in both Finland and Sweden, the researchers found that by, "approaching pedagogic practice with a focus on care rather than knowledge makes it difficult for the students to achieve their goals or the goals of the curriculum" (p. 436). The authors suggest that the identified "discourse of care or therapy" (p. 435) may be a discourse that is specifically associated with vocational mathematics classes; however, the role of this mathematics discourse contributes to students' mathematics participation, achievement and application and must be noted.

The relaxed environment within Finnish mathematics classrooms also translates to the average number of hours Finnish educators teach and students spend in school. Within a school year, Finnish educators teach approximately 600 hours compared the 1080 hours that American educators teach. With this abridged teaching load, Finnish educators are afforded time to plan the content, measure students' learning, and offer assistance to students (Seaburg, 2015). When

looking at OECD countries that scored highest on the PISA, including Finland, higher performing countries accumulated few hours of direct instructional/teaching time. Finnish teachers taught fewer lessons and taught fewer hours but participated in more professional development and curriculum planning opportunities (Sahlberg, 2011).

At the secondary level, students' seventy-five-minute classes generally meet two to three times a week. Finnish students at the upper secondary level select a six-course mathematics progression or a ten-course progression, and each mathematics course is approximately seven to eight weeks long. The ten courses include functions, polynomial functions, geometry, analytic geometry, vectors, probability and statistics, differential calculus, root and logarithmic functions, trigonometric functions and sequences, and integral calculus (Seaburg, 2015, p. 596). Students receive numerical grades up to ten, and formative assessments are regularly used as opposed to standardized assessments.

In addition to the requirement that Finnish mathematics teachers attain a master's degree at both the lower and upper secondary levels, universities' entrance requirements for teacher education programs are also very high. Teachers in Finland frequently travel from one grade to the next with students for anywhere from two to four years. It is also common for teachers to have students for multiple content areas at both the comprehensive and lower-secondary levels. Collaboration among educators, schools, and the community is embraced and an emphasis is placed upon cooperation instead of competition. "One of Finland's highest goals is equity in their schools and between schools. Finns call it *nosto monet* ("lifting the many"). They emphasize cooperation between schools and communities instead of competition" (Seaburg, 2015, p. 595). This theme of equity is one that is consistently identified by researchers (Sahlberg,

2011; Seaburg, 2015) as characteristic of the Finnish educational system. With regards to mathematics, little mathematics tracking was identified within Finnish mathematics structures.

Multicultural Education

One area where Finland's equity is being questioned relates to immigrant students' performance; differences were clearly evident in the 2012 PISA results for each of the three assessed domains—mathematics, reading, and science. Relative to many other nations, Finland's population consists of a small percentage of immigrants, yet, the number of foreign-born citizens and second-generation immigrants is increasing and equity must be addressed. In the 1990s, with the nation's immigrant population increasing, Finland established a one-year preparatory program for immigrant students to adapt to the Finnish school system and acquire one of the two dominant educational languages of the nation, either the Finnish or Swedish. Though this program supported students' acquisition of the Finnish or Swedish language to a degree, one year is not sufficient for students to be fully submerged in lessons comprised of a newly acquired language. Finland's educational system does acknowledge the limitations created by such an educational environment, and the nation's policy supports immigrant students' first-language education. However, the system encounters challenges with finding proficient teachers to enact these educational supports for all students' first language (Sinkkonen, & Kytälä, 2014). In addition to language barriers, which impact students' acquisition of content and often influence assessment outcomes, cultural factors also contribute to the obstacles that immigrant students must overcome in Finland.

While multicultural education has been a component of Finland's system for years, uniformity is lacking and "in Finland, the basic problem throughout society, including education is that multiculturalism is still seen as concerning 'the others' (Holm and Londen 2010). In other

words, Finnish society and the school system are not very multicultural” (Sinkkonen, & Kyttälä, 2014, p. 168-169). By referencing immigrants as ‘the others’, the researchers are insinuating misalignment between the system and individuals, and this also suggests an imbalance in students’ social capital within society and within the educational system. This imbalance manifests within the classroom in various ways, and immigrant students are often disproportionately represented in special education. Within the preparatory schools, co-teaching and school assistants provide additional supports in attempts to meet the diverse needs of students, and after the first few months of attendance at preparatory schools, students transition to a general education setting for a portion of their time. While some Finnish teachers possess an optimistic perspective and shared positive experiences with immigrant students’ transition to general education, others revealed their prejudices and conveyed attitudes associated with socially dominant views. In Finnish teachers’ interviews, immigrant students were frequently referred to as ‘the others’, who “should learn from ‘us’” (Sinkkonen, & Kyttälä, 2014, p. 180), and teachers identified assimilation as that which was necessary for immigrant students. A view, such as this creates imbalances in cultural capital by referencing the Finnish citizens as “us”. It suggests that immigrant students do not belong within the perceived group, “us”, and it assumes that the Finnish culture, and the individuals within that culture, possesses superior capital; it dismisses the consideration of societal and systematic shifts, and instead places sole responsibility of misalignment upon the individual.

Bronfenbrenner (1976) posits that macro-systems are the principal entities of cultural systems, such as education, and that micro-systems are the tangible expressions of these cultures. These macro-systems serve dichotomous roles acting in both a structural sense and as a mechanism through which ideologies and content are conveyed. These macro-systems bestow

meaning and positioning upon systematic agents and influence their dynamics. Therefore, an educational system is reflective of the values of the environment in which it is set; this environment also manifests the power (Bronfenbrenner, 1976) and social and political capital embedded within the educational system to various agents within this cultural system.

Special Education

Coinciding with the notion of equity is Finland's considerable attention to addressing special educational needs. Finland has a significantly greater number of students identified as requiring special needs than other countries belonging to the OECD. As of 2016, approximately 30% of students received some degree of special education support (Lempinen & Niemi, 2018). With this, the importance of inclusion of special needs students is promoted and in earlier years, an emphasis is placed on supporting special needs students with their language and mathematics skills. Curriculum changes from 2011 underscore greater inclusion of instructional differentiation and special education within the compulsory education (Andere, 2014, p. 99). Rather than emphasizing students' attendance in their neighborhood schools, reforms called for consideration of the facilities that would best meet instructional needs either in a regular or special education setting. So, while the nation maintains students' participation in their neighborhood schools, parents also have the right to school choice.

In a 2018 study, researchers (Lempinen & Niemi, 2018) examined the role of social class, which encompasses parents' education, parents' employment, and income. The results indicated that the most important consideration for parents of all social classes was whether or not the school was neighborhood school, and no links were found between parents' social class and students' assigned school placement. These results suggest that social and cultural capital have minimal influence upon the location where their children attends school. Additionally, parents'

socioeconomic status did not vary with regards to their child's attendance in neighborhood or non-neighborhood school, again, indicating that students' school placement was marginally affected by economic capital. With regard to support types, variance was not noted among upper and lower middle classes, yet those belonging to a lower social class placed greater value on special education supports than those in higher social classes (Lempinen & Niemi, 2018). Overall, results suggest students' individual needs, rather than their economic or social class, determine students' school placement.

Researchers (Saloviita & Schaffus, 2016) exemplify this in their examination of teachers' attitudes towards inclusion of special education students. Teachers were more welcoming of inclusion if societal or political structures, which infiltrate local educational entities, encourage this. In a comparison of Finland and the German federal state, Brandenburg, results indicated that twice as many Finnish educators believed that the mainstream setting could appropriately meet the academic needs of special education students when compared to their German counterparts. Finnish teachers had more positive attitudes regarding inclusion, yet teachers from Brandenburg were more open to having students identified with attention deficit disorder, emotional problems, or behavioral problems. While both Finland and Brandenburg have a high percentage of students in special education, one distinction is that special education in Brandenburg often separate special education into entirely different schools while special education in Finland frequently remains within the local school while still in a separate classroom. This systemic characteristic may contribute to Finnish teachers' more positive attitude towards inclusion. Additionally, though not mandated by law, a commonly occurring practice in Finland is that when special education students are included in a mainstream classroom, additional adult support is often provided (Saloviita & Schaffus, 2016).

Finland's model for special education interventions currently entails three levels: general, intensified, and special support. This more nuanced progression of special education came about in 2007 through the Special Education Strategy (SPES). It was a response to the increasing enrollment in full-time special education and inconsistent criteria for inclusion/special education (Ekstam, Linnanmäki, & Aunio, 2015); the intent was to create greater, more unified criteria for inclusion and special education supports among municipalities in order to diminish inequities and to encourage early interventions within the general education classrooms. Researchers (Saloviita & Schaffus, 2016; Ekstam et al., 2015) also point out the nation's economic motivations underlying the special education transitions towards a more inclusive model. These economic intents were not unique to Finland but instead were trends that were seen throughout Europe given the economic climate.

In 2009, Finland shifted the fiscal responsibilities of special education from the state to municipalities, which halted the escalating number of students who were transferred to a special education setting. Inclusive practices were more economically appealing, and this heightened interest in minimizing special education students' segregation (Saloviita & Schaffus, 2016). Prior to Finland's educational reforms, the most common reason for special education support for students in lower secondary schools (students from grades seven to nine) was low achievement in mathematics (Ekstam et al., 2015).

In an investigation of Finnish educational support practices for lower performing mathematics students in lower secondary schools, special education teachers indicated that they spent almost half of their time (41%) within mathematics. The two predominant instructional models used by special education and mathematics teachers were co-teaching or a pull-out model. While educators indicated that co-teaching was an effective mode of instruction where

differentiation and supplemental resources were used, 64% of mathematics teachers preferred the pull-out model. Among special education teachers, approximately 37% favored small group instruction and approximately 26% of special education teachers indicated that a combination of co-teaching and pull-out was most effective (Ekstam et al., 2015). In order to differentiate mathematics educational practices, Finnish teachers frequently implement flexible assessment models, calculator use, and part-time special education support (Ekstam et al., 2015, p. 82). Overall, both Finnish mathematics and special education teachers expressed approval of the effectiveness of educational supports related to mathematics. Lastly, 59% of special education teachers and 43% of mathematics teachers indicated that their responsibilities had changed with the implementations of educational reforms, reiterating the notion that policy trickles down to influence practice (Ekstam et al., 2015).

The Extensions of Policy

Extending beyond school years, Finnish progressive policies related to public childcare were established in the 1970s. Early childhood education and care (ECEC) began in Finland in the 1990s: “capacitating both gender equality and children’s human capital and wellbeing” (Lundkvist, Nyby, Autto, & Nygard, 2017). From birth to age six, parents have access to full-day childcare with the option for children to attend pre-school at age six before beginning their compulsory education at seven (Andere, 2014; Lundkvist et al., 2017). Full-day childcare was made accessible to all, and additional public supports for families are available; maternity leave can extend up to three years with the option for fathers share maternity leave. Most recently in 2015, pre-school, which was previously voluntary, shifted to compulsory education and updates were also made to childcare laws. Within the same year, stipulations were added to the accessibility of full-day ECEC; instead of continuing to offer full-day care to all families, only

twenty hours of care are available to families where both parents are not working full-time, going to school full-time, or accessing family leave. Acknowledging the international financial crisis as the catalyst for more stringency on public supports, researchers (Lundkvist et al., 2017) question the intentions behind these more recent reforms and highlight how policy often serves as the intermediary between broader economic and political structures and more localized social and educational entities. The researchers' inquiry demonstrates how policy reforms, such as these, jeopardize children's well-being, their learning, and their social capital, and the path towards these reforms and the intentions behind them must be more fully understood.

While policy reforms have been infiltrating education systems globally, Finland has resisted many prevalent educational trends, and instead, preserved the underlying values of its society. Sahlberg (2007) identifies three widespread characteristics of education reform policies that have been seeping into educational institutions throughout the world. The *standardization of education, an increased focus on literacy and numeracy, and consequential accountability systems* (p. 150-151) have created a new culture of education in many nations; yet, Finland's system continues to counteract these. While domineering curriculum standards have been established at a national level for many countries, Finland implements a localized curriculum, and compared to many other countries, a unique degree of instructional autonomy is allocated to Finnish teachers and schools. Although reading, writing, and mathematics comprise core aspects of Finnish education, an equal focus on individual's growth in all domains is identifiable within the Finnish curriculum. School and teacher accountability through standardized assessments has been pervasive in the modern educational culture. Used as an evaluative tool to determine students' achievement, teachers' effectiveness, and schools' success, this is another common trend that has not permeated Finland. With only one standardized assessment, the Matriculation

Examination, students in Finland are rarely exposed to standardized measures. “Finnish education policies today are a result of four decades of systematic, mostly intentional development that has created a culture of diversity, trust, and respect within Finnish society in general and within its education system in particular” (Sahlberg, 2007, p. 152).

In a study that examined fifteen European Union countries and their mathematics performance on the 2003 PISA, researchers (Martins & Veiga, 2010) found that Finland had the second lowest socioeconomic-related inequity. More broadly, these researchers also found that those countries that demonstrated lower inequities obtained higher mathematics achievement levels, and countries with greater inequities performed lower. With policy reforms that have the potential to hinder Finland’s equitable landscape, it is important to understand the affects that legislation can have upon students’ social capital and their mathematics learning.

Equity is a critical aspect of mathematics achievement. While many studies have centered around observation and interview within the Finnish educational and mathematics setting, few have focused solely on the *text*. This inquiry hones in on the text, which is an instrumental intermediary between the political and social facets that interact with the implementation of educational and mathematics practices within the classroom setting.

This review of literature has demonstrated the importance of mathematics, but it has also highlighted the international concerns related to students’ declining participation in the discipline and the presence of inequities related to mathematics accessibility and achievement. Finland distinguishes itself from other nations with its counterintuitive approach, which includes a laidback learning environment, little homework, few assessments, and fewer instructional hours (compared to other high performing nations). It continues to place emphasis upon equity with little inequity present between its schools and among students of varying socio-economic

statuses. Finland's high performance on the mathematics PISA, and its decentralized educational system that provides autonomy to its highly respected teachers is admirable and perplexing (Andere, 2014; Andrews et al., 2014; OECD, 2014a; Sahlberg, 2011; Seaburg, 2015; Tirri, 2014).

Yet, while it has maintained high performance, Finland's rankings have declined in more recent PISA administrations, and student and teacher burnout has been an increasing concern. Finnish students demonstrate a decreasing mathematics-affect over the course of their educational careers, and inequities in immigrant students' mathematics performance have also been noted. Though small, inequities also remain consistent among genders, and differences were noted among genders with regards to mathematics anxiety and participation. (OECD, 2017b; Heikkinen, Jokinen, & Tynjälä, 2012; Touhilampi, 2016; Webb, et al., 2004; Pyhalto, Pietarinen, & Salmela-Aro, 2011). Lapplalainen and Lahelma's (2016) longitudinal analysis of curricular and policy texts reiterates the presence of inequity and suggest that a facade of equity exists; "in the 1980s and 1990s gender equality is placed in rather central positions in the curricula, but without concrete contents. Today it has again vanished from recent documents" (p. 665). In conducting their analysis, the researchers not only suggest the persistence in gender inequity in Finland, but they also accentuate the profound role of silence in ongoing imbalances. Identifying imbalances beyond gender, the researchers also demonstrate how unstated text reveals inequities through its absence. For example, when examining curriculum from the 1980s, the researchers state that, "While gender equality is included, equality between people of different social backgrounds and ethnicity or with disabilities is not present" (p. 659). In noting this exclusion of discussion surrounding equality of individuals of varying social backgrounds, ethnicities, and individuals with disabilities, the researchers exemplify the role that *silence*

(through text) can have upon the reproduction of inequities. Ikävalko and Kantola (2017) examined resistance to feminism in gender equality planning in Finland. Through interviews with actors participating in the gender equality planning of both a Finnish upper secondary and vocational school, the researchers noted that, “when looking at our findings about resistance to feminism we found mostly silence; silence as refusal to engage with concrete attempts to change unequal practices” (p. 246). Ikävalko and Kantola (2017) explain that despite attempts to diminish power relations, a disconnect remains between feminists’ intents and daily functioning of a school. This separation and this silence contribute to sustained power imbalances within a society, and more specifically within a school system.

Zilliacus, Holm, and Sahlström (2017) investigated Finland’s progression towards the institutionalization of multicultural education; examining the evolution of textual discourse related to multicultural education the researchers analyzed curriculum documents and amendments spanning across twenty years—from 1994 to 2014. In their research, the authors found that, “the Finnish education system is introducing a curriculum with strikingly different discourses on multicultural education. Within these discourses, cultural diversity emerges as an intrinsic part of the school” (p. 244). The researchers note that the most recent curricula signify a shift “from a tolerance-oriented and a nation-bound curriculum towards a pluralist-and globally oriented curriculum” (p. 244). Yet, with these positive transformations in the curriculum, the researchers also identified areas where silence still resonates; with regards to this silence the researchers appeal for more direct discourse— “more explicit aims to eliminate social and educational inequalities and deconstruct whiteness would therefore create an even stronger allegiance to equity and justice” (p. 244).

Therefore, with a nation as successful as Finland in its mathematics performance and

educational equity, it is apparent that inequities remain and must be addressed. Finland is a nation that has resisted many educational initiatives and policy trends that have been adopted internationally, yet, with its unique approach and distinguished outcomes, it encounters some of the same issues as other nations. Consequently, insight into the contributing factors that manifest educational and mathematics inequities through analysis of policy and curriculum texts can provide a greater understanding of these issues.

CHAPTER 3: METHODS

Introduction and Context

Chapter three will address the methodological components of this inquiry beginning with a description of the socio-cultural theory and the application of Bourdieu's concepts of *habitus*, *field*, and *doxa*. An introduction of the research questions will precede a description of the texts to be used in this investigation. Fairclough's perspective on critical discourse analysis will be applied in this policy analysis; his dialectical-relational approach and its corresponding stages will be explained in order to clarify the methodological process of this inquiry.

This investigation focuses upon the nation of Finland. Described by its Ministry of Foreign Affairs ("This is Finland", n.d.) as a parliamentary democracy, Finland is a free-market economy with a young but progressive history. While the nation's scores on the 2015 triennial PISA continue to indicate above average performance on all three domains, science, reading, and mathematics, inconsistencies were disclosed with regard to equity. Scoring above average on equitable achievement related to social background, which includes factors such as parents' education and employment, Finland fell short regarding equitable achievement as it pertains to gender and immigrant students ("Compare Your Country, n.d.). This investigation will survey Finnish policy-related texts, education and mathematics curriculum, and Finnish artifacts; through the analysis of these texts, the intent is to determine how inequities and power dynamics are decipherable within these documents and potentially jeopardized students' accessibility to mathematics endeavors. Fairclough's interpretations and applications of critical discourse analysis will provide the foundation for analyses of Bourdieu's notions of field, doxa, and habitus as they relate to Finnish equity and mathematics education and performance.

Rationale for Approach: Socio-Cultural Theory

From a socio-cultural lens, Pais (2013) suggests that the meaning of mathematics is entrenched in the surroundings in which it is situated. Kinard and Kozulin (2008) echo the intertwined nature of culture and mathematics. Referencing Vygotsky's (1979) concept of psychological tools, Kinard and Kozulin (2008) explain how symbolic structures and mathematical representations are developed and evolve over time based upon cultural needs. Individuals learn through general, everyday activities, such as play, work, and interactions with others, however, Kinard and Kozulin note that in each of these activities *learning* is not the goal, but instead a byproduct of daily cultural endeavors.

Permeth and Dalzell's (2013) work reiterates the ever-present role of culture in mathematics *and* demonstrates the bidirectional interaction of mathematics and culture. Describing mathematics curriculum standards as an amalgam of political and economic matters, a country's political and economic performance is also contingent upon the mathematics competencies of those that comprise such entities.

Andrews (2016) notes, "cultures are social, historical, and behavioural constructions" (p. 10). Acknowledging that culturally isolated curricula are rare in today's world, he attempts to illustrate how mathematics curricula and instructional practices within the classroom converge to the cultural norms of their surroundings. Andrews examines the national curriculum statements of four countries, English, Finland, Flanders, and Hungary with regards to linear equations, examining the degree of specificity of each curriculum's progression. He identifies the presence (or absence) of particular methods and approaches, and the presence (or absence) of yearly benchmarks.

With regard to Finland, Andrews (2016) points out that the looser curriculum expectations are indicative of the low power distance and low uncertainty avoidance present in

this culture. The low power distance references the low degree to which Finnish curriculum was imposed upon teachers and low uncertainty avoidance indicates that Finnish educators had little discomfort when presented with situations that were perceived to be unstructured (Andrews, 2016; Hofstede, 1986). Finland's educational system embraces high levels of autonomy for educators and local schools. Andrews notes that, "curriculum authorities see no need to over-specify, say, teaching approaches because teachers are trusted to manage their responsibilities appropriately" (2016, p. 14). This exemplifies one instance in which culture infiltrates education, language, and mathematics curricula. Using these dimensions of culture, Andrews explains how the nuances within the curricula statements reflect the cultural dimensions of the society. This aligns with Fairclough's (1989) work on critical discourse analysis (CDA) where he describes "language as discourse and social practice" (p. 21). In order to more fully understand the cultural dimensions of the Finnish society that impact their equitable educational and mathematics practices and outcomes, an examination of the nation's political, cultural, and educational texts would be beneficial.

An awareness of the evolution of language, written or spoken, can provide both historical and cultural contexts for the text or speech that is being generated. "No human social formations can historically be imagined without implicating language and its users" (Capone & Mey, 2016, p. 2). Language is an inevitable link that enables communication and interactions to occur. Capone and Mey (2016) explain that in order for social practices to occur, individuals must communicate, and language is the intermediary through which this communication can occur. Bourdieu's (1977) perspective is that the essence of an interaction is not solely encompassed within that interaction itself. Instead, "the principle governing societal interaction is the human habitus, conceived of as the 'internalization of [society's] structures as disposition'" (as cited in

Capone & Mey, 2016, p. 3). An individual's constructed outlook is manifested through the cultural constructs in which he or she exists. When language is exchanged, there are two facets to consider: the delivery of the message (or content) and the receipt of that content. Lui & Guo (2016) state that, "listeners or readers who have different positions and ideologies may act differently towards the same discourse. As a result, power and ideology are argued to [be] taken into consideration in [critical discourse analysis] CDA." (p. 1079). When examining educational policy and mathematics curricula, examination of the language and expected practices must be analyzed within the context in which they are established and to be implemented.

Habitus

Bourdieu's *habitus* captures the significance of recognizing and understanding the embedded cultural components that influence policy and practice and attempts to demonstrate how both public and private educational entities are implicated in the cultural reproduction of inequities. "Habitus operates at various levels—in one's thoughts, actions, use of language, and in how one embodies experiences of structures and relations" (Nolan, 2012, p. 204).

Mathematics practices are influenced by structural complexities and social dynamics. The researcher considers the application of Bourdieu's social field theory from the educator's perspective, examining pedagogical discourse and instructional practices that are assumed within a culture and its educational setting (Nolan, 2012).

Nolan (2012) uses educators' inherited perceptions of testing as an example of how historical and cultural influences are embedded within mathematics practices. The researcher notes that with regards to students' implicit mathematics-related identities, "The image of what it means to do mathematics – entangled with a set of inflexible rules and procedures – limits the kinds of identities students can develop as successful mathematicians" (Nolan, 2012, p. 209).

The construed meaning of mathematics is bounded by the cultural and social practices within which it is set. Mathematics testing influences the mathematics identity that students adopt. It fosters the impression that the study of mathematics involves a timed task that is compared in order to devise a polarized grouping: those who *can* do mathematics and those who *cannot* do mathematics. The mathematical inflexibility manifested through mathematics testing creates a barrier by narrowing the scope of mathematics to the procedures and content of the exam. This example highlights the importance of examining the cultural components that underlie educational and mathematics practices and potentially contribute to equity and the establishment of power. As previously described, language is a prior medium through which learning occurs; therefore, an analysis of policy-related texts, as well as, education and mathematics curriculum will facilitate the identification of influences that contribute to or hinder equity.

Consistent exposure to cultural practices may infiltrate individuals' *habitus* and establish a limited perspective of the accessibility and applicability of mathematics. Recognizing the presence and role of *habitus* within curriculum and within a mathematics setting is important. How well a student's *habitus* aligns with the educational and mathematics *field(s)* within which it is set can impact their possession and degree of cultural capital as it relates to their mathematics engagement and achievement.

Field

Bourdieu considers a *field* to be historically established spaces in which social activity and positioning occur. For example, students within a classroom setting adopt the previously established practices of this educational field when they begin their schooling and learn the routines, procedures, and dynamics of this context (Thomson, 2005). A field operates within the bounded norms and practices of the space that the field encompasses, and it acquiesces to the

power relationships it manifests. Within the context of education, “privileged” students, or students with greater cultural and social capital, are those whose demeanor and language more fully align with the educational institution, classroom, and discipline that they are learning (Thomson, 2005; Nolan, 2012). Uneven access to cultural and social capital in a social field results in tension that breeds competition and struggle among the individuals, and fields reinforce the power dynamics that are engrain within them. The field is connected to the habitus from which it was manifested. Habitus both shapes and is shaped by field. That is, habitus and field are mutually constituted (Inghilleri, 2005). This iterative and intertwined nature of field and habitus is an expression of the *doxa* that are present within a particular culture or setting.

Doxa

Each of these Bourdieuan components, habitus and field, demonstrate and reinforce a presupposed *doxa*. “Doxa is the set of core values and discourses of a social practice field that have come to be viewed as natural, normal, and inherently necessary” (Nolan, 2012, p. 205). Doxa are generally unquestioned, as an awareness of their presence are not always known; they are assumed *to be*. They are historically and socially generated perceptions that are naturalized yet imposed; though often imperceptible, they are a construction that underscores inequities and power dynamics (Nolan, 2012). They are present within fields and habitus, and therefore infiltrate language and policy.

Language and policy can reinforce doxa and project the presumed doxa of a field; therefore, in order to extend its equitable intents and broaden students’ equitable participation, Finland’s doxa must first be understood through the examination of Finnish curriculum, artifacts, and policy texts. Policy “might also be theorized as a sub-field of the political field or as some kind of permanent bridge between the political and other dominated fields” (Thomson, 2005, p.

754). Policy has the potential to introduce or bolster cultural capital, produce and replicate power dynamics and positioning, and shift the field within which the policy is to be implemented (Thomson, 2005).

Research Questions

Research Question 1: What references to equity and power are visible in Finnish education and mathematics policy and curriculum texts?

(a) What possible doxa are perceptible that may facilitate or hinder equitable mathematics access and mathematics achievement?

Research Question 2: What habitus is being promoted for teachers and students?

(a) How are procedures and practices linked to different kinds of habitus?

(b) What features of mathematics curriculum (assessment, specified curriculum resources, teachers' role, and/or students' international, mathematics performance) are linked to different kinds of habitus?

These research questions are intentionally sequenced in this order and reflect the consideration of the interdependence that exists between Bourdieu's notions of field, doxa, and habitus.

Data Collection and Sources

For this inquiry, *texts* will serve as the consistent data form. In order to maintain alignment with the critical discourse methodology, *texts* are to be considered in a broadly encompassing sense; texts will incorporate but also extend beyond written texts to include various modes, such as visual images and spoken language, such as speeches (Fairclough, 2013). Four Finnish agencies, including the Finnish National Agency for Education, the Finnish Ministry of Justice, the Ministry of Education and Culture, and the Ministry of Foreign Affairs of Finland, will serve as the primary sources from which data will be collected. The two

governmental entities that have a core involvement in Finnish educational policy and curriculum are the Ministry of Education and Culture and the Finnish National Agency for Education. The role of the Ministry of Education and Culture involves the development and implementation of policies. From this Ministry, educational brochures, comprehensive curriculum action plan descriptions, multilingualism recommendation documents, reform plans for the Matriculation Exam, and a press release of the proposed upper secondary education reform will be analyzed.

The Finnish National Agency for Education's portal includes links to Finnish policy documents through *Finlex*, a website owned by the Finnish Ministry of Justice. *Finlex* provides information on Finnish legislation, and the following education acts and decrees, which were available and translated to English, will be analyzed: The Basic Education Act, Finnish National Board of Education Act, Finnish National Board of Education Decree, Government Decree on the Finnish Education Evaluation, and the Act on the Finnish Education Evaluation Centre. Additionally, a publication that diagrams the process for drafting laws will be reviewed. A major responsibility of the Finnish National Education Agency is the creation of the National Core Curriculum.

National Curriculum

The *National Core Curriculum for Basic Education 2014* and the *National Core Curriculum for General Upper Secondary Schools 2015* will be used in this analysis. These documents are published by the Finnish National Board of Education, which is an entity under the Ministry of Education and Culture. Within the *National Core Curriculum for Basic Education 2014*, there are fifteen sections, which are categorized further with two additional tiers of specificity. For this analysis, all strands in sections one to twelve, will be included in the analysis: (1) *The significance of local curricula and the local curriculum process*, (2) *Basic*

education as the foundation of general knowledge and ability (3) *Mission and general goals of basic education*, (4) *Operating culture of comprehensive basic education*, (5) *Organisation of school work aiming to promote learning and well-being*, (6) *Assessment*, (7) *Support in learning and school attendance*, (8) *Pupil welfare*, (9) *Special questions of language and culture*, (10) *Bilingual education*, (11) *Basic education based on a particular philosophical or pedagogical system*, and (12) *Optional studies in basic education*. For the remaining three sections, (13) *Grades 1-2*, (14) *Grades 3-6*, and (15) *Grades 7-9*, the first three subcategories for each section will be included; for the fourth subcategory, which relates to the disciplines for each grade range, only the mathematics strands will be analyzed.

Similarly, the *National Core Curriculum for General Upper Secondary Schools 2015*, is divided into six sections with two additional tiers of specificity. With the exception of section five, all strands in the sections will be included in the analysis: (1) *Curriculum*, (2) *The mission and underlying values of general upper secondary education* (3) *Implementation of education*, (4) *Guidance and support for students*, and (6) *Assessment of student learning*. For section five, *Learning objectives and core contents of education*, only the first two subcategories, which are not discipline-specific, and the sixth category, *Mathematics*, will be included in the analysis. The excluded subcategories describe specific curriculum content areas that are not a focus in this inquiry; since the broader field of education and the specific content area of mathematics are the emphases of this study, the selection of curriculum sections and subcategories include those that pertain specifically to education as a whole and those that hone in upon mathematics.

For both the Basic Education and General Upper Secondary Core Curriculum, the prefaces and portions of the appendices will also be analyzed.

Government Documents and Finnish Artifacts

In order to deliver a comprehensive analysis that captures the historical, political and social essences that interact with Finnish educational infrastructure, artifacts will also be collected from Finnish networks that are intertwined with and also extend beyond the Ministry of Education and Culture and the Finnish National Agency for Education. Policy documents, action plans, speeches, and press releases from the Finnish government will be reviewed, and the Ministry of Foreign Affairs of Finland will provide data related to the nation's human rights policy and an evaluative report from the United Nation's Human Rights Council. Inclusion of these documents and artifacts will supplement data related to equity and power, and it will provide multi-modal texts and presentations for the analysis of Finnish discourse.

On the websites of each of the Finnish entities described above (The Finnish National Agency for Education, Finnish Ministry of Justice, the Ministry of Education and Culture, the Finnish Government, and the Ministry of Foreign Affairs of Finland) publications, presentations, and brochures, as well as, website descriptions and excerpts will be examined. This analysis will include analysis of the layout, imaging, navigation, and texts accessible to the public. The website *This is Finland* will provide alternative artifacts in the form of editorial articles, news articles, images, citizens' perspective and quotes, and statistics. The website notes that it is produced by the Ministry for Foreign Affairs, and themes appearing on the homepage, which related to this inquiry, include terms, such as, *Finnishness, Society, Education, and Lifestyle*.

OECD and PISA Resources

Descriptions and interpretations from the Organisation of Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA) will also be used to compare Finnish intents with performance outputs. Results, explanations, and overviews from two of the most recent PISA administrations will be included—the 2012 and 2015 PISA.

Though the 2018 administration has occurred (from April 24, 2018 through May 31, 2018) the results and analyses are not yet available from the OECD. The 2012 and 2015 OECD documents provide statistics, rankings, and comparisons related to mathematics achievement and equity in Finland. Policy implications are also incorporated into the discussions within some of these documents. The following texts, including chapters, mappings, and publications will be included: *PISA 2012 Results in Focus, PISA 2012 Results: What Students Know and Can Do, PISA 2015 Results in Focus, PISA 2015 Assessment and Analytical Framework, Education GPS-Finland 2016, What is PISA?, School governance, assessment, and accountability, Mathematics Performance among 15-year-olds, What PISA 2015 results imply for policy, and PISA 2015 Results: Policies and Practices for Successful Schools.*

Data will be prioritized in order to allow for in depth coding of those documents that most directly pertain to this inquiry and the identified research questions. *Figure 1* illustrates the established hierarchy of the data sources and texts described above. Level 1 texts indicate those documents that will involve the most in depth analyses and Level 3 texts involve those that will serve a more peripheral role.

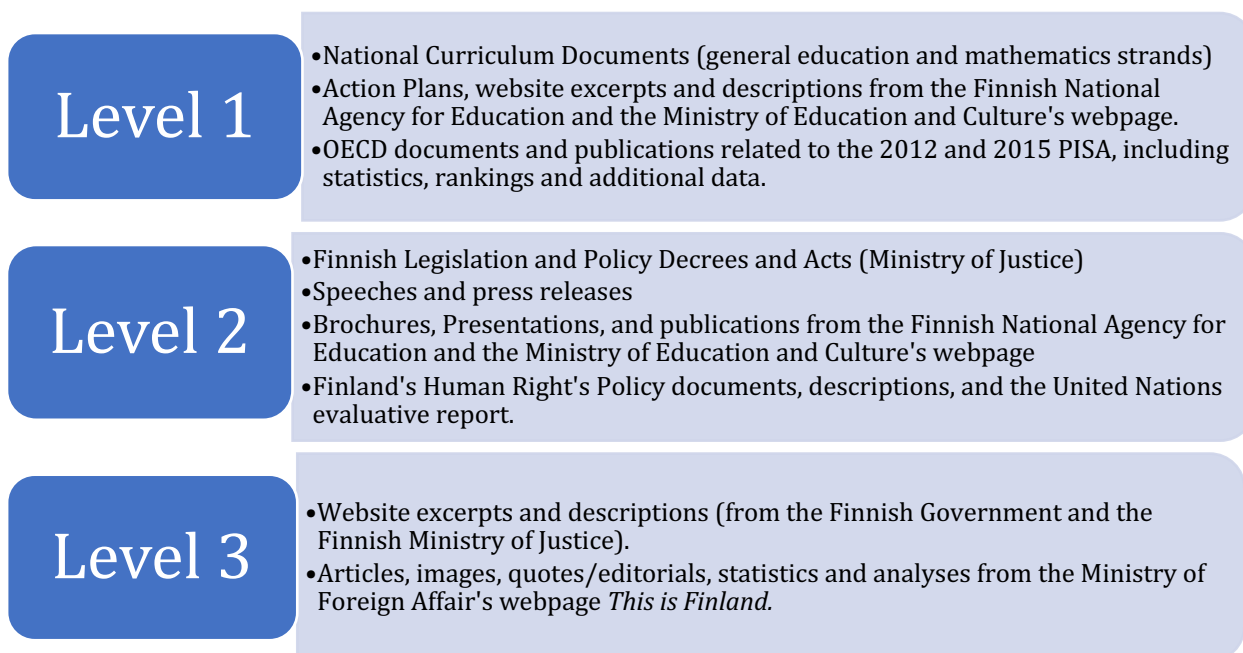


Figure 1. Hierarchy of Text/Policy Analyses

In conjunction with Bourdieu's notions of habitus, field, and doxa, critical discourse analysis will be used to determine the presence of power dynamics and understand how they are identifiable within the Finnish texts, particularly curriculum documents and related governmental artifacts; the intent of this analysis is to determine how power may be projected in educational and political texts and how power transpires within the context of education and mathematics curriculum as well as within other educational policy and achievement-related texts.

Data Analysis Methods: Critical Discourse Analysis

Language as a Social Process

Fairclough (2001) states that, "The whole is society, and language is one strand of the social" (p. 19). The researcher describes that language is not only indicative of social processes practices, but language, itself, is a part of social practices within a culture (p. 19). Fairclough (2001) explains that as a social practice, language requires examination beyond the text, and beyond its construction and interpretation; one also must delve into the interactions among

“texts, processes, and their social conditions, both the immediate conditions of the situational context and the more remote conditions of institutional and social structures” (p. 21). According to Fairclough the terms *practice* and *discourse* possess an obscurity that is somewhat intentional; “the individual is able to act only in so far as there are social conventions to act within” (p. 23). These notions align with Bourdieu’s *field* and *habitus*, which involve certain parameters and understood schemes for social functioning. Fairclough suggests that *practice* and *discourse* are influenced by the established social structure. Therefore, one’s practice and one’s discourse are fluid and dependent upon the setting in which they occur; “how discourses are structured in a given order of discourse, and how structurings change over time, are determined by changing relationships of power at the level of the social institution or of the society” (p. 25).

Understanding the larger contexts that influence mathematics classrooms and understanding the nuances of educational and mathematical discourse that influence mathematics content and approaches can assist with diminishing the subtle barriers that may be embedded within a culture’s mathematics practices.

Van Leeuwen’s (2005) chapter reiterates Fairclough’s message that discourse analysis compels a broadened scope, beyond the text and beyond the discourse. He explains that discourse analysis assists with understanding how and why certain speech or texts are used, but discourse analysis does not allow for an understanding of how and why particular speech or text came about. A cultural-historical perspective must be attained in order to understand this facet of the text or speech and this exemplifies a shortfall of the sole use of discourse analysis.

Additionally, van Leeuwen (2005) notes the benefits of an ethnographic pairing when using discourse analysis; texts “form part of social practices—but only part. They realize all or some of the *actions* that constitute the social practices—but they tell us nothing about the agents and

patients of the actions” (p. 13). The author is emphasizing the importance of knowing, not just the product, but also the processes that occurred throughout the development of this product.

Power and Ideology

Another researcher who employs critical discourse analysis is Ruth Wodak. She applies critical discourse analysis in her examination of language, yet, her emphasis and her approach examines the power dynamics and ideologies existing within the discourse. Her *critical* analysis adheres with the historical nature of her investigations of discourse. In Wodak and Meyer’s (2001) work, the authors reference Horkheimer and state, “the tasks of critical theory were to assist in ‘remembering’ a past that was in danger of being forgotten” (p. 9). Along with recognizing the importance of history, the authors suggest that critical discourse analysis is a tool for critical theory: “critical theory intends to create awareness in agents of how they are deceived about their own needs and interests...One of the aims of CDA is to ‘demystify’ discourses by deciphering ideologies” (p.10). Therefore, from Wodak’s perspective, historical and cultural ideologies may be perceptible in the written language related to Finnish mathematics.

Deciphering these ideologies can provide insights into the embedded dogmas of this society that infiltrate the education and mathematics curriculum and potentially promote or inhibit equitable mathematics practices. Though not explicit, the socially and politically accepted practices of a culture influence the mathematics curricula and educational practices.

A Dialectical-Relational Approach

A dialectical-relational approach of analysis considers discourse as meaning-making to be situated within and part of social processes; this meaning-making, or semiosis, is one component of the social process that is dialectically connected to other components of the social process. Fairclough (2013) intentionally uses the term *dialectical* in order to denote the presence

of differences among the components of the social process. In using this descriptor, the researcher is also specifying that these components are not entirely distinct. “We might say that each ‘internalises’ the others without being reducible to them (Harvey, 1996)—e.g., social relations, power, institutions, beliefs, and cultural values are in part semiotic” (Fairclough, 2013, p. 231). Using a dialectical-relational approach to critical discourse analysis, the examination will extend beyond the sole consideration of semiotic elements to also include an examination of the relations among the semiotic elements and other social elements.

Analysis of Semiotic Elements

For the analyses of the semiotic elements, Fairclough’s (2013) three categories will be applied: *genre*, *discourse*, and *style*. *Genres* indicate the ways of acting, communicating, and interacting within and during particular activities and within a particular discourse. This analysis category of genre relates to Bourdieu’s notion of *field*, as both genres and field allude to a social space within which an understood set of rules guides particular activities. It also suggests the conception of *habitus*, which influences and is influenced by a field and can also be revealed through *discourses*. Discourses are the ways that physical, social, and cognitive facets of the world are embodied; discourses are expressions and manifestations of the context within which they are set. Differences in discourse frequently exist among different social practices, and differences in discourse are found within a given practice, often uncovering diverging perspectives and demarcating positioning. In these instances, examination of discourse may also shed light upon the presence of power dynamics and cultural capital. Gee (1999) distinguishes **d**iscourses (with a lowercase d) as the ways that individuals verbally communicate and interact, from **D**iscourses (with an uppercase D), which broadens the lens to include **d**iscourse, as well as, beliefs, values, and socially and historically integrated identities (Gee, 1999). The researcher

notes, “a social action is constituted as a social practice with value and meaning only in and through the Discourse of which it is a part” (Gee, p. 2008, 182). Changes in discourses are indicative of a transferal from one scope of values to another. Lastly, *style* refers to “ways of being” (Fairclough, 2013, p. 232) and the construction of identities. The inherent, or innate, tendency of style aligns the examination of doxa (i.e., norms) (Cobb & Hodge, 2009); doxa envelops the assumed values that manifest through the construction of identities *ways of being*.

Analysis of Relations

Fairclough (2013) identifies three primary ways that semiotic elements and other social elements relate to one another: “as facets of action; in the construal (representation) of aspects of the world; and in the constitution of identities” (p. 232). Each of these three ways of relating semiotic and other social elements parallels the three categories of analysis of the semiotic elements—genre, discourse, and style. Examination of social practices and *orders of discourse* will foster an understanding of the dialectical relations among semiotic and other social elements.

Orders of discourse are the semiotic features of social practices that comprise social structures and social fields. Educational institutions are social structures that have orders of discourse (Fairclough, 2013; Fairclough, 2001). Within a school building or classroom, discourse occurs within the confines of the social field within which it is set. Social roles, positioning, actions, and demeanors are palpable through the discourse that transpires within this social structure and within this social field. For example, the discourse within an elementary school classroom will vary from that of a high school classroom and from that of a faculty meeting as each of these three contexts are comprised of very distinct social fields. The ways of communicating (genres), the ways of representing the content from a particular perspective

(discourse), and individuals' demeanors and identities (style) will vary as each embodies a unique social field of education. Investigating the dialectical-relations between semiotic and other social elements can provide greater insights into social structures; Fairclough (2001) notes the reciprocal relationship between discourse and social structure. While discourse is often the conception of structure, it is also the producer and reinforcer of structure.

Structure and Strategy

Evaluation of these social structures is one primary focus of critical discourse analysis; another primary focus is the analysis of the strategies employed by social participants within established social structures and social practices. The semiotic ways in which social players interact in order to attain particular outcomes is examined through critical discourse analysis. This aspect of the analysis aligns particularly well with the identification of cultural capital as it considers the discourse practices that are most conducive within a particular social structure; individuals and agents equipped with the strategies accepted or expected within the established social structures and social practices can achieve their intended outcomes because their habitus aligns with the social field. Analysis of these strategies extends beyond those practices employed within the existing social structures and social practices to also include the analysis of *shifts* within orders of discourse. When such shifts occur, this movement or alteration is indicative of a social change--“CDA, with its emphasis on the discursive construction of power relations and its commitment to progressive social change, is a particularly useful tool” (Taylor, 2004, p. 445). Critical discourse analysis extends the analysis and interpretation of texts to incorporate review of the larger social and structural contributors; this methodology enables a greater understanding of the connections (or disconnects) between policy texts, curriculum, and an educational and mathematics culture.

Stages of Methodology

Fairclough (2013) identifies four essential stages of methodology for a dialectical-relational approach to critical discourse analysis. These four stages will be applied to the analyses of Finnish texts noted above. Clarifying that the use of the word “stages” does not imply a necessary sequence; each stage merely indicates a necessary component of this methodology. The following are Fairclough’s (2013) four stages, which will be applied with this inquiry:

Stage 1: Focus upon a social wrong, in its semiotic aspect.

Stage 2: Identify obstacles to addressing the social wrong

Stage 3: Consider whether the social order ‘needs’ the social wrong.

Stage 4: Identify possible ways past the obstacles (p. 235).

Stage one entails the selection of a topic, which for this investigation involves the recognition of the inequities in Finnish education and mathematics achievement, though relatively minimal. The identification of *social wrongs* will be paired with the collection of artifacts, which involve research of theory surrounding the identified topic or *wrong*. Again, though minimal, differences are present among Finnish students’ mathematics performance on the PISA as it relates to gender and immigrant students. Stage two examines how the enacted social structures and social practices hinder a resolution of this *social wrong* and potentially reinforce this *social wrong*. As Finland is a nation that is renowned for its equitable intents, this stage is anticipated to also disclose those structures and practices that foster resolution and minimize inequities in students’ educational and mathematics achievement. Stage two involves three components: the analysis of dialectical relations between semiotic elements and other social elements, the selection of texts with particular focuses for their analysis (based upon the

prior collection of research artifacts), and the application of interdiscursive and semiotic analyses to the gathered text/artifacts.

“Stage three leads us to consider whether the social wrong in focus is inherent to the social order, whether it can be addressed within it, or only by changing it” (Fairclough, 2013, 238). Stage three involves the consideration of *doxa* and whether the established social order is reliant upon this *doxa* in order to sustain its present state. This stage provides insight into the ideology of the social order within which the text is set, and stage three aligns with the intents of this inquiry, which are to dissect the elements of power, positioning and capital within the Finnish context that may contribute to inequities in mathematics achievement. Lastly, stage four highlights the positive potential of the existent social order of Finland’s social, political, and educational structures; this stage acknowledges the components of Finland’s current social structures and practices that can facilitate a resolution to the *social wrong*. This stage includes the identification of ways in which discourse may resist or contest through the medium of text and its semiotic components (Fairclough, 2013).

In order to demonstrate the application of these four stages within this analysis, a brief, and general example will follow. As previously noted, these four *stages* of analysis do not imply a particular sequence, and this example demonstrates this. In review of the document, *Quality and Equity in Education: Supporting Disadvantaged Students and Schools*, which is a publication from the Organisation for Economic Co-operation and Development (2012a), one particular figure, *How many students are at risk of low performance?*, illustrates students’ risk of obtaining a low score (a score below level 2) on the PISA based upon four different personal contributors: socio-economic status, parental education, immigrant status, and gender. The figure suggests that gender and immigrant status are two personal factors that impact Finnish students’

risk of obtaining a low PISA score. This indicates the presence and recognition of a social wrong, which is stage one of Fairclough's dialectical-relational approach. Within my full analysis, I will examine each of these social wrongs and any others that may arise; however, for this example, I will focus on the social wrong of immigrant status.

Delving into this social wrong, documents such as *Multilingualism as a Strength: Procedural Recommendations for Developing Finland's National Language Reserve* (Ministry of Education and Culture, 2017) reiterate the obstacles in Finland associated with divergence from the cultural norms: "A lack of proficiency in national languages is a barrier" (p. 25). Yet, this same document sheds light upon and demonstrates the awareness of inadequacies and an intent to address them: "the level of national support and expertise in native language teaching is low". The document subsequently suggests a plan to define the teaching qualifications for native language educators and promote language sensitivity in medical and legal sectors. These latter components shift the analysis from stage one to stage four, which acknowledges the positive potential of the current Finnish system(s). *Finland, a land of solutions: Strategic Programme of Prime Minister Juha Sipilä's Government* (Government Publications, 2015) also provides insight into constructive opportunities to address the social wrong. Within this document, and regarding the *Migration Policy* in particular, it states, "Immigrants enhance our innovation capacity and increase our know-how by bringing their cultural strengths to Finnish society" (p. 40). This statement suggests the government's encouragement and positive perspective of immigration. The document also notes an intolerance for racism and a recognition of the need for improvement with the mention of an independent study, which will be conducted to determine "better integration policies" (p. 40). While the plan for improvement is positive this also reiterates a deficiency regarding current and former integration.

This persisting barrier shifts the focus to stage two, which entails the identification of obstacles that may inhibit the social wrong from being remediated. In the publication *Finnish Education in a Nutshell* (Finnish National Agency for Education, 2017), the document discusses the attempts to support migrant individuals and individuals whose language is within the minority. Particular phrases indicate the presence of capital and a particular order among the languages. Finland has two national languages, Finnish and Swedish. The document notes that about 5% of schools instruct students in Swedish, which suggests that the predominant language is Finnish, but regardless, individuals who speak one of these two languages are ensured to have their *full* education, including higher education, presented in the language they speak. The publication proceeds to state that “there are education institutions where all or at least some instruction is provided in a foreign language, most commonly English” (p. 8). This statement reinforces the presence of capital; those who speak Finnish possess a degree of capital as that is the predominant language. Yet, those who speak Swedish also possess capital as there is a sense of security that their education will be provided in a familiar language. Migrant individuals who speak English possess less capital but are granted an advantage of migrant individuals who do not speak Finnish, Swedish, or English. There is also a degree of ambiguity in the statement above. Noting that *all or at least some instruction is provided* indicates that there is a variance in the amount of content that is provided in a foreign language and that it is not guaranteed. The statement also notes that instruction is presented *in a foreign language*. While the statement is elaborated upon and explains that English is often the foreign language, there is again a degree of ambiguity and the potential for inconsistency in the language that is presented and the frequency in which instruction will be provided in that language. These uncertainties create an imbalance in power and encourage the manifestation of *capital*. With recognition of this imbalance, the

question arises as to whether or not the Finnish infrastructure and social order *needs* this imbalance in order to maintain its current state and its current level of functioning. This question leads to stage three, which will be considered further within the analysis section of this inquiry.

Limitations

In order to recognize the potential flaws and attempt to identify and mediate the impact of methodological gaps within the analysis, the limitations of this inquiry must be acknowledged. Providing only an etic perspective in the analyses of text is one limitation of this inquiry. While a particular structure is in place with attempts to provide an objective analysis, and while artifacts that embody Finnish citizen's perspectives are included, my perspective, as the researcher, holds limiting implications. Lacking an emic lens, the complements of an "insiders" viewpoints and knowledge-based will not supplement this analysis.

Another obvious limitation within the analysis of the curriculum is the translation of the Finnish basic core curriculum and the upper secondary schools curriculum into English; this process of translating leaves opportunity for the curriculum's meaning to be reconstructed and subtleties within the text's to be lost or altered. The curriculum is available in Finnish and English, which indicates that though Finnish is the primary language of the culture, English is a predominant "outside" language that warrants accessibility to the curriculum. Regarding legislative documents, translations posed another limitation. Multiple legislative decrees and acts were available in English; however, the collection of these particular documents was confined to those that were available in English.

With regard to the curriculum documents, the years of their issuance pose a potential limitation in terms of alignment. With the basic core curriculum, the Finnish National Agency for Education states that, "The national core curriculum for basic education was renewed in

2014, and the new curriculum has been implemented in schools from August 2016” (“Basic Education”, n.d). Additionally, the Finnish National Agency for Education notes that 2015 was the year that the curriculum “for Upper Secondary Schools was reformed” (“General Upper Secondary Education”, n.d), and this curriculum was also implemented beginning in August of 2016. Therefore, when using the 2012 and 2015 PISA results and analyses, they do not provide insight into the influences of the curriculum texts that were used for this current inquiry; however, these assessment results do reveal the prior discrepancies in Finnish students’ performance, and they provide insights into the groups and/or demographics that were open to vulnerabilities in the Finnish education system preceding curriculum reforms. The pairing of these prior assessment outcomes with the revamped curriculum documents allows for examination of prior imbalances in students’ performance, identifiable imbalances in the current enacted curriculum, and finally, persisting educational imbalances that are noted in both prior performance and present curriculum. However, it does not allow for consideration of the direct impact of the current curriculum on students’ most recent PISA performance.

This leads to another limitation in the OECD analyses and the PISA data. Though the 2018 PISA was administered prior to the conclusion of this inquiry, the results of the assessment were not released for review within the time frame of this inquiry; therefore, analysis of the most recent PISA is not included and the latest PISA to be included in the 2015 administration—creating a lapse of over four years. Additionally, as each domain is rotated as the *major* domain, the 2012 PISA is the most recent assessment in which mathematics was the domain of focus. Therefore, some of the more in depth and nuanced analyses of the PISA results, that are specific to mathematics, are generated from this 2012 administration—over seven years prior to the time of this study. Such lapses in time, particularly when incorporating social and political elements in

this analysis, may provide information that is not representative of the current social and political climates.

CHAPTER 4: RESULTS

Research Question 1:

Question 1: What references to equity and power are visible in Finnish education and mathematics policy and curriculum texts?

Figure 2 outlines broader notions of both equity and power that were identified in the analysis of educational, political, and social texts. As illustrated in *Figure 2*, multiple themes, including *autonomy*, *flexibility*, and *gender*, intersected to indicate potential equities and inequities.

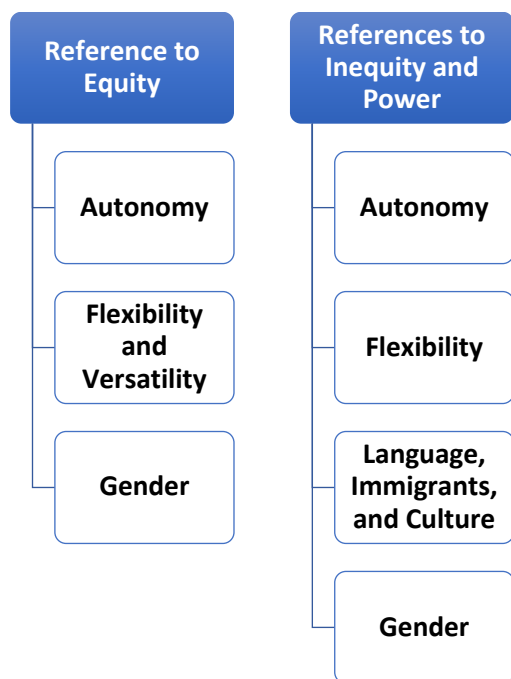


Figure 2. References to Equity and Power

Equity

Curriculum for Basic Education and General Upper Secondary Schools

Several themes emerged in the analysis of the National Core Curriculum for Basic Education 2014 (Finnish National Board of Education, 2016a) and the General Upper Secondary Curriculum 2015 (Finnish National Board of Education, 2016b). These themes demonstrate the

influence of culture in education and mathematics, and the equitable implications embedded within many of these themes were twofold; while the curricular themes provided evidence of equity and/or equitable intents, they also revealed potential imbalances, or capital, from which power could manifest. The autonomy bestowed upon local schools and students, the flexibility in educational approaches and perspectives, and gender are three instances where themes provide evidence of equity and also power. Equitable intents are both directly stated and alluded to through descriptions of cultural priorities and practices within the text of the Finnish basic education curriculum.

Autonomy. With regards to the local autonomy of schools and education providers, Finland's basic education curriculum emphasizes this educational freedom in its first chapter where it describes the importance of local decisions; it returns to and reiterates this localized autonomy in each of its eleven, subsequent chapters, which all have a section titled *Issues subject to local decisions*. While the basic curriculum must remain within the bounds of the national curriculum, the localized independence is intended to complement the national curriculum by tailoring its educational procedures and practices to the needs of individual schools or regions. These localized decisions include the language(s) in which instruction will be provided, the sequence of the basic curriculum, "how the opportunities for participation of guardians in different life situations are accounted for" (Finnish National Board of Education, 2016a, p. 12), "how local special features and needs" (Finnish National Board of Education, 2016a, p. 12) will be addressed, and which plans and programs will be implemented. The basic curriculum provides examples of such plans and programs and specifically notes, "a plan for gender equality" and "a cultural education plan" (Finnish National Board of Education, 2016a, p. 12). Each of these descriptions exhibits instances where localized decisions facilitate opportunities

for equal educational access and participation for students and guardians. This autonomy allows the education provider to cater educational decisions to the needs of its participants and, within the local school or municipality, consider, “how can the participation of pupils be ensured” (Finnish National Board of Education, 2016a, p. 46).

When discussing pupil welfare, the basic core curriculum notes that, at the local level, the goals for pupil welfare should be specified. The importance of students’ well-being within the basic curriculum is emphasized, and the curriculum requires the local educational providers to demonstrate the link between the plan for students’ well-being and the curriculum. Equitable intents are visible when the curriculum states that, “To ensure that the plans of all schools are sufficiently consistent, it is appropriate to include in the policies guiding the preparation of school welfare plans the basic structure of the plans and the issues common to all plans” (Finnish National Board of Education, 2016a, p. 86). The use of words and phrases, such as, *to ensure* and *consistent* indicate the intent for equity and efforts to diminish inconsistencies among schools. Descriptors, such as *sufficiently* and *appropriate* are arbitrary words that assume a cultural understanding. The identified *issues* (noted in the statement above) are culturally determined emphases that are mentioned within the basic curriculum but these *issues* are societal aspects that were deemed important or relevant in settings that extend beyond educational realms and may be indicative of cultural capital. The cultural perception that policy is the facilitator of consistency, and that consistency enables equity, is a cultural belief, and while autonomy is bestowed upon local providers, this statement also demonstrates efforts to minimize discrepancies in educational planning and access with this localized freedom through policy.

Within the upper secondary curriculum, the autonomy of local education providers is visible, but it is not as apparent as in the basic core curriculum. Instead, autonomy takes on a

different role with regards to students' equitable access to learning. Within the upper secondary curriculum, autonomy is perceptible through students' participation and decision making in *their* education and curriculum. This independent and active engagement addresses educational equity in two regards. First, at the start of chapter three, the curriculum states that, "The National Core Curriculum for General Upper Secondary Schools is based on a conception of learning that sees learning as a consequence of the student's active, goal-oriented, and self-directed actions" (Finnish National Board of Education, 2016b, p. 14). This word choice of *learning as a consequence* suggests that learning is the product or outcome of students' autonomous initiation, participation, and decision-making. This *active* role granted to students indicates that students guide the curriculum instead of the curriculum guiding students. In this case, students are able to mold education to fit their needs and their interests which in turn allows the curriculum to become accessible to *all* students. Second, the curriculum notes that, "Students who are aware of their learning processes are able to evaluate and develop their studying and thinking skills" (p. 14). This statement suggests that in becoming *aware of their learning processes* students acquire a form of cultural capital that enables them to *develop their studying and thinking skills*. The initial degree of autonomy that is afforded to students is perceived to contribute to their independence and continued learning and participation. This notion autonomy is multifaceted and visible throughout the upper secondary education curriculum.

In chapter four of the upper secondary curriculum, when discussing student welfare, a description of both communal and individual student welfare notes that welfare encompasses health, psychological, and social services for students, and is implemented to foster students' well-being, health, and safety so that they are able to participate in their learning environment. This comprehensive approach to support demonstrates equitable intents with its allocation of

well-rounded services to enable students' participation in education, but with regards to autonomy, the curriculum also demonstrates how students' initiative and independence in the process of providing welfare supports fosters equity. The curriculum notes that, "Each student must have an opportunity to participate in developing the operating methods of communal student welfare and to express his or her opinions on matters concerned with students and the school community" (Finnish National Board of Education, 2016b, p. 22). This opportunity for participation in *developing the operating methods* creates a dynamic in which students do not have to align with the communal student welfare, but instead, the welfare process must align with students. The autonomy granted to students signifies that educational processes shift to meet students' needs instead of requiring students to shift in order to conform to previously established educational processes. This practice diminishes the role of capital and promotes equity for students.

Similarly, with individual student welfare, students express their opinion and provide consent in order for welfare services to be implemented; students have an active involvement in the process of developing supports and solutions. "The premise is interaction in which the student is appreciated, his or her views are listened to, and trust is built" (Finnish National Board of Education, 2016b, p. 23). This *interaction* indicates an intent to encourage exchanges between educational actors, social actors and students in the welfare process. The use of *appreciated* and *listened to* suggests that students' voice and independent perspectives are not only valued but valued as equal to those of other educational participants. This same degree of student involvement occurs with the implementation of disciplinary plans: "Before adopting or updating the plan, the education provider must hear the student body and upper secondary school staff" (Finnish National Board of Education, 2016b, p. 28). As with welfare processes, the phrase

before adopting or updating the plan indicates that the implementation of a school's disciplinary plan is contingent upon the involvement and voice of both students and staff. The use of the word *must* stresses the curriculum's mandate for the inclusion students' and staff' participation in the process of implementing or revising a disciplinary plan. This same notion of student empowerment and autonomy is also visible in learning practices that the curriculum encourages.

The curriculum notes that, "During upper secondary school education, the students develop and diversify their learning-to-learn skills. The student learns to recognise his or her strengths and development needs as a learner" (Finnish National Board of Education, 2016b, p. 34). In a broad sense, this statement demonstrates a curricular expectation that upper secondary students take greater ownership for their learning. The curriculum encourages students to cultivate *their learning-to-learn skills*, which indicates that students are guided to identify and expand their metacognitive skills in order to take control of their own learning. In addition, as a student *learns to recognize his or her strengths and development needs*, he or she is self-reflecting, self-evaluating, and in doing so, becoming a more autonomous learner. Each of these identified curricular goals are facilitating students increased independence and autonomy in their own learning and education. The curriculum clearly states how this educational autonomy promotes equitable intents and, "strengthens the students' equal opportunities for developing their competence and making choices during their studies and on their future" (Finnish National Board of Education, 2016b, p. 35).

With regards to mathematics, autonomy is also visible in the upper secondary curriculum's mathematics objectives. The first two bulleted mathematics objectives suggest autonomous intents. The first proposes that the student, "gathers positive learning experiences and becomes accustomed to persistent work, and thus learns to trust his or her own mathematical

abilities, skills, and thinking” (Finnish National Board of Education, 2016b, p. 140). Students’ reliance upon their *own mathematical abilities, skills, and thinking* indicates that mathematics autonomy is the goal and *positive learning experiences* and persistence enable students to attain this mathematics autonomy. Additionally, the second objective proposes that the student “finds confidence to adopt experimental and inquiry-based approaches, discover solutions, and accesses these critically” (p. 140). This second objective again conveys intents to foster students’ mathematics independence by encouraging students to apply *inquiry-based approaches* and *discover solutions*. Each of these phrases conveys a freedom for students’ mathematics learning and problem solving that will “provide the student with the mathematical capabilities required in vocational and higher education studies” (Finnish National Board of Education, 2016b, p. 140). This autonomy facilitates students’ continued participation in secondary mathematics and in future mathematics-related careers. It is this continued participation that is indicative of students’ acquisition of cultural capital and agency, which in turn, sustains access and diminishes exclusion.

Flexibility and versatility. Flexibility and versatility are recurring terms that are used throughout the descriptions of the basic core curriculum and the upper secondary curriculum. Within these broad notions of adaptability, the curriculum applies flexibility and versatility in various facets of education, including its considerations of families’ unique life situations, differentiation of instruction, and assessment.

Life situations. Within the provisions of the local curriculum in chapter one of the basic curriculum, education providers are called to address, “how the staff and the pupils and guardians participate in the preparation, evaluation and development of the curriculum and how the opportunities for participation of guardians in different life situations are accounted for”

(Finnish National Board of Education, 2016a, p. 12). This statement indicates flexibility is granted in the consideration of both students' and guardians participation. By accounting for *guardians in different life situations*, the text shows the equitable intents noted in this statement. With consideration of various life situations, the basic core curriculum is extending its domain beyond the school setting to encompass the home, and it is attempting to diminish imbalances that may be present within households in order to provide equitable access for students and guardians. The statement intends to make the *preparation, evaluation and development of the curriculum* inclusive to families, not just in the implementation and participation of the curriculum, but in its conception and formation.

Discussion of collaboration between home and school is reiterated in chapter five when the basic curriculum notes that, "the diversity of families and their needs for information and support are taken into consideration" (Finnish National Board of Education, 2016a, p. 38), and the curriculum requires staff to "ensure versatile communication by other means" (Finnish National Board of Education, 2016a, p. 38) in order to guarantee this communication. The first statement indicates flexibility in the information that each individual family needs, when it notes *their needs*, and it also indicates flexibility with its assurance of adaptable modes of communication; this second statement alludes to a perception that a uniform approach to the type of information, the dissemination of information, and necessary supports required by each family is not preferred with its use of *versatile* and *other means*. Additionally, the latter statement notes that schools must *ensure* communication is facilitated. The use of *ensure* indicates equitable intents as it implies the curriculum's guarantee that this communication transpires between school and home.

Not only does the basic core curriculum account for unique home situations, but it also accounts for unique life situations specifically related to students and their ability to attend school. “Basic education may be organised by means of instruction provided in a hospital school, a reform school, a reception centre, a prison or some other penal institution” (Finnish National Board of Education, 2016a, p. 43). Again, this statement exemplifies the basic curriculum’s attention to unique life situations, its facilitation of students’ exposure to and participation in education, and its aims for making the curriculum and learning accessible to *all* students. Within this section, the Basic Education Act, the Child Welfare Act, and statutes of the National Core Curriculum, are referenced; mention of these legislative documents demonstrates the interconnectedness of the educational practices with political, legal, and social structures in Finland that embody the culture’s equitable intents.

Differentiation. Flexibility and versatility are also visible in the basic curriculum through differentiation, which is encouraged in the learning environment, disciplinary measures, instructional practices, tools, and supports that are established for students’ learning. Within chapter four, a section related to educational learning environment notes that students’ individual needs are considered and “learning environments tailored to meet support needs of pupils may be part of systematic support offered to them” (Finnish National Board of Education, 2016a, p. 31). This individualization of learning environments, and the *tailoring* of the setting to support students’ needs, indicates attempts to make the learning environment accessible to all. Specifically, with regards to mathematics instruction, the document notes that the basic mathematics curriculum, “offers the pupils diverse experiences that help create a basis for the formulation of mathematical concepts and structures” (Finnish National Board of Education, 2016a, p. 137). These *diverse experiences* are indicative of the versatility present in mathematics

instructional approaches. After describing the core mathematics objectives for grades one and two, the curriculum notes that various tools and pedagogical approaches are used in mathematics instruction, and it also states that “As pupils start school, their existing skills and possible differences in their competences are surveyed” (Finnish National Board of Education, 2016a, p. 139). Awareness of these differences indicates a cultural perspective and recognition of the need for differentiation, and this perspective provides a basis for the subsequent implementation of flexible and versatile approaches that facilitate an equitable environment for learning mathematics.

For grades three to six, the curriculum describes mathematics instruction as that which, “supports the development of the pupils’ skills in presenting their mathematical thinking and solutions to others in different ways and with the help of different tools” (Finnish National Board of Education, 2016a, p. 252). The phrases *different ways* and *different tools* indicate flexibility and openness to multiple perspectives and approaches as it pertains to mathematics. The use of the word *their* when describing students’ thinking suggests a recognition of students’ individuality and welcomes students’ unique perspectives when approaching mathematics; such a perspective is likely to encourage students’ participation in the content area. For grades seven to nine, the curriculum explains that the basis for instruction is dependent upon “topics and phenomena of interest for the pupils as well as on problems related to them” (Finnish National Board of Education, 2016a, p. 405). This indicates an attempt to make the curriculum relevant, and therefore accessible, to all students, and it also reveals the potential infusion of culture within mathematics instruction, as the presentation may be based on interests, occurrences, and experiences specific to Finland or Finnish culture.

The general upper secondary curriculum also demonstrates flexibility and differentiation in chapter five's description of students' literacy and mathematics instruction. In this chapter, literacy is approached in a very inclusive sense with the curriculum's consideration of multiple facets of text beyond written words: "Multiliteracy is based on a broad definition of text according to which texts are entities expressed by systems of verbal, visual, auditive, numeric, and kinaesthetic symbols and their combinations" (Finnish National Board of Education, 2016b, p. 39). This statement demonstrates a perspective that makes language and communication more inclusive; the numerous, and versatile, modes of literacy that are identified and assumed to be available to students and teachers facilitates increased participation in instruction and assessment.

With regards to mathematics at the upper secondary level, an initial intent that is identified is sustaining students' engagement in mathematics, "by familiarising him or her with the versatile meanings of mathematics to people and the society and its unique and fascinating nature as a field of science" (Finnish National Board of Education, 2016b, p. 139). This statement signifies an intent to make mathematics meaningful to students, and it reveals a cultural perception that mathematics has a personalized nature that manifests differently for different individuals and different societies. This perception accounts for the curriculum's descriptions of how mathematics instruction caters to students' interests and encourages various working methods in mathematics instruction; "the student is encouraged to develop creative solutions to mathematical problems" (Finnish National Board of Education, 2016b, p. 138). This statement reveals a perception and cultural approach to mathematics; it indicates that mathematics problems do not possess a singular approach to a solution but instead alternate paths towards obtaining solutions are welcomed within mathematics teaching and learning. Flexible

grouping, with both independent work and group work, is identified, and “versatile assessment and supportive feedback” (Finnish National Board of Education, 2016b, p. 138) are provided. These instances of flexibility in secondary instructional practices, working methods, and meaning making indicate attempts to make mathematics accessible and applicable to *all* students, which is indicative of equity.

Within each of the three grade level chapters (chapters 13, 14, and 15) of the basic education curriculum, the sections on mathematics each contain a subsection titled *Guidance, differentiation, and support in mathematics in grades 1-2, 3-6, or 7-9*, respectively. Within this subsection for grades three to six and seven to nine, the basic curriculum reiterates equitable intents with a recurring statement that each student has, “the opportunity for instruction also in the most central contents of previous grades if he or she lacks the sufficient command of them” (Finnish National Board of Education, 2016a, p. 254 and 405). The repeated use of this statement indicates an emphasis on *the opportunity* for review of and exposure to prior content; this notion indicates attempts to diminish differences in students’ mathematics proficiencies upon entering each grade. The curriculum continues with discussion of this *opportunity* when it notes the application of differentiation in mathematics instruction, “and the pupil shall have opportunities to experience success” (Finnish National Board of Education, 2016a, p. 405). The use of the word *opportunity* and *experience* indicates an awareness of ensuring accessibility and participation in mathematics instruction, and if necessary, support.

The upper secondary curriculum addresses *opportunity* in education with its recognition of diversity and the constraints that can influence opportunity: “Learning is diverse and bound to the activity, situation, and culture in which it takes place” (Finnish National Board of Education, 2016b, p. 14). First, this statement indicates a perception that learning varies and does not always

occur under the same conditions. This perspective provides insight into potential reasons for the recurring flexible and versatile approaches embedded within each of the curriculum documents. Second, this state demonstrates a cultural awareness of the influence that habitus, field, and doxa have upon learning with its recognition of the boundedness of *activity, situation, and culture*. While this statement does identify limitations that influence learning and opportunity, it also signifies a flexible mindset with regards to learning and education.

A tangential aspect of the learning environment that is incorporated into educational instruction is discipline. When discussing the implementation of disciplinary measures, the juxtaposition of two statements conveys equitable intents with concurrent messages of uniformity *and* also consideration of the individual. The first statement notes that, “The same sanctions must be imposed for similar acts regardless of who committed them” (Finnish National Board of Education, 2016b, p. 28); this mandates an evaluation of the *acts* and not the individual *who committed them*, and it requires equitable assessment of disciplinary measures. However, a subsequent statement in the basic curriculum notes that students’ age and developmental phase should also be considered. While this latter point does account for individual characteristics, and contradicts the prior appeal for uniformity, it also relays equitable intents with recommendations of differentiation in expectations based upon students’ age and development stage. This message demonstrates cognizance for students’ humanness, and the curriculum reiterates this notion when it states, “Disciplinary measures may not be used in a manner that is humiliating or degrading to the pupils” (Finnish National Board of Education, 2016a, p. 40). Again, this indicates an ethical, and equitable, perspective that is embedded within the culture and that transpire through this curriculum.

In chapter five of the basic curriculum, another application of differentiation highlights the flexibility afforded to educational providers and the versatility that is possible within local curriculum. With regards to planning, particular aspects are decided by the local education provider; the curriculum requires education providers to determine, “how can the participation of pupils be ensured” (Finnish National Board of Education, 2016a, p. 46). When describing grade-independent studies, it is noted that personal educational plans are an option that is allowable as an alternative to grade level instruction; the basic curriculum poses the question, “does the decision apply to all schools or only some schools or grades, individual pupils etc.” (Finnish National Board of Education, 2016a, p. 47). Therefore, with this option, educational providers must specify within their curriculum how the personal plans are to be used. Such possibilities enable education providers to customize curriculum to fit for a group of schools (under their leadership), one particular school, and/or one individual student. This demonstrates potential differentiation of the planning and preparation of an entire school building *or* the potential differentiation of instruction for individual students. If this differentiation occurs, the basic core curriculum requires education providers to identify the modules that will be studied, the divisions of lesson hours, and the modules that are mandatory versus those that will be optional. While this flexibility offers opportunities for personal education plans to be catered to schools’ and students’ individual needs, it also creates a threat to equity as there are more frequent instances where inconsistencies in educational participation and accessibility could occur; however, the basic curriculum’s bulleted list of the mandated criteria that educational providers must identify demonstrates attempts to reinforce educational provider’s compliance with national core curriculum. These simultaneous, but also conflicting, notions of differentiation and consistency create a bit of a conundrum.

When discussing services and aids, equity is clearly visible. The basic curriculum notes that assistive services “guarantee that the pupil has the basic preconditions for learning and school attendance, accessibility and opportunities for interaction on every school day” (Finnish National Board of Education, 2016a, p. 78). Interpretive and assistive supports are free, and they are described as a student’s *right*. “Vision, hearing, mobility or other physical needs” (Finnish National Board of Education, 2016a, p. 78) are examples of instances when assistive services and resources may be provided. These services and aids can include technological supports, various communication methods that augment or provide alternatives, or personnel to support students’ language and communication, which mediate barriers in order to make learning and instruction accessible.

In the basic curriculum’s descriptions of sign language instruction, a primary intent is, “strengthening the pupils’ identity as sign language users and their awareness of their own culture and the sign language community” (Finnish National Board of Education, 2016a, p. 91). The curriculum notes that, “Under the Basic Education Act, pupils with impaired hearing must also be given instruction in sign language when needed” (p. 91). The use of the word *must* suggests a certainty of the accessibility of sign language instruction. The phrase *Under the Basic Education Act* conveys the influence of policy in the curriculum and the mandate for the instruction to be provided as specified.

Assessment. The basic curriculum indicates that assessments are seen as a tool to foster learning and to promote students’ own abilities to self- assess. When explaining the role of assessment, the curriculum calls for the establishment of an assessment culture with “a supportive atmosphere” (Finnish National Board of Education, 2016a, p. 49), one that “promotes the participation of pupils” (Finnish National Board of Education, 2016a, p. 49), and one with

“fair and ethical assessment” (Finnish National Board of Education, 2016a, p. 49). These three phrases suggest intents to create an unthreatening and unbiased context for assessment. Following this bulleted list of criteria for an assessment culture, the basic curriculum notes the use of versatile methods, and it states that, “It is important to take into account the pupils’ different ways of learning and work approaches and to ensure that there are no obstacles to demonstrating progress and achievement” (Finnish National Board of Education, 2016a, p. 50). The mention of *pupils’ different ways of learning* indicates the incorporation of differentiation and consideration of students’ different *work approaches* indicates an openness to multiple perspectives and methods of learning. Additionally, when it states that an intent is *to ensure that there are no obstacles*, this alludes to attempts to eliminate barriers and boost students’ capital within the assessment process. For example, shortly after the curriculum’s mention that, “the accessibility of any aids that the pupils may need is ensured, and the required assistant services are provided” (Finnish National Board of Education, 2016a, p. 50). This description indicates intentions to remove obstacles and provide fair and equitable opportunities for students to demonstrate their competencies. Flexibility in the practices of assessment, such as, “the possibilities of using information and communication technology and giving oral demonstrations of knowledge and skills” (Finnish National Board of Education, 2016a, p. 50) allows for multiple, attainable instances for students to demonstrate proficiency and advance in their studies.

When discussing mathematics assessment, the basic curriculum reiterates notions related to the versatility and supportive nature of assessment. A positive image as a mathematics learner is emphasized, and its intents echo that assessment should support the maintenance of students’ desire to learn mathematics, which indicates attempts to sustain participation in mathematics.

The assessment process is described as providing students with regular feedback, and its intents are to foster their mathematics competency and resiliency. Students are described as actively involved in their assessment process, and they are encouraged to develop self-awareness of their attitudes towards mathematics and their learning practices; these intents again indicate efforts to maintain students' participation in mathematics. Assessments are described as lending themselves to flexible means for students to demonstrate their comprehension and application of mathematics content. This establishes an equitable approach for students' demonstration of their mathematics proficiencies so that they are able to progress in mathematics academic career.

In the secondary curriculum, mathematics assessment is also approached in a supportive way that motivates students and attempts to foster their self-confidence, self-evaluation and recognition of their own strengths and needs. These aspects of assessment facilitate students' independence with the mathematics content and encourage their continued participation. "The assessment guides the students in developing their proficiency in and understanding of mathematics" (Finnish National Board of Education, 2016b, p. 138). The use of *their* indicates an individualized approach that employs adaptability in students' distinct understanding of mathematics. The use of the word *guides* suggests a scaffolded approach to assessment that fosters students' mathematics abilities and promotes each students' continued participation in the content area of mathematics.

When discussing the composition of students' final grades, equitable intents are expressed when the basic curriculum states that, "The final basic education grades must be awarded on equal grounds" (Finnish National Board of Education, 2016a, p. 56). The use of the word *must* conveys an adamant and foundational condition for students' evaluation, which signifies an intolerance for inequity. As stated throughout this chapter on assessment, students'

performance must be evaluated “in proportion to” (Finnish National Board of Education, 2016a, p. 56) the established objectives, syllabi and assessment criteria. The repeated use of the term “in proportion to” within this chapter and discussion of a series of possible supports and pathways to the final assessment suggests flexibility, consideration of the individual student, *and* the uniqueness of the locally determined curriculum. Flexibility is visible with descriptions of various scenarios, such as “if the pupil has been exempted from a certain subject” (Finnish National Board of Education, 2016a, p. 57), “If the pupil has switched syllabi in mother tongue and literature” (Finnish National Board of Education, 2016a, p. 57), and “if the pupil has switched from one religion or culture, worldview and ethics subject or syllabus to another” (Finnish National Board of Education, 2016a, p. 57). Phrases such as, “feedback and guidance must be adequately detailed and individual” (Finnish National Board of Education, 2016a, p. 56) indicates the supportive, differentiated, and flexible nature of the assessment process; the curriculum also discusses assessment options for students receiving special supports, which include assessment using the general criteria or assessment “on the basis of the objectives and contents personally established for him or her and defined in the individual educational plan (IEP)” (Finnish National Board of Education, 2016a, p. 57). These descriptions again demonstrate the flexibility and individualization that is woven throughout the final assessment process. Lastly, the curriculum notes the possible use of school-specific objectives if a school “emphasises a certain subject or set of subjects in its curriculum or provides bilingual education” (Finnish National Board of Education, 2016a, p. 57).

Within the curriculum’s discussion of assessment, various educational certificates that may be issued to students at the culmination of their basic education experience are described. The basic curriculum also notes that a separate assessment may be arranged in order for a student

to demonstrate proficiency in the basic education syllabus or in portions of the basic education syllabus. Certificates for a student's "completion of a basic education subject syllabus", "partial completion of the basic education syllabus", and/or "completion of the basic education syllabus" (Finnish National Board of Education, 2016a, p. 62) may be awarded. This practice demonstrates the versatility present in the educational curriculum, its assessment practices, and its recognition of students' varying degrees of completion of the content. Equity is implied with such a practice as it recognizes students' individual participation, progressions and successes.

The upper secondary curriculum also notes the opportunity for students to participate in a separate assessment, and it explains that if students' demonstration of material is greater than that exhibited in the prior assessment, a higher grade will be awarded. Additionally, "if those making the decision on the student's assessment consider that, at the final stage of the subject, the student's knowledge and skills are more advanced than indicated by the grade" (Finnish National Board of Education, 2016b, p. 246), then a higher grade can be awarded. This practice demonstrates flexibility in the assessment process that allows students' proficiencies to be evaluated and reflected through multiple means; in providing this flexibility, students' opportunities for success are optimized and the accessibility of equal assessment processes is broadened.

Special Support. For students who receive special support, the basic curriculum describes two possible assessment practices. The first is that students who receive special support will be assessed based upon the general curriculum objectives; however, the second possibility is that students who receive special supports *and* have an individualized syllabus will be assessed based upon their individual curriculum and objectives that were tailored specifically for their education. With the latter assessment possibility, the mode in which students with an individual

education plan are assessed is flexible; students may be either verbally or numerically assessed. This indicates a high level of consideration for students' needs and capabilities within the instructional and assessment process. This flexibility with assessment demonstrates a coherence in the individualized instructional methods and content. It also demonstrates equitable intents as the flexibility and versatility that was implemented to reduce or eliminate barriers in instruction are also applied in order to continue to reduce and eliminate barriers in assessment.

In chapter seven of the basic education curriculum, it is noted that supports can be provided to students at one of three levels: general, intensified, and special support. While these levels of support may shift, a student accesses only one of these levels at a time. The various forms of support “include remedial teaching, part-time special needs education, interpretation and assistance services and special aids” (Finnish National Board of Education, 2016a, p. 64). The listing of these forms of support indicates various modes of providing support (through instruction and/or resources), various degrees of support (such as part-time support), and various reasons for special needs (interpretation of the curriculum suggests that special supports encompass students' language and/or physical barriers). Flexibility is noted, and required, to accommodate the evolving nature of a student's support and in order to tailor instruction to a student's individual needs. Equity is considered through discussion of how supports facilitate students' access to learning: “Attention shall be paid to the accessibility of learning and the prevention and early recognition of learning difficulties” (Finnish National Board of Education, 2016a, p. 64). The inclusion of supports for attendance in students' educational monitoring indicates a somewhat holistic approach of the basic core curriculum. Since attendance is influenced by factors outside of the physical school setting, the consideration of attendance

demonstrates a cultural cognizance of those outside, or peripheral, factors that contribute to students' learning.

Flexibility is again demonstrated through the degree and forms of supports that incorporate various teaching configurations, subject matter, and instructional activities. For example, intensified support uses “flexible teaching arrangements” (Finnish National Board of Education, 2016a, p. 66) within a general education setting, and students receiving special support may have their studies arranged by activity or subject. Part time special needs education is described as a proactive intervention with the intent “to reinforce the pupil’s capabilities for learning and to prevent difficulties in learning and school attendance” (Finnish National Board of Education, 2016a, p. 77). The description that supports *reinforce the pupils’ capabilities* suggests that supports are viewed as a mediator that facilitates access to learning. Coteaching, small groups and one on one instruction are noted as possible instructional structures where part-time support may be implemented. Within this discussion of part time support, linguistics and mathematics are provided as examples of when part-time supports may be provided: indicating the perceived importance of addressing concerns/needs related to these two content areas. Additionally, for students receiving special supports, an individualized educational plan is developed with particular “goals and contents of the pupil’s learning and school attendance” (Finnish National Board of Education, 2016a, p. 71).

Equitable access and opportunities for success in education are guaranteed for individuals, and this message is reinforced with references to the Basic Education Act, which is mentioned numerous times throughout chapter seven: “According to the Basic Education Act, those participating in education are entitled to sufficient support for learning and school attendance directly as the need arises” (2016a, p. 64). Beyond the overarching message of this

statement, the choice of words holds more nuanced implications. For example, *those participating in education* indicates that the subsequent text applies to all students. The word choice of *entitled* indicates a cultural presumption that access to and support with learning is a certainty. Though somewhat vague and arbitrary, the use of the word *sufficient* indicates intents to guarantee that necessary supports are received, and the phrase *as the needs arise* implies that a monitoring of and fluidity with these supports also exists in order to maintain equitable access to learning. With regards to mathematics, the curriculum provides a specific example of learning supports that could be provided: “various information technology applications, audio books, tools for illustrating mathematics or aids that support concentration may be used” (Finnish National Board of Education, 2016a, p. 78). This listing of support provides insight into various modes of support that are available to students, but it also provides insight into the doxa surrounding mathematics. Four types of support are noted in the statement above: *information technology applications*, *audio books*, *tools* and *aids*. Three of these four supports are somewhat general and are applicable across all content areas; these three supports would be *information technology applications*, *audio books* and *aids that support concentration*. However, one support, *tools for illustrating mathematics*, is assigned for a particular content area, and that area is mathematics. Inclusion of this phrase suggests that mathematics is perceived to be a unique content area that requires tools and supports that are tailored specifically this content area; mindfulness of these supports demonstrate the curriculum’s attempt to make mathematics, in particular, accessible to all students.

Gender. Introduced with reference to the Finnish Constitution, the basic curriculum identifies the Non-Discrimination Act and indicates that, “Nobody may be discriminated against on the basis of gender, age, ethnic or national origin, nationality, language, religion, belief,

opinion, sexual orientation, health, disability or other personal characteristics” (Finnish National Board of Education, 2016a, p. 14). This description encompasses an array of personal characteristics, yet, the first one listed is gender, which may be indicative that gender is highly prioritized. Additionally, immediately following the description of the Non-Discrimination Act, the Act on Equality between Women and Men is identified, and it is described as legislation that guarantees, “women and men have equal opportunities for education and training” (Finnish National Board of Education, 2016a, p. 14). The mention of this act related to gender, and the mere conception of such an act, indicates a degree of political and social scrutiny that has been dedicated to gender equality. This attention has filtered into the curriculum with its attention to equitable educational opportunities for both genders.

These two acts, the Act on Equality between Women and Men and the Non-Discrimination Act, are again paired together in chapter one of the upper secondary curriculum. When discussing the Act on Equality between Women and Men, the secondary curriculum notes that, “the education provider shall ensure that a school-specific gender equality plan is prepared in cooperation with staff and students annually” (Finnish National Board of Education, 2016b, p. 11). This statement reveals that the secondary curriculum requires schools to establish a plan to guarantee gender equality. The *school-specific* descriptor demonstrates the localized autonomy bestowed upon schools, but also the opportunity for schools to differentiate the plan to fit their individual school culture and students. Following this requirement for a school plan, the secondary curriculum encourages annual review of this plan, with the option for schools to instead carry out triennial reviews of their plans. Whether annually, or triennially, the mandate for consistent review of schools’ gender equality plans indicates cultural perception that gender equality is an imperative matter to address on at a local level; its constant review also suggests a

perception that gender equality is a matter that evolves or shifts and therefore requires regular monitoring and possible revision.

Following this discussion of the Act on Equality between Women and Men, the upper secondary curriculum describes the Non-Discrimination Act and states that, “the education provider shall ensure that the educational institution has a plan on the necessary measures for promoting equality” (Finnish National Board of Education, 2016b, p. 11). As with gender equality, schools must establish a plan that is *promoting equality*; however, one difference in the presentation and requirements of the Act of Equality between Men and Women and the Non-Discrimination Act is that the curriculum does *not* specify that the education plan related to the Non-Discrimination Act needs to be regularly revisited. While the Non-Discrimination Act holds similar implications with regards to the enforcement of equality, the curriculum does not specify that review or monitoring of this plan is required after it has been established. This may be indicative of doxa and an assumed tendency towards gender when considering equity. Additionally, the titles of legislation themselves indicate differences in specificity. Gender equality is exclusively addressed in its own act, yet, the Non-Discrimination Act could encompass discrimination on the basis of gender and several other individual, demographic attributes. This specificity of the Act of Equality between Men and Women suggests that gender equality takes priority over other forms of discrimination both in legislation and as it relates to the curriculum.

Another instance where gender is visible occurs in chapter two of the basic curriculum. When discussing the values of basic education, the curriculum states the belief that, “Education contributes to promoting economic, social, regional and gender equality” (Finnish National Board of Education, 2016a, p. 16). The first three aspects, *economic*, *social*, and *regional*, are

broader adjectives that describe systematic components of a society, but *gender* is the only individual demographic upon which equality is a focus. This may be indicative of the weight placed upon equalizing roles within this demographic in the Finnish society. Or, it may instead be reflective of a culturally perceived role of education, and a cultural perception that education has a more significant influence upon gender than other demographic characteristics. In either case, this statement exemplifies the curriculum's emphasis upon gender equality in education.

Chapter three's description of the mission of basic education explicitly describes capital, its various forms, and education's role of bolstering capital. It directly states its intent "to prevent inequality and exclusion and to promote gender equality" (Finnish National Board of Education, 2016a, p. 19). The curriculum elaborates upon this and alludes to minimizing gender stereotypes in education when it states that, "Basic education encourages girls and boys to study different subjects equally and promotes information and understanding of the diversity of gender" (Finnish National Board of Education, 2016a, p. 19). This statement encourages equal participation and engagement in mathematics (and other content areas) that may have been dominated by one gender, and it indicates the curriculum's attempts to diminish imbalances with regard to gender.

In chapters three and four, the basic curriculum discusses gender roles and notions of *field* and *doxa* are alluded to with regards to gender. When describing the consideration of school culture, it is noted that, "the school culture is shaped by both conscious and unconscious factors. The school culture affects those who are within its sphere" (Finnish National Board of Education, 2016a, p. 27). Mention of *both conscious and unconscious factors* indicates an awareness of *doxa* and its influence embedded within a school culture. Additionally, how this culture impacts *those who are within its sphere*, the curriculum is describing *field*. The fact that

the curriculum demonstrates cognizance of both doxa and field suggests an acute awareness of those factors that influence education and affect equity. Discussion of these *conscious and unconscious factors* is followed by discussion of gender roles, indicating that gender roles exemplify manifestations of doxa and field. The basic curriculum states, “models of interaction and language use as well as gender roles are passed on to the pupils” (Finnish National Board of Education, 2016a, p. 27). Recognition of the adverse impacts of field and doxa is followed by a call to reconcile these imbalances. Awareness of “impacts of traditional gender roles and other role models” (Finnish National Board of Education, 2016a, p. 25) are referenced with regards to guiding students’ interests and careers. Mention of the *impacts* of gender roles indicates a recognition of detrimental aspects of these roles, but it also demonstrates efforts to consider the influence of these prior roles in students’ decisions; this again demonstrates an attempt to minimize their effects and promote equitable participation.

Chapter four of the basic curriculum has a specific subsection titled, *Equity and Equality*. The curriculum defines equal treatment as the protection of individuals’ basic rights, participation, and support of individual needs. Following this, the curriculum notes a belief that the development of students’ gender identity occurs throughout their basic education participation, and it explicitly reference intentions for gender equality. Gender identity and gender equality are the only specific facets of identity, diversity, and equality that are noted within this section. This creates ambiguity as to whether or not other types of diversity, in addition to gender, are implied, and therefore, recognized and embraced. The sole mention of gender within this section holds cultural implications; it suggests that gender holds a degree of importance in the realm of education and its pursuit of equity. The curriculum’s mention of equity, followed by discussion of gender, also suggests that the notion of equity may be directly

associated with gender within the Finnish culture. These curricular descriptions provide instances where discussion of gender equality may be twofold. It is indicative of the curriculum's equitable intents, but these intents to maintain or rectify inequities might simultaneously be indicative of prior or current conditions of gender inequities in education. Regardless, the consistent discussion of gender equality signifies that it is a priority in Finnish education.

The basic curriculum continues with this discussion of gender in chapter four when it notes that, "the community encourages the pupils to recognise their potential and to study various subjects, make choices and commit to studies without gender-related role models" (Finnish National Board of Education, 2016a, p. 30). The use of the word *community* indicates a social cooperation and responsibility and an extension of participation in this belief beyond the classroom. *Their* indicates a perception that students' potential is specific to each pupil, and the statement also suggest that a degree of autonomy is granted to students to *make choices* independent of *gender-related role models*. This statement appeals for students to take their own educational path without conforming to prior gender roles, and by mentioning *various subjects*, the curriculum is also indicating equitable access to all educational content without bias. The basic curriculum reiterates this intent to remove gender-associations in learning and working methods when it states that, "attention is also paid to recognising and modifying gendered attitudes and practices" (Finnish National Board of Education, 2016a, p. 31). This notion reveals intents to not only diminish the influence of gender in students' choices, but it also indicates attempts to shift a mindset that may have been previously engrained in learning practices. Discussion of *attitudes* and *practices* alludes to notions of doxa and habitus as they relate to gender. While the above content does repeatedly indicate attempts to promote gender equity, it does also suggest that preconceptions existed (or exist) among genders within education. Some

of the grade level and content specific chapters in the basic core curriculum also discuss gender equality, gendered practices, and/or gender-related role models, yet, this text is not found in the grade level subsections related to mathematics. The absence of such discussion potentially indicates that mathematics is a content area that minimally *influences* or is minimally *influenced* by gender within Finnish society and education. However, these absences may instead simply be indicative a cultural perception that mathematics and gender are independent of one another.

PISA and OECD

PISA 2012. The 2012 Programme for International Student Assessment (PISA) included 65 countries, including 34 Organisation for Economic Co-operation and Development (OECD) countries and 31 partner countries and economies, “representing 80% of the world economy” (OECD, 2014a, p. 3). In the 2012 administration of the PISA, mathematics was the content area of focus, and Finland ranked 12th: obtaining a mean score of 519 compared to 494, which was the average mathematics score across OECD nations (OECD, 2014, p. 46). The OECD explains that, “To gauge the magnitude of score differences, 41 score points corresponds to the equivalent to one year of formal schooling” (OECD, 2014, p. 46). While still performing above the OECD average, Finland’s mathematics performance has declined since the 2003 administration of the PISA. However, Finland remains among the high-performing countries whose results indicate little variation in students’ scores. Additionally, Finland was among one of ten countries that, “combine high levels of performance with equity in education opportunities as assessed in PISA 2012” (OECD, 2014a, p. 12). In a four-square matrix that is titled *Performance and Equity* (PISA 2012, Results in Focus p. 13), the grid illustrates countries mathematics performance and educational equity as it pertains to social economic status. The OECD notes that, “the socio-economic status of students and schools does appear to exert a powerful influence on learning

outcomes” (OECD, 2014a, p. 13). The grid exhibits Finland’s above-average performance for both mathematics performance and equity in education opportunities, and the grid includes a notation that indicates the “strength of the relationship between performance and socio-economic status is below the OECD average” (OECD, 2014a, p. 13). This information suggests that there is little relationship between students’ mathematics performance and their socio-economic status in Finland.

On this same page as the *Performance and Equity* matrix, the OECD notes that the degree to which both student and school-level factors, such as immigrant status and school resource allocations respectively, “are associated with performance show that policies and practices have an impact on both equity and performance” (OECD, 2014a, p. 13). The OECD examines countries’ educational structures and division of resources with regards to equity in education; when considering Finland’s education infrastructure, the OECD identified the country’s “early detection mechanism, such as periodic individualized assessments of students by several groups of teachers” (OECD, 2014a, p. 14) as a feature that incorporates supports at an early stage and enables students to continue their academics at the same rate. Additionally, when considering the division of resources among schools, the PISA 2012 indicated that, “Fairness in resource allocation is not only important for equity in education, but it is also related to the performance of the school system as a whole” (OECD, 2014a, p. 26). The OECD then identifies a specific pattern related to mathematics—more equitable allocation of resources is aligned with higher mathematics performance; when referencing the allocation of resources, the OECD clarifies that these resources include staffing, instructional resources, physical learning spaces, and learning time. Finland is among one of three countries that the OECD explicitly identifies as demonstrating above average mathematics performance, and “in these countries, principals in

disadvantaged schools tended to report that their schools had adequate educational resources” (OECD, 2014a, p. 26). The OECD notes that in the principals in *disadvantaged schools* indicated that their schools had equal or more resources than those in advantaged schools. This demonstrates a systematic equity where resources minimize the creation or amplification of power dynamics in students’ education; however, assigning the label of *advantaged* and *disadvantaged* to schools, does signify that power is still present among schools in this country. Fortunately, Finland was among one of the OECD countries where less than 5% (OECD, 2014, p. 36) of students are considered *disadvantaged*. In a scatter plot titled *Allocation of resources and mathematics performance*, the graph indicates that Finland had the greatest equity in resource allocation, and its mathematics performance, while above the OECD average, fell just below the line or regression trend.

This sense of equity is also reflected in the OECD’s reports of Finland’s overall performance and general comparisons of students’ performance *within* Finland. It is noted that on the 2012 administration, Finland was a high performing nation, and with regards to equity, its results produced low variation in scores; low variation demonstrates that there was little discrepancy in mathematics performance, which is indicative of equitable educational access. One the mathematics portion of the PISA, less than 15% of Finnish students scored at or below a Level one (p.69), and 67.2% of Finnish students were proficient at a level three or higher, which indicates a score above 482 (OECD, 2014, p. 67).

Through this 2012 administration, “boys performed better than girls in mathematics in only 37 out of the 65 countries and economies that participated in PISA 2012, and girls outperform boys in five countries” (OECD, 2014a, p. 4). In 2003 Finland showed a gender gap in favor of boys in mathematics performance and “by 2012, the gender gap was narrowed by nine

points or more” (OECD, 2014, p. 74). Not only did the gender gap narrow by 2012, but in the 2012 administration, girls outperformed boys by five points (OECD, 2014, p. 122). The shift in favor of girls is not indicative of equity, but the narrowing of gender gap does suggest greater equity in mathematics education in Finland. Additionally, when comparing Finland’s mathematics results from 2003 with those in 2012, the change in the score point difference between genders in mathematics was statistically significant.

As previously stated Finnish girls outperformed boys on the mathematics portions of the PISA. When evaluating students’ problem-solving abilities, the gender difference was narrow, but girls again scored higher in this domain than boys, which contrasts the international trends related to gender. When considering gender differences in performance, the OECD projects that a reason for differences may relate to “the scarcity of women in leadership positions” (OECD, 2014a, p. 35). This projection is based upon the data, which indicates that in most nations, the students who perform highest on problem-solving measures are males. Finland is one of three exceptions where male and female students perform almost equally with regards to problem solving. Additionally, the OECD notes that in an extension of this examination, “the survey of adult skills (PIAAC) shows that among adults, top-performers in problem solving are mostly men (except Australia, Canada and Finland” (OECD, 2014a, p. 35). This demonstrates Finland’s resistance of international tendencies related to gender inequities on PISA performance, and it suggests that this resistance of international gender inequities extends into students’ adulthood and society.

PISA 2015. For the 2015 PISA administration, 72 countries and economies were included. The content area of focus for this administration was science, and Finland placed within the top five countries regarding mean science performance. Collaborative problem

solving, reading, and mathematics were secondary areas of assessment. Chapter five of the OECD's *PISA 2015 Results* examines the progression of countries' mathematics results from 2003 through the most recently publicized 2015 PISA. In this data, Finland's mean mathematics score ranked 12th with Denmark (OECD, 2016 p. 177), and the nation was identified as one of the countries whose score was considered "statistically significantly above the OECD average" (OECD, 2016, p. 177). Though Finland's performance remains above the OECD average, the nation's performance declined since the previous 2012 administration. However, according to the OECD's *Education GPS*, Finnish "girls' performance in mathematics is one of the highest among PISA-participating countries and economies" (p. 1) with girls obtaining a score of 515 and ranking ninth among sixty-nine countries and economies (OECD, 2017b, p. 1); additionally, the percentage of Finnish girls performing below a proficiency level of two on the mathematics portion was also among the lowest at 11.2% (OECD, 2017b, p. 1).

Education Policy

Finnish education-related acts and decrees. Throughout the Finnish Basic Education Act (1998), equity is at the forefront. With descriptions of the access to pre-primary education, which has the potential to diminish imbalances in individuals' economic status, as well the Basic Education Act's direct reference to equality and equity, this legislation demonstrates consistent intents to provide its students with equal educational access and participation. When describing the objectives of education, the second objective identifies that, "Education shall promote civilisation and equality in society" (Ministry of Justice, 1998, p. 1) and the third objective indicates that "the aim of education shall further be to secure adequate equity in education throughout the country" (Ministry of Justice, 1998, p. 1). These direct references to *equality* and *equity* demonstrate a cultural and political initiative to provide students with equity in their

education. The phrases *in society* and *throughout the country* indicate the intent for this equity to extend beyond the educational setting into the social context throughout the nation.

When discussing students' school, the Basic Education Act declares that students must be assigned, "a neighborhood school or some other appropriate place where education is given under Section 4(1) and (2) in his or her native language in which the local authority is obliged to provide education" (Ministry of Justice, 1998, p. 3). This statement demonstrates *flexibility* with regards to school placement, and the phrase *or some other appropriate place where education is given*, not only conveys the flexibility that is occurring in this school assignment process, but it also indicates the intent to differentiate students' education in order to provide that which is *appropriate* for their learning. This differentiation is also noted when the legislation states that education should be provided *in his or her language*.

Flexibility is also noted in the Act's discussion of the allowance for alternative foundations or associations to provide education "by medium of a foreign language, special-needs education, education according to a particular ideology" (Ministry of Justice, 1998, p. 3) or for students outside of the compulsory school age. Here, the Basic Education Act is demonstrating flexibility in order to facilitate equality; the legislation is taking into account students' linguistic needs, special needs, and religious needs with this provision to enable an alternate provider to serve as the educational entity. This flexibility demonstrates cultural versatility that extends beyond instructional practices resources, and it demonstrates broader, systematic flexibility. The legislation continues by noting that this alternative provider may also be allowed "on the grounds of national education and cultural needs" (Ministry of Justice, 1998, p. 3). This statement reiterates equitable intents and by attempting to address *cultural needs*, the Act is attempting to diminish power dynamics in the delivery of students' learning.

Special needs and special supports are a prevalent topic in the Basic Education Act. Three sections within the Basic Education Act address various forms and degrees of support for students' learning. Section 16 addresses *Remedial teaching and part-time special-needs education* (Ministry of Justice, 1998, p. 7), Section 16a describes *Enhanced support* (Ministry of Justice, 1998, p. 7), Section 17 is titled *Special-needs support* (Ministry of Justice, 1998, p.8), Section 17a includes a *Plan on individual teaching arrangements* (Ministry of Justice, 1998, p.8), and Section 18 addresses *Special teaching arrangements* (Ministry of Justice, 1998, p.9). The specificity that is included in this Act related to special supports signifies an emphasis placed upon meeting students' need and enabling students' equitable access and participation. Additionally, the text's elaboration upon *special-needs* is indicative of the versatility that is applied in both instructional supports and arrangements, and it is suggestive of the frequency in which *special supports* are applied within the educational context.

Financial components of education are also addressed in the Basic Education Act and their presence signifies intents to diminish economic power among students. In a section titled *Free education*, this legislation states that, "textbooks and other learning materials, and school equipment and materials shall be free of charge for the pupil" (Ministry of Justice, 1998, p. 13). This statement demonstrates the degree to which this Act attempts to provide for students' education, and it is indicative of a political directive that reduces the potential for the manifestation of capital within students' education and their access to learning. With regards to before and after school activities the Act notes that these activities aim to, "promote children's welfare and equality in society and prevent exclusion and promote inclusion" (Ministry of Justice, 1998, p. 23)

Cultural influences in education and mathematics. Published by both the Finnish National Agency for Education and the Ministry of Education and Culture, *Finnish Education in a Nutshell* (2017) delves into various aspects of Finnish education from the lens of these two governmental ministries. Following the table of contents, the first section of the brochure is titled *Equity in Education*. Within this section, the brochure elaborates upon how Finnish education is free from pre-primary education all the way through higher education. Additionally, the text notes that, “the textbooks, daily meal and transportation for students living further away are free for the parents” (Finnish National Agency for Education, 2017, p. 6). As with the policy documents, the extensive coverage of students’ educational needs supports equitable access and facilitates diminished economic inequities. Two additional subsections describe how “Every pupil and student has the right to educational support” and another subsection notes that, “Special needs education is generally provided in conjunction with mainstream education” (Finnish National Agency for Education, 2017, p. 7). The titles of each of these subsections reveal the cultures attempts to maximize students’ inclusion and participation in education

Inequity and Power

As previously described, themes that emerged from the curriculum and education policy documents, demonstrate the equitable intents of the educational and mathematics culture in Finland. Yet, with some of these themes, dual meanings that simultaneously provide evidence of equity and/or equitable intents also reveal the doxa that are present in the culture. These doxa can externalize as power within the culture, within education, and within mathematics, and consequently, have the potential to create imbalances in students’ physical and epistemological access to educational materials, participation, experiences, and achievement. As previously identified, autonomy, flexibility and versatility, and gender are examples where identified themes

embody equity; however, while each of these themes do convey intended equity, they also demonstrate the presence of power. The basic core curriculum and the curriculum for upper secondary schools disclose these concurrent themes, which reveal potential inconsistencies and imbalances that generate power within education and mathematics.

Curriculum for basic education and general upper secondary schools

Autonomy. Potential inequity is demonstrated in chapter five of the basic core curriculum within the subject that describes and is titled *Issues subject to local decisions*. This subsection describes that the “school-specific curriculum and/or annual plan” (Finnish National Board of Education, 2016a, p. 46) are determined by the education provider. As a whole, this phrase demonstrates the autonomy granted to local education providers, but while the descriptor *school-specific* indicates that decisions are tailored to each individual school, it also indicates that each school has a distinct curriculum and practices. While this individualization and local choice has the potential to make the curriculum more accessible, it may also make the curriculum more inaccessible; this potential inaccessibility and/or inconsistency is exhibited in subsequent curriculum text. For example, a section on distance learning begins with the phrase, “If distance learning is used...” (Finnish National Board of Education, 2016a, p. 47), the section on grade-independent studies opens with, “If the education provider offers the possibility of progressing according to a personal study plan...” (Finnish National Board of Education, 2016a, p. 47), and the descriptions of flexible basic education, are introduced with, “If the education provider offers activities within flexible basic education...” (Finnish National Board of Education, 2016a, p. 48). Distance learning, grade-independent studies, and flexible education provide alternate modes of learning and exemplify the flexibility and versatility of the curriculum. However, with regards to availability of these alternate modes, the autonomy bestowed upon the educational providers

establishes a platform where the providers serve as the gatekeepers to the accessibility of these learning modes. As illustrated with the use of the conditional word *if*, distance learning, grade-independent studies, and flexible education are not guaranteed to be accessible to all schools and to all students. This phrasing is a signifier of inequity as it suggests that these learning modes are not available to all. While the use of *if* may be indicative of the flexible nature of processes in determining *if* a student or school requires support, its use in context does not clarify this. For example, as noted above, the recurrent phrase, “If the education provider offers” (Finnish National Board of Education, 2016a, p. 47, 48) merely demonstrates that education provider determines what is provided, and it is this ambiguity, and the potential for the availability of flexible practices to be driven by one authority, the education provider, that holds vulnerabilities in the autonomous nature of determining local practices and local offerings.

When examining the descriptions of these alternate learning modes, including distance learning, grade-independent studies, and flexible education, autonomy and flexibility are again visible; education providers are responsible for determining multiple aspects of these learning modes. The basic curriculum provides a description of instances when and why flexible basic education may be provided; it notes that flexible education provides opportunities for students “who are assessed to be at risk of exclusion from further studies and working life” (2016a, p. 42). While the establishment of flexible grouping demonstrates equitable intents, the curriculum is also acknowledging the existence of imbalances in education with this statement. Those students who are considered *at risk* possess less power and less capital within the field of education. If these students are in jeopardy *of exclusion*, this indicates that these students are more likely to have diminished power and diminished access to educational opportunities. Consideration of students’ exclusion *from further studies and working life* signifies that the presence of this

diminished power and diminished capital in basic education can impact *at risk* students' pursuit of higher education and careers. Therefore, if students who are *at risk* do not attend a school where the educational provider offers flexible basic education, it is not guaranteed that the needs of *at risk* students will be addressed. The flexibility of education providers to determine *if* a school provides flexible education signifies a clear instance for inequity and power; this inequity and power are not only conceivable among students who are considered to be *at risk* versus those who are not, but this inequity and power are also plausible among those students who are at risk and have access to flexible education versus those who are at risk and do not have access to participation in flexible grouping.

Within chapter six of the basic core curriculum a subsection titled, *Instruction emphasizing a certain subject or a special task and final assessment* indicates exactly what it states –that schools may place a greater emphasis on a particular subject or set of subjects. Within this same subsection of the curriculum, it is described that:

If the school emphasises a certain subject or set of subjects in its curriculum or provides bilingual education, the school-specific objectives of instruction in this subject or language are usually set higher than the objectives in the National Core Curriculum. In the interest of equality, however, the pupils' performance in instruction with a certain emphasis or bilingual education shall also be assessed in proportion to the national objectives... (Finnish National Board of Education, 2016a, p. 57).

Several aspects of this statement have equity-related implications. First, since the objectives are *school-specific*; this again demonstrates the autonomy granted to schools but it also indicates that students are not getting exposure to the same type and/or degree of particular content. Second, this statement then notes that with this different content, there are generally different

expectations, which *are usually set higher* than those of the national curriculum. The use of the descriptor *higher* also reveals a tiered perspective of the *school-specific* curriculum and the national core curriculum. When comparing the two curricula, it seems that the school-specific curriculum possesses greater capital. This inconsistency in expectation is followed by a statement that intends to promote equity when it notes that students are *assessed in proportion to the national objectives*. While this may provide a more uniform assessment and possibly address inequities, the uniformity could also highlight the differences in the content that students were exposed to; students in one school may have had greater emphasis placed upon one particular subject than another, but with assessment of national objective, all students are expected to perform to the same extent regardless of the emphasis, or lack of emphasis, placed upon content within their individual schools.

Chapter seven of the basic curriculum addresses learning and attendance supports. As with each chapter in the basic core curriculum, the final section of chapter seven describes *Issues subject to local decision*. The autonomy granted to local education providers with regards to the learning supports and attendance is described in this section. With this responsibility, the curriculum requires that local educational entities include the applied procedures, practices, and arrangements for supports that are decided at the local level; “the local curriculum shall contain decisions on and descriptions of the practical arrangements for providing support in as concrete terms as possible” (Finnish National Board of Education, 2016a, p. 79). The phrase *practical arrangements* demonstrates the versatility of local educational entities and their freedom to plan, prepare, and provide supports that are functional for the local culture. The statement above also notes that these arrangements must be defined *in as concrete terms as possible*. This requirement for *concrete terms* demonstrates the curriculum’s attempt to hold local entities accountable for

identifying the means by which feasible supports will be provided; however, this firm accountability is somewhat negated by the modifier *as possible*, which diminishes the degree of accountability with which local education providers must conform. Within this section, and multiple other pages of the basic core curriculum, the phrase, “as decided by the education provider” (Finnish National Board of Education, 2016a, p. 80) appears. This demonstrates the significant role and influence that the education providers have in how the curriculum transpires as the localized level. As with other areas of education and learning described within this curriculum, there is the potential for discrepancies, imbalances, and/or inequities in the access, implementation, and participation of students as it pertains to their supports due to possible differences in the decided upon *arrangements*.

Flexibility. The first chapter of the basic core curriculum is titled *The significance of local curricula and the local curriculum process*. Presented as the first chapter in the curriculum for students’ foundational education, the localized aspects of education are emphasized. As noted in the title, the *local* characteristics of Finnish education include not only the actual educational curriculum and content but also the *process* interwoven in the formation and fruition of the curriculum. The title’s description indicates the presence of a localized mindset in education, and its infiltration in educational products and practices. The first chapter of the basic education notes that, “The local curriculum complements and emphasises the goals, policies that direct the activities, key contents and other aspects related to the organisation of education specified in the core curriculum from a local perspective” (Finnish National Board of Education, 2016a, p. 9-10). This statement specifies the all-encompassing role of local culture in education curriculum. Within the context of this statement, the word *emphasizes* indicates the presence of partiality, and also flexibility, afforded to education providers: allowing educational entities to decide how

the local curriculum may hone in upon particular educational content, practices, or contexts that are favored locally. This freedom is reiterated with the phrase *from a local perspective*, which demonstrates flexibility with regards to the interpretation of the core curriculum. However, with this flexibility, *from a local perspective*, also suggests that the local doxa are infused within the interpretation of the core curriculum. Acceptance of localized interpretation holds implications with regards to equity and interplay of the delivery and reception of the curriculum text. While it is visible that the Finnish nation imparts cultural principles upon its national core curriculum, the statement above indicates that the curriculum invites culture interpretation, or reception, of the national content at a localized level. This autonomy allows for freedom and flexibility in the national core content, but it also creates additional vulnerabilities, and possible discrepancies, in equitable access and educational opportunities with these flexible interpretations.

In addition to the educational content, while a degree of flexibility is implied with the phrase *other aspects*, ambiguity is also generated with this vague word choice. This word choice extends the scope of ambiguity to all areas of education with the broad terms, *other aspects*, which can encompass an unknown variety of educational facets. This ambiguity can again lead to power imbalances and potential inequities for students' access to these *other aspects* of education, which could subsequently jeopardize their participation in learning.

Additionally, this statement indicates that the local education providers are called to interpret *policies that direct the activities and other aspects related to the organisation of education* from their perspective. Localized interpretation of policies has the potential to compound power dynamics that may already exist within the local culture as the perspective of those with greater cultural capital will steer the policies and educational infrastructure. For example, the local curriculum establishes, "possible sustainable development or cultural

education plans and any other plans formulated and decisions made by the education provider that particularly concern education, children, young people and families” (Finnish National Board of Education, 2016a, p. 10). If a particular culture, cultural perspective, or cultural value dominates a local school or community, then this perspective or value may be selected or incorporated in cultural education plans.

The general upper secondary curriculum describes both learning supports and individual student study plans and the flexibility embedded within these facets of education. With regards to learning and study supports, the curriculum’s commitment to inclusive supports for pupil’s holds clear equitable intents when it states that, “Accessibility of learning, and the prevention and early recognition of learning difficulties are crucial” (Finnish National Board of Education, 2016b, p. 20). This statement indicates attempts to identify, diminish, and address learning difficulties as early as possible in a students’ academic career, and it suggests an intent to remove any barriers that may be present with its consideration of the *accessibility of learning* through flexible practices. Additionally, within this discussion of support, the secondary curriculum references students as *human beings* which indicates a perception of students that is free of social, cultural, or political influences. However, when discussing supports, the curriculum also implied potential shortcomings: “The student may be temporarily fallen behind in his or her studies, or the need for support may be caused by, for example, a linguistic, mathematical, motor, or attentive disorder” (Finnish National Board of Education, 2016b, p. 20). This statement may be indicative of more common manifestations or areas where learning difficulties occur at the secondary level, including mathematics. The phrase that notes *the need for support may be caused by* is alluding to characteristics or qualities where barriers are present. *A linguistic, mathematical, motor, or attentive disorder* are identified as *causes* for a need for support. This

perception acknowledges that a misalignment or imbalance in capital is present when one of these qualities is present; through the curriculum's demonstration of flexibility with its reference to supports, the statement also identifies instances when one of the above characteristics impacts a student's ability to participate and perform within their learning context and requires supports in order to compensate for these imbalances

With regards to final grades, the curriculum also notes, "If the pupil has been exempted from a certain subject that is part of the basic education syllabus under a decision referred to in Section 18 of the Basic Education Act, no assessment is carried out in this subject" (Finnish National Board of Education, 2016a, p. 57). This statement again indicates flexibility by making allowances for exemptions, but there is also a sense of ambiguity; while alternate learning arrangements are elaborated upon, to a degree, in Section 18 of the Basic Education Act (1998), the curriculum does not include this information. The Basic Education Act (1998) alludes to a process in which a parent or guardian can inquire about special arrangements stating that, "If the pupil's parent/carer has not proposed learning arrangements in a manner referred to in subsection 1 or in provisions enacted by virtue thereof, the parent/carer shall be given an opportunity to be heard before the decision is made" (Ministry of Justice, 1998, 9). This statement in the Basic Education Act indicates equitable intentions, but it also reveals how cultural capital is advantageous. Noting that parents are *given the opportunity* suggests that parents are being "granted permission" to participate in the decision process. This permission or approval demonstrates the presence of power structures within educational processes as the Basic Education Act is assigning authority to another to *allow* the parent or carer to speak. Also, to a degree, this statement assumes that parents or caregivers are aware of processes related to the request for when it alludes to parents' proposal of *learning arrangements*. Awareness and

understanding of the protocol associated with educational processes equips the parent or carer with a degree of capital in the educational field, which in turn, transfers this capital to the student as the parent or carer is serving as their advocate. Also, while this educational process does provide an opportunity for parents *to be heard*, this statement signifies the doxa that are present within Finnish formalities where a parent or guardian's proposal is made *in a manner referenced in subsection 1 or in provisions enacted by virtue thereof*; the phrase *in a manner* signifies that there is a specific way in which a parent or carer's proposal should be conveyed – this assumption demonstrates how policy statements are infused with culturally underlying views and practices. Though the statement from the Basic Education Act is not directly included in the curriculum document, the influence of the Basic Education Act upon the curriculum is evident with its direct reference in the curriculum text; with this reference, the Basic Education Act is understood to possess governance over the practices that transpire within the curriculum, which demonstrates the presence of established, and assumed, power structures within the political and educational fields.

Language, Immigrants, and Culture. The notions of individualized syllabi and exemption are also discussed in chapter seven of the basic core curriculum. Flexibility, adaptations to instruction and support are described and the Basic Education Act is directly mentioned or indirectly referenced frequently in this discussion. One statement that has the potential to indicate inequities states:

Issues such as linguistic and cultural background, absences, lack of motivation, shortcomings in the studying techniques or challenges in behaviour may not as such be used as grounds for individualisation of a syllabus, and the pupil must be supported in coping with these issues. (Finnish National Board of Education, 2016a, p. 73)

This statement groups demographic aspects, such as language and cultural, with unrelated, behavioral aspects of a student's learning. Additionally, language and culture, as well as the other components listed, are described as *issues*, which possesses a negative connotation. While other aspects of the curriculum explicitly state the openness to and embracing of various languages and cultures, this statement, and its wording, seem to contradict openness and acceptance. Instead labeling language, culture, and each of the above as *issues* suggests the presence of power and a dominance over students with the components noted in this statement; it indicates that any of the descriptors above, such as language or culture, are perceived as barriers. The curriculum is acknowledging obstacles in students' educational path, and it is indicating that *the pupil must be supported in coping with these issues*. This phrase indicates flexibility with education alternatives that may facilitate students' participation, but it again reiterates the presence of a misalignment of the general educational path and these *issues*, which diminishes students' capital and acknowledges that there is a barrier students must overcome.

Chapter nine of the basic core curriculum is titled *Special questions of language and culture*, and notes that, "Common goals and principles laid down in the core curriculum for basic education are complied with in the instruction of all pupils" (Finnish National Board of Education, 2016a, p. 90). The use of the word *principles* suggests that cultural undertones guide the core basic education curriculum and have the potential to influence the educational approaches related to language and culture. It is noted that students' linguistic abilities, cultural background and identity are taken into consideration and supported in basic education in various ways. This discussion indicates awareness and support for students' diverse languages and cultures, and this is reiterated when the curriculum states that, "The pupils are guided to know about, understand and respect each citizen's right to their own language and culture protected

under the Constitution” (Finnish National Board of Education, 2016a, p. 90). This statement embraces clear cultural values, that encourage respect, acceptance, and protection; yet, equity may not be fully implied for all individuals as the use of the word *citizens* assumes a national membership or field. A question that arises with this use of *citizens* is whether refugees and immigrants who have not yet obtained Finnish citizenship would have access to the same rights and same education. The direct reference to the Constitution solidifies that respect, acceptance, and protection are values of the nation, but it also reiterates the presence of cultural capital by implying that these are values imparted upon citizens.

The curriculum notes that students are guided to “appreciate different languages and cultures” (Finnish National Board of Education, 2016a, p. 90); the use of the word *appreciate* suggests that language and culture are not just accepted or recognized, but they are valued. The curriculum also recognizes that students’ culture and language may extend beyond themselves to include their guardians and community: “the knowledge that the pupils and their guardians and communities have of the nature, ways of living, history, languages and cultures in their own linguistic and cultural areas are drawn upon in the instruction” (Finnish National Board of Education, 2016a, p. 90). This statement recognizes the carryover of students’ culture into their learning and indicates that curricular instruction accounts for this influence of culture. However, in this context, use of the words, *their own* indicates that students with different cultures and languages are not perceived to be within the Finnish culture or field; this view indicates that individuals with different cultures or languages are perceived as outsiders, which creates an imbalance in cultural capital that is not explicitly stated or acknowledged (doxa). Additionally, when discussing students’ linguistic skills, it is noted that learning plans may be implemented for students if needed; “this plan contains similar elements as a learning plan drawn up for

intensified support” (Finnish National Board of Education, 2016a, p. 90). While this statement does reference accommodations, supports, and attempts to facilitate students’ learning, it suggests that limitations and/or barriers are present that necessitate additional or supplemental support. This statement provides another instance where the need for support demonstrates a willingness to provide adaptations or accommodations, but it also signifies a misalignment among the learning environment and students with a different language or culture.

Language and Culture. The curriculum then states, “Under the Basic Education Act, the language of instruction shall be either Finnish or Swedish. The language of instruction may also be Sámi, Roma or sign language” (Finnish National Board of Education, 2016a, p. 90). Finnish and Swedish are explicitly identified as the accepted languages within this country and the direct reference to legislation highlights this point. Additionally, the order and separation of Finnish and Swedish from Sámi, Roma, and sign language indicates an intentional distinction and culturally perceived hierarchy (capital) among the languages. Though the words in the curriculum state that all five languages are accepted, a power dynamic is palpable, and it is evident that Finnish and Swedish are the preferred languages; this propensity may transpire within the instruction and learning environments and create imbalances or inequities as it has clearly infiltrated this curriculum document.

The first subsection within chapter nine of the basic curriculum addresses the Sámi culture and language. The opening sentences indicate encouragement, opportunities, and educational facilitation and flexibility for students to pursue and embrace their Sámi culture and heritage. The curriculum notes that, “pupils living in the Sámi homeland who are proficient in the Sámi language shall be primarily taught in Sámi” (Finnish National Board of Education, 2016a, p. 90). This indicates a geographical separation that is influential in the instruction and

language that a student learns. This raises a question as to whether or not students who reside in a Sámi region and who are instructed in Sámi language tend to maintain a separation throughout their entire education *and* beyond in their professional and personal paths. The statement above demonstrates support for pupils to practice the Sámi culture, but it is unclear whether the instructional and professional separation may have the potential to isolate Sámi from participating fully in the broader Finnish culture. The curriculum describes intents related to students' instruction in the Sámi language, and it is noted that, "As the pupils learn to use the language in a manner characteristic of their community, their membership and participation in the community are strengthened" (Finnish National Board of Education, 2016a, p. 90). This statement describes the acquirement of the Sámi language as a means to attaining cultural capital within the Sámi community; again, this raises the question as to whether this facilitates a social and cultural separation for students and members of the Sámi community. If it does, there is the potential for inequities and imbalances. While the statement above indicates that a students' cultural capital is strengthened within the Sámi community, it is not clear as to whether the students' cultural capital is strengthened, diminished, or unchanged within the larger national community. Students' participation is referred to in this subsection as in previous sections of the curriculum.

The Roma language is also addressed in chapter nine of the basic core curriculum, and the brevity of the subsection is immediately visible as the section is comprised of two short paragraphs. The especially brief length of this subsection reveals implications as to where the Roma culture is prioritized by the curriculum. As with the subsection on Sámi culture, this subsection for the Roma culture notes intents to support students' development of their cultural identity and heritage. It also indicates the intent to preserve the Roma culture and language.

While it explicitly states this intent, several statements within this short description indicate imbalances and/or inequities and do not align with the intent to support, foster, or preserve the Roma culture or language. It is stated that, “The education must account for the position of the Roma population in Finland as an ethnic and cultural minority” (Finnish National Board of Education, 2016a, p. 91). By identifying the Roma culture as a minority, the curriculum immediately indicates and acknowledges that there is an imbalance in cultural capital, and individuals who speak the Roma language or participate in the Roma culture have less cultural capital within Finnish education. The presence of capital is essentially affirmed in the statement above when it notes that *the education must account for the position of the Roma culture*. This statement acknowledges that individuals of the Roma culture have less *power* and suggests that their education will exemplify this marginalized positioning. This is a clear instance of inequity in terms of access and opportunity within education for this particular culture set in Finnish society, and specifically in Finnish basic education.

The curriculum addresses students who speak other languages in a subsection titled *Other plurilingual* pupils. As with the subsections on the Sámi and Roma languages and culture, students’ identity is initially stated, suggesting equitable intents. Following this description, the curriculum states, “The pupils’ backgrounds and initial situations, including their mother tongue and culture and the length of their stay in Finland, are taken into account in the instruction” (Finnish National Board of Education, 2016a, p. 91). Phrases in this statement, such as *initial situations* and *length of their stay* suggest that the accessibility of instruction and/or supports may fluctuate based upon these factors; this fluctuation indicates the potential for imbalances and inequities in access, participation, and level of support. Furthermore, the curriculum states, “The learning and use of their mother tongue thus support the assimilation of

the content in various subjects” (Finnish National Board of Education, 2016a, p. 91-92). This statement discloses the doxa present with the primary intention and focus being the alignment of individuals with the Finnish languages and/or culture. Students’ use of their mother tongue is perceived as a tool to assimilate to Finnish culture. Subsequently, the curriculum states that, “Under the Constitution of Finland, each person living in Finland has the right to maintain and develop their own language and culture. An effort is made to offer the pupils instruction of their mother tongue” (Finnish National Board of Education, 2016a, p. 92). These two statements are indicating that individuals have the freedom to use and practice their own language/culture (passive support), but the phrase *an effort is made* also indicates that it is not guaranteed that their language/culture will be actively supported/facilitated. The importance of assimilation is again reiterated in the curriculum when it notes that, “instruction of the Finnish or Swedish language may be delivered to immigrants either fully or partly following a specific syllabus intended for immigrants” (Finnish National Board of Education, 2016a, p. 92) in place of mother tongue and literature, as per a Government Decree. This decision demonstrates that the Finnish and Swedish languages are superseding other content within this basic education curriculum as per a Government Decree; mention of the Government Decree indicates implementations of a higher or broader legislative authority than the Basic Education Act and implies a national-level intent and belief (doxa). Lastly, the curriculum directly indicates and alludes to cultural capital within education and school culture:

The pupil then studies the syllabus for Finnish or Swedish as a second language if there are deficiencies in one or several aspects of the pupil’s basic Finnish or Swedish language skills, in which case his or her competence is not adequate for acting as an equal member

of the school community in daily interaction and school work (Finnish National Board of Education, 2016a, p. 92).

This statement is a clear indication of, recognition of, and acceptance of, the predominance and power of language within Finnish education and culture. The phrase *acting as an equal member* explicitly describes the capital that manifests from *deficiencies* in a student's language skills, and the phrase *in daily interaction or school work* demonstrates the extent to which language and cultural capital contribute to or inhibit students' participation and power within an educational field.

Chapter four of the upper secondary schools curriculum is titled *Guidance and support for students*. The chapter addresses topics related to guidance, student welfare, and discipline, but the final subsection of this chapter is titled *Questions of language and culture*. Equitable intents are visible throughout with various phrases that express this aim: "linguistic capabilities and cultural background are taken into account" (Finnish National Board of Education, 2016b, p. 29), "student's linguistic and cultural identity is supported in a versatile manner" (Finnish National Board of Education, 2016b, p. 29), and "students are guided to understand and respect the right to their own language and culture as protected under the Constitution" (2016b, p. 29). These statements convey the flexibility, support, and respect for various languages and cultures. However, subtleties of other statements in this section indicate the underlying doxa. For example, as in the Basic Education curriculum, a clear hierarchy of language is made apparent. It is noted that Finnish and Swedish are the two primary languages of instruction, which would indicate that these languages possess the greatest cultural capital. "The language of instruction may also be Sámi, Roma or sign language" (Finnish National Board of Education, 2016b, p. 29), and lastly "instruction may also be provided in a language other than the student's native

language referred to above” (Finnish National Board of Education, 2016b, p. 29). Repeated use of the word *may* indicates the presence of stipulations associated with the implementation of these languages and a lack of uniform accessibility. The text then states that, “When the language of instruction is other than Finnish or Swedish, the local curriculum must specify the subjects, scopes and ways in which the language in question is to be used for instruction or study” (Finnish National Board of Education, 2016b, p. 29). First, *when the language of instruction is other than Finnish or Swedish* reiterates the dominance of the two national languages in instruction. Second, the requirement that the local provider *must specify the subjects, scopes and ways in which the language in question is to be used* indicates that instruction in another language is not guaranteed in all capacities; it’s also suggests a degree of control that the curriculum (and culture) is attempting to maintain over the use of this *other* language. *The subjects* in which a student will have access to instruction in their native tongue indicates that there may be content areas where student may not have access to teaching in their language. If instruction is provided in a student’s language for a subject area, then *the scopes and ways* in which the subject is taught in this language may vary. Therefore, even if a content area is taught in a student’s language, the extent to which instruction will be provided and the manner in which the language is applied may vary. Accessibility of a student’s language and their access to each content area may also fluctuate depending upon the local curriculum that is established by the educational provider; this potential fluctuation demonstrates an instance where cultural misalignment can influence a student’s access to and performance in particular content areas, such as mathematics. Finally, the use of the descriptor *language in question* conveys a degree of suspicion or reservation when referring to a language *other than Finnish or Swedish*.

When discussing particular cultures or languages in Finland, other than Finnish or Swedish, the presence of capital is also palpable. The upper secondary schools curriculum notes that “the education for Sámi students must take into account the fact that the Sami people are an indigenous people with their own language and culture” (Finnish National Board of Education, 2016b, p. 29). This statement indicates a degree of capital for Sámi students, and a respect for the Sámi culture. A general respect for the history of the Sámi culture is evident and cognizance that the Sámi people are indigenous to the Finnish land appears to serve as validation for the inclusion of the Sámi language and culture. It is noted that students are supported in developing their identities and participation in the Sámi community, and students are encouraged to pursue studies in the Sámi language in higher education. The curriculum also clarifies that *all* Sámi languages can be provided at the upper secondary level, as noted in the General Upper Secondary Schools Act. With regards to equity, “instruction also supports equal opportunities for studying and participating for Sámi students in both Sámi- and Finnish-speaking communities” (Finnish National Board of Education, 2016b, p. 30). This statement indicates that students instructed in Sámi culminate their education with a degree of cultural capital that supports their equal participation in either a Finnish or Sámi community.

Unlike the Sámi culture and language, the upper secondary schools curriculum immediately establishes the perceived positioning of Roma students within the Finnish society. Almost identically to the basic core curriculum, the upper secondary schools curriculum states that, “the education for Roma students must account for the position of the Roma population in Finland as an ethnic and cultural minority” (Finnish National Board of Education, 2016b, p. 30). This statement identifies the Roma population as a minority within Finnish society and by noting that *the education must account* for this “minority status” the text indicates that Roma students

are not a priority. The General Upper Secondary Schools Act is referenced in this discussion, and the curriculum notes that, “the education promotes the students’ possibilities for both reviving the language as well as Roma-language studies at the higher education institution level” (Finnish National Board of Education, 2016b, p. 30). Use of the word *reviving* suggests a weakened or diminished position that requires renewal, and it is present, not only with regards to the *language* itself, but also with regards the extension of this diminished power at the university level. Together, the two statements above not only demonstrate the diminished capital associated with the Roma language, but in a broader sense, they demonstrate how diminished cultural capital (*the Roma population as an ethnic and cultural minority*) transpires within the educational setting (*students’ possibilities for both reviving the language...*).

While the secondary curriculum discussion of sign language users includes similar wording to that which was noted regarding the Roma language, nuances within the text bare more equitable and inclusive attempts for sign language users. As with the Sámi and Roma languages, the secondary curriculum describes sign language as *their* language, which again indicates a degree of separation from main stream Finnish, communication. However, the curriculum also states an intent for sign language users to develop and “appreciate their own language and culture as equal to the majority language and culture” (Finnish National Board of Education, 2016b, p. 30). While the presence of this statement demonstrates equitable intents for sign language users, the absences of a similar statement when discussing the Roma instruction and culture indicates an elevated status associated with sign language students. Additionally, while sign language is its own language, the two predominant, national languages are still embedded within sign language users’ curriculum through reading and writing content; the curriculum states, “Sign languages or communication methods based on them can also be used

alongside instruction in Finnish or Swedish” (Finnish National Board of Education, 2016b, p. 31). The phrase *alongside instruction in Finnish and Swedish* demonstrates an inclusivity and cooperation amongst the national languages and sign languages that is unique to this language. The curriculum identifies a goal for sign language users to gain an awareness and understanding of the procedures in “hearing people’s culture” (Finnish National Board of Education, 2016b, p. 31) with the intent for sign language users to be able to participate in both contexts. This again denotes a perceived separation amongst the two cultures, but it also reveals a cultural perception that sign language users are considered part of two communities, the Finnish hearing community and the Finnish sign language community. Lastly, the curriculum states, “As both Finnish and Finnish-Swedish sign language are minority languages, special attention must be focused on creating the richest possible sign language learning environment in the education” (Finnish National Board of Education, 2016b, p. 31). Though the curriculum identifies sign language as a *minority language*, as it did for the Roma culture, the use of subsequent phrases, such as *special attention* and *creating the richest possible sign language learning environment*, indicate a determination for equity and access that was not present in the Roma descriptions. When comparing the curriculum’s discussion of Roma language to that of sign language and the Sámi language, the distinctions are clear and may be indicative of the presence of educational capital among these three languages within Finnish education; indirectly, the curriculum’s wording and discussion reveals the capital that is present, and more directly, within this subsection of the curriculum, use of the word *equal* is present in discussion of both the Sámi language and sign language. However, *equal* is not a word that is used when describing the minority, Roma language. Attempts to more fully accommodate sign language and Sámi students may be

indicative of a broader, cultural perception that various *minority languages* require varying degrees of accommodation in education.

Following this description of sign language users, the upper secondary curriculum includes a subsection titled *Foreign-language students*, and it states that, “Common goals and principles laid down in the national core curriculum for upper secondary schools are complied with in the instruction of foreign-language students” (Finnish National Board of Education, 2016b, p. 31). The phrase *common goals and principles* demonstrates attempts to maintain equal expectations for foreign-language students as for Finnish students; yet, the need to explicitly state these common principles and the use of words, such as *complied*, suggests an acquiescence to the legislative mandates, instead of an assumed reiteration of curricular practices. The presence of this statement indicates a need to confirm the inclusion of *foreign-language students* in the common curricular *goals and principles* as opposed to foreign-language students’ inclusion being automatic. This subsection also notes that, “Instruction of the student’s mother tongue may be offered as instruction supplementing general upper secondary education” (Finnish National Board of Education, 2016b, p. 31). The phrase *may be offered* indicates the possibility of instruction in a pupil’s mother tongue, but not the guarantee; the description *as instruction supplementing general upper secondary education* demonstrates the positioning established in the curriculum. By specifying that a foreign-language student’s mother tongue will *supplement* education, the curriculum is ensuring that the Finnish upper secondary education maintains its position as the primary means for learning. Following this, the curriculum states that, “Instruction of the student’s mother tongue may also be provided as the syllabus in mother tongue and literature pursuant to Section 8 of the Upper Secondary Schools Act” (Finnish National Board of Education, 2016b, p. 31). The initial intents of this statement indicate

flexibility and attempts to accommodate students' instruction with access to their mother tongue. However, following this statement, the curriculum then notes that the education provider is responsible for deciding "how the instruction of Finnish or Swedish as a second language and literature, the instruction in the student's language and the instruction of his or her mother tongue are organised and when it is appropriate to implement this" (Finnish National Board of Education, 2016b, p. 31). Unlike the discussion of a student's mother tongue as supplementary instruction, this option to provide students' instruction in their mother tongue is bound by multiple stipulations. First, reference to the Upper Secondary Schools Act demonstrates the influence of Finnish policy and reinforces compliance with Finnish *ways*. The education provider's determination of *how the instruction of Finnish or Swedish as a second language* is organized demonstrates an assumption that instruction in one of the national languages is a mandatory provision to the implementation of a student's mother tongue as the syllabi, and the phrase *when it is appropriate to implement this* presumes a limited implementation of this instructional option. Each of these examples of text highlight how doxa infiltrate even the most accessible and flexible educational practices.

Finally, with regards to language and culture, the secondary curriculum addresses credit transfers in chapter six of the text. Within this discussion of credit transfers, the dominance of the national languages and the *capital* bestowed upon the Finnish and Swedish languages is once again visible. It is noted that, "Credit for courses completed according to the syllabus in Finnish/Swedish as the mother tongue and literature will be transferred in full for courses in Finnish/Swedish as a second language and literature" (Finnish National Board of Education, 2016b, p. 245). However, "Courses in Finnish/Swedish as a second language and literature will be considered equivalent to courses included in the syllabus in Finnish/Swedish as the mother

tongue and literature in so far as their objectives and central contents are equivalent” (Finnish National Board of Education, 2016b, p. 245). These two statements, though similar, in their message of reciprocity in the acceptance of course credits, also convey distinctions. The first statement indicates that courses in Finnish/Swedish as the mother tongue will be accepted *in full for courses in Finnish/Swedish as a second language*; use of the word *in full* conveys an unconditional or unrestricted acceptance of courses in Finnish/Swedish as the mother tongue, and it indicates that high value is placed upon courses in Finnish/Swedish as the mother tongue. However, the transfer of courses in Finnish/Swedish as a second language *to* courses where Finnish/Swedish is the mother tongue is not as automatic and unrestricted. The conditions that courses in Finnish/Swedish as a second language are deemed equivalent *in so far as their objectives and central contents are equivalent* demonstrates the compliance that is entwined in the acceptance of these credits as equivalent; it demonstrates that credits in courses in Finnish/Swedish as a second language can be accepted, but this course equivalence is not assumed. The distinctions in these two statements and their criteria indicate that courses in Finnish/Swedish as the mother tongue are assumed to be at least equivalent to or more highly valued than those where Finnish/Swedish is the second language. It reiterates the capital associated with and assumed in the two national languages and the perceived value place upon the learning in a Finnish/Swedish (as the mother tongue) course versus learning in a course where Finnish/Swedish is secondary.

Bilingual education. Chapter ten of the basic curriculum describes bilingual education, and the chapter opens with a direct statement that Finnish and Swedish are the languages of instruction. It is then specified that in certain instances Sámi, Roma, or sign language may also be the languages of instruction: “The language of instruction in a school is Finnish or Swedish,

and in some cases Sámi, Roma or sign language” (Finnish National Board of Education, 2016a, p. 93). The order of the languages in this message demonstrates the cultural predominance of both Finnish and Swedish over Roma, Sámi, sign language, and any other language within the Finnish education system. Doxa are visible in the wording of the declarative statement that Finnish and Swedish are described as the assumed languages and the phrasing *in some cases* indicates that Sámi, Roma, or sign language are exceptions that are not automatically implemented. The curriculum then states that, “Pursuant to the Basic Education Act, in addition to the actual language of instruction in a school, another language may also be used if it is estimated that this will not risk the pupils’ ability to follow the instruction” (Finnish National Board of Education, 2016a, p. 93). The same sentiment towards the Sámi, Roma, and sign language is conveyed in this statement. When noting the inclusion of another language *in addition to the actual language* suggests two points. First, *in addition* discloses that *another language* would supplement Finnish or Swedish and is considered to be secondary to the two national languages. Second, alluding to Finnish and Swedish as *the actual language* reiterates the capital held by these two languages; *actual* imparts a legitimacy upon these languages that elevates their status above *another language*. This demonstrates a clear instance of power and doxa. The terms *actual* and *other* are used multiple times throughout discussion of the national languages and any alternative language, respectively. The statement above also notes that the *other* language can be used *if it is estimated that this will not risk the pupils’ ability to follow the instruction*. This portion of the statement suggest that the presence of another language could jeopardize instruction and may be indicative of a cultural perception of *other* influences.

The curriculum notes that another language can be implemented, “In a separate teaching group or in a separate school, instruction may be given primarily or fully in some other

language” (Finnish National Board of Education, 2016a, p. 93). Repetition of *separate* emphasizes an intentional partition established between instruction in one of the two national languages and *another language*. The physical separation of students’ instruction creates discrepancies with the location alone; the physical separation indicates a practice that could create exclusion or segregation for students who do not speak a predominant language. This segregation could enhance differences in access and equity; it demonstrates that in order for a students’ language needs to be *primarily or fully* addressed, a compromise must be made with regards to the student’s access to other educational components. This need for compromise may be indicative of a limitation within the educational infrastructure that does not enable a students’ language needs to be *primarily or fully* met in a mainstream context. Within this same chapter of the basic curriculum, cooperation between the school and home is encouraged, and with regards to language, “key documents intended for the guardians must be available in the language of instruction in the school referred to in the Basic Education Act and, as necessary, also in the other language(s) of instruction in the school” (Finnish National Board of Education, 2016a, p. 93). This statement demonstrates equitable intents and a goal to include all families in the educational practices no matter their language; however, the use of the word *key* suggests that not all documents are made available in an individual or family’s first language. Inaccessibility to all information in an individual or family’s first language could amplify social imbalance if guardians are not aware of or able to access all educational documents that other individuals and families can. Additionally, the phrase *as necessary* indicates both an accommodating sentiment but also an obligatory tone. *As necessary* illustrates the doxa that underlies perceptions and positioning related to language in the school setting and in the home.

Based upon the curriculum's discussion of bilingual education, two languages are included in a student's instruction: the language of instruction of the school and a second target/immersion language. The local education provider establishes the "objectives and contents to be set for the immersion/target language locally" (Finnish National Board of Education, 2016a, p. 94). This localized determination of the *objectives and contents* exhibits the potential for significant versatility in each localized language curriculum as the *objectives and contents* are at the crux of instruction and assessment. "In the instruction of the immersion/target language, the pupils' language skills should be developed in a versatile manner, also taking into account the requirements set for language skills by the various subjects" (Finnish National Board of Education, 2016a, p. 94). This statement again notes the flexibility of Finnish curriculum with mention of cultivating students' language skills in *a versatile manner*; however, it also holds implications with regards to equity as it relates to content areas. This statement indicates a cultural recognition that language plays a different role in different content areas; noting consideration of *the requirements set for language skills by various subject*, the curriculum acknowledges that content areas are dependent upon, and influence by, language in different ways and to different degrees. The access (or lack of access) to language in learning may affect different content areas in different ways and to different extents; the influence of language access is culturally recognized (and implied) in the statement above. This belief holds implications with regards to the role of language among content areas, among the locally diverse curricula, and among Finland and other nations. Curricular, and cultural, assumptions are identifiable when it is stated that, "Increasing attention is also paid to correct use of language" (Finnish National Board of Education, 2016a, p. 94). The *correct use* of language exemplifies the doxa present in the curriculum; it embodies the assumed *way* that language is expected to be used, and it also

presumes that language possesses a particular *function* or *role*. The role of language is a culturally determined component that is implicit, and the doxa associated with language, its use, and its place in various content areas demonstrates the potential for capital to originate in a cultural tool, such as language, but manifest inequities in content areas, such as mathematics.

When describing bilingual education, the curriculum notes two approaches: large-scale and small-scale bilingual education. One program within large-scale bilingual education is early total immersion, which begins at an early age and continues through a student's basic education. "Some of the instruction is delivered in the actual language of instruction in the school, and some in the second national language or in the Sámi language" (Finnish National Board of Education, 2016a, p. 95). This statement reveals an instance where the text states one message but its delivery reveals another, underlying perspective. The repeated mention that *some* of the instruction is in the school's instructional language and *some* is in the secondary, national language states that the two languages share the curriculum equally; however, the delivery of this message implies a slightly different sentiment. The use of the word *actual* again indicates a hierarchy among languages, even within an individual school. The national language that is selected as the language of instruction is indicated to have the greatest capital as it is authenticated with its description as the *actual* language. The *second national language* and *Sámi language* appear to hold equal capital among one another as they are both positioned as the peripheral language. Yet, the Sámi language is not included in the categorization of a *national language*, which suggests that it possesses less capital. Without explicitly mentioning Finnish and Swedish, these two languages are understood to be the two *national languages* that are referenced in the discussion of bilingual education; this implicit identity of the two national

languages demonstrates the doxa that are present and the power embedded within their unstated position.

The *immersion language* refers to the second language (not the language of instruction in school). The curriculum notes that a significant amount of instruction is provided in the immersion language: “in early childhood education and pre-primary education, the share of the immersion language is nearly 100%; in grades 1-2, it is some 90%, in grades 3-4 some 70%, and in grades 5-9 on average 50%” (Finnish National Board of Education, 2016a, p. 95). These high percentages are reflective of the cultural emphasis placed upon the adoption of the national languages with the extensive exposure to the languages being built into the curriculum. This emphasis upon instruction in the national languages aligns with another intent that curriculum descriptions—assimilation. The curriculum notes that, “In language immersion education, each national language used in instruction enhances the pupil’s cultural identity” (Finnish National Board of Education, 2016a, p. 95-96). This statement suggests that the *cultural identity* that is being enhanced is the Finnish identity. The curriculum notes that the total immersion program “supports encounters with other languages and cultures” (Finnish National Board of Education, 2016a, p. 96) but the use of the word *encounters* indicates both a brevity and a confrontation with this exposure to *other languages and cultures*. This phrasing exhibits a message of support, but its delivery also reveals a pursued predominance of the national languages in education.

Lastly, the final statement in this subsection related to large-scale bilingual education notes that, “In the planning of the contents, syllabi for Finnish/Swedish that are native-level or intended for immigrants may be used” (Finnish National Board of Education, 2016a, p. 96). This statement creates a division among students by establishing separate syllabi and classifying these documents as *native-level or intended for immigrants*. It reiterates the capital that is assigned to

Finnish and Swedish, and it elevates these two languages above all others. The use of the word *level*, when describing *native-level* students, attaches a higher degree or status to those who are *native*. Additionally, the binary groupings reiterate the dominance of Finnish/Swedish as students either are or are not native and those that are not are all grouped together. These divisive categories compound the cultural capital of *native* students and trickles down to the educational syllabi.

The curriculum then describes other forms of large-scale bilingual education, and it also acknowledges that, “There may also be major differences in the linguistic backgrounds of pupils in large-scale bilingual education” (Finnish National Board of Education, 2016a, p. 96). Recognition of these potential differences in exposure to various languages indicates a positive awareness and consideration of differentiation in students’ learning and instruction. However, shortly after this statement, the curriculum notes that, “Some of the pupils arrive in the school from abroad in such a late stage of basic education that they struggle to study the syllabi in Finnish/Swedish. If it is for some reason not possible to direct these pupils to preparatory education, other support measures are offered” (Finnish National Board of Education, 2016a, p. 96). This quote indicates that those entering the educational system from another country at a later point in their education have diminished power as they *struggle to study the syllabi in Finnish/Swedish*. The phrase *not possible to direct these pupils to preparatory education* then implies that educational opportunities at the preparatory level may be inaccessible; this inaccessibility has the potential to compound students’ already diminished power by amplifying the barrier in students’ access to the syllabi in Finnish/Swedish with the potential omission of preparatory support. Additionally, the wording *if it is for some reason* suggests a degree of ambiguity in the determination as to whether preparatory education is accessible for students

entering the Finnish school system from abroad. Overall, this discussion demonstrates a clear instance where significant misalignment is present among students and the curricular infrastructure. This statement also reveals the curriculum's acknowledgement that language is a barrier that facilitates the manifestation of power dynamics and imbalances in education. The curriculum then states that "some of the subject contents are such that studying them in Finnish or Swedish would be particularly vital in order for the pupil to achieve good capabilities for acting in the Finnish society" (Finnish National Board of Education, 2016a, p. 96). This phrase *good capabilities for acting in Finnish society* explicitly alludes to habitus and notions of power by acknowledging that the Finnish/Swedish languages are perceived form of capital within Finnish society. Additionally, noting that studying *some of the subject contents* in one of the national languages is *particularly vital* indicates that certain content areas may align more fully with various aspects of Finnish society. The implications with such a statement suggest that if a student does not possess capital with regards to one of the national languages then this could hinder their access to and progress with certain content areas.

When discussing *Issues subject to local decisions* in chapter ten of the basic core curriculum, the subsection begins with the following: "If the education provider offers bilingual education in one form or another..." (Finnish National Board of Education, 2016a, p. 97). This statement reiterates the recurring potential for inequities due to discrepancies in accessibility of instruction and/or supports. Use of the word *if* suggests that bilingual education may not be accessible in each school, and the phrase, *in one form or another* indicates that *if* schools do provide bilingual education, then the intensity or form in which it is provided may vary (i.e. total immersion involves a minimum of 50% of instruction in the "other" language while language-enriched education is less than 25% of instruction). As with flexible education, discrepancies in

the admissions process can manifest as the local education provider determines the criteria for admission to bilingual education; the local provider also decides the distributions of lesson hours, the contents that are taught in the language of instruction, and the contents that will be taught in the immersion or target language. Additionally, for large-scale bilingual education, the curriculum decides how, “education for pupils living in Finland for a short time who are unable to study in the language of instruction or the target language” (Finnish National Board of Education, 2016a, p. 97) is organized. Describing the students as those *who are unable to study* alludes to diminished power for these students. This text also conveys resignation with its acceptance that instruction will *not* be fully accessible for *pupils living in Finland for a short time*.

Assessment and Language. As previously noted, the curriculum demonstrates awareness and consideration of students’ individual needs in the assessment process with its acceptance and application of flexible assessment practices. However, with this discussion of flexibility and accommodation, chapter six of the basic core curriculum also cites particular circumstances when assessment aids and services may be applied; in doing so, the curriculum reveals instances where barriers may be present and therefore necessitate aids and services in order to compensate for educational imbalances. Language is one particular intermediary that poses a visible barrier to students: “Even mild learning difficulties and any shortcomings in the pupils’ skills in the language of instruction/Finnish/Swedish should be taken into account when planning and implementing assessment and demonstration situations” (Finnish National Board of Education, 2016a, p. 50). This statement reiterates the predominance of the Finnish and Swedish languages within the culture, and it conveys an acceptance that language can and will create shortcomings for students in the assessment process; this acceptance demonstrates the doxa that are present in

the Finnish culture, in the Finnish educational setting, and in the curriculum. While the curriculum accounts for difficulties and *shortcomings*, this description also demonstrates how the power of the Finnish and Swedish languages is engrained within the assessment process. Subsequent lines within the curriculum's description of the versatile assessment process specifically identify cultural power; "In the assessment of pupils with an immigrant background or pupils who speak a foreign language as their mother tongue, the linguistic background and the developing Finnish or Swedish skills of each pupil are accounted for" (Finnish National Board of Education, 2016a, p. 51). This statement demonstrates equitable intents, but it also pinpoints qualities that are perceived to diminish power and create deficits in students' cultural/educational capital. While *skills of each pupil are accounted for*, this statement also highlights a misalignment in all students' access to instruction with the perception that an immigrant background or a foreign language are assumed to require accommodation in the assessment process.

This perceived disadvantage carries over into the curriculum's discussion of final assessments. Flexibility is noted when the curriculum describes that a numerical, verbal, or combination of both forms of assessment is allowable. One condition is that this flexibility is permissible for grades one to seven, but for eighth and ninth grade a numerical report must be issued. This condition suggests a culturally perceived shift at grade eight or nine that requires the use of numerical assessments. The curriculum notes the advantages of a verbal assessment when it describes that, "a verbal assessment makes it possible to describe not only the pupil's achievement level but also his or her progress, strengths and development targets" (Finnish National Board of Education, 2016a, p. 53). Following this, the curriculum notes that, "excluding the final assessment, verbal assessments may also be used for assessing pupils whose mother

tongue is different from the language of instruction” (Finnish National Board of Education, 2016a, p. 53). While this suggests flexibility and accommodation for individuals whose primary language is not that which they are instructed, it again indicates the presence of a power dynamic among those who do and do not speak a national language. The phrase *whose mother tongue is different from the language of instruction* suggests that this capital is not only present during assessment, but this phrase also reveals that this capital manifests in students’ everyday educational instruction and everyday feedback. Moreover, when examining what is intentionally addressed in this statement, the curriculum notes that while verbal accommodations are made for assessments, they are not applicable on the final assessment; this exception creates a greater disadvantage for students at a culminating point in their educational paths. Lastly, the necessity to accommodate students’ assessments if a different, non-predominant language is not spoken suggests recognition of the presence of inequities in accessibility and participation that warrants reparation.

As previously discussed, distance learning is a mode of flexible learning and instruction that is available in the Finnish education system. When discussing distance learning, the curriculum notes that, “Distance learning may be used especially to support instruction in less common languages and religions and optional subjects” (Finnish National Board of Education, 2016a, p. 41). The use of the word *may* reiterates the notion that distance learning is a possible, but not guaranteed, method of instruction. The statement then identifies instances where distance learning may be used to supplement instruction; by identifying *less common languages and religions* as instances that may warrant supplementary instruction, this statement is suggesting that a deficiency may be present the instruction of students who speak or practice *less common languages and religions*. The phrase *less common* communicates the presence of capital among

various languages and religions in Finland. While specific languages and religions are not noted, this statement signifies the power that doxa infuses within education; though not directly expressed, this statement exhibits the instructional vulnerabilities of students' with *less common languages and religions*. Additionally, if distance learning can be used positively "to complement the instruction and to offer versatile opportunities" (Finnish National Board of Education, 2016a, p. 41), then the flexibility and autonomy bestowed upon educational providers to determine *if* distance learning is offered in their school(s) may have a greater impact upon students who speak or practice *less common languages and religions*. The possibility that distance learning may not be offered in the school where a student with a *less common languages and religions* attends has the potential to amplify deficiencies in instruction and magnify the inequitable access to learning opportunities.

When discussing assessment, the upper secondary schools curriculum describes the allowance of alternate modes of assessment and demonstration of comprehension. However, the curriculum notes this by stating, "Diagnosed impairments or comparable difficulties, such as dyslexia, immigrant students' linguistic difficulties, and other reasons which complicate demonstration" (Finnish National Board of Education, 2016b, p. 241) are considered and accommodated through alternate assessment modes. The description above groups *diagnosed impairments* and *immigrant students* together when the curriculum notes these *comparable difficulties*. The text's explicit, and repeated, use of the word *difficulties* demonstrates the diminished power inhibiting immigrant students. Additionally, phrases such as *comparable difficulties* and *reasons which complicate demonstration* suggest the curriculum's acknowledgement of barriers in the assessment process. The curriculum is accommodating, yet

the root of the implementation of accommodations also reveals the presence of imbalances, which warrant these adaptations.

Gender. As previously discussed the basic core curriculum references the Act on Equality between Women and Men. While the description of the Act on Equality between Women and Men is indicative of equitable intents, the description of the act may reveal current or former power dynamics among genders. The curriculum states that with the Act on Equality between Women and Men “women and men have equal opportunities” (Finnish National Board of Education, 2016a, 14). The distinct sequencing that mentions women before men demonstrates an intent to ensure equality among genders, but it also signifies a degree of compensation and reveals that women are perceived to be in jeopardy of marginalization. This sequencing is one of the few instances in the curriculum in which the female noun or pronoun is used before the male noun or pronoun; in most sentences of the curriculum, the male pronoun precedes the female pronoun, i.e. *his or her*, *himself or herself*, and *him or her*. This recurring pattern is indicative of doxa, and an assumed convention of both written and spoken text, where the female pronoun is generally stated after the male pronoun. These few instances where female nouns or pronouns precede, it is usually within direct discussions or declarations of gender equality where there may be a heightened awareness of power dynamics. Therefore, this normed sequencing of gender pronouns, where *his* precedes *hers*, etc. indicates a subtle, but assumed, style of text that is subconsciously accepted and applied in the curriculum. This sequencing reveals the potential of underlying power among genders, the mention (and development) of the Act on Equality between Women and Men is also indicative of reaction to a prior or currently recognized imbalance among genders.

Another instance in which *girls* are mentioned before *boys* occurs in chapter three, when there is an explicit discussion of promoting gender equality in education following a discussion of human and social capital; the curriculum states that, “The mission of basic education is to prevent inequality and exclusion and to promote gender equality. Basic education encourages girls and boys to study different subjects equally and promotes information and understanding of the diversity of gender” (Finnish National Board of Education, 2016a, p. 19). In these statements, the basic core curriculum begins with a broad statement about the prevention of *inequality and exclusion*, but then it hones in upon gender equality. Specific mention of gender equality may simply be indicative of the culture’s cognizance of maintaining equality among genders; however, it may also signify prior or current imbalances among genders. The positioning of this statement immediately following one that identifies that, “the social task of basic education is to promote equity, equality and justice” (Finnish National Board of Education, 2016a, p. 19), and after the curriculum’s recognition of the role of capital, may be signify awareness of the presence of capital among genders in education. Noting that the curriculum *encourages girls and boys to study different subjects equally* suggests that particular content areas may have been dominated by a particular gender. The presence of gender roles or gender associations is also visible when discussing working methods in chapter four of the basic core curriculum. As previously cited in discussion of the curriculum’s equitable intents, it states that, “In the selection of working methods, attention is also paid to recognising and modifying gendered attitudes and practices” (Finnish National Board of Education, 2016a, p. 31). While this statement does indicate intentions to diminish the influence of gender in students’ choices and attempts to shift a mindset that is engrained in learning practices, it also acknowledges the presence of a gendered mindset and gendered practices. This statement identifies doxa that are embedded within educational

attitudes and practices and have the potential to impact students' participation. When discussing guidance counseling supports, chapter fifteen of the basic curriculum notes that, "pupils are encouraged to reflect on their preconceptions related to education and professions and to challenge them as well as to make choices without gender-related role models" (Finnish National Board of Education, 2016a, p. 298). While this statement encourages students to counter *preconceptions related to education and professions*, it also recognizes the presence of gender associations and perceptions within Finnish education and within the Finnish culture that extend beyond students' academic careers and into their professional careers. Within this discussion of culturally established gender association, gender bias and/or gender presumptions, the text does not reveal one particular gender as possessing greater capital; however, it does reveal how doxa can infiltrate and influence students' perceptions and educational pursuits.

Within the basic curriculum, references to *gender roles and gender-related role models* are recurring throughout the text. In chapter fifteen when discussing seventh to ninth graders the curriculum encourages students, "to make reasoned choices regarding studies and work from their own starting points while being conscious of the impact of traditional gender roles and other role models" (Finnish National Board of Education, 2016a, p. 305). This statement alludes to historical gender roles and cautions students about *the impact* that these doxa have had and the potential influence that traditional roles may continue to have.

Within chapter five of the general upper secondary school curriculum, equitable intents related to gender are visible: "Understanding gender and sexual diversity creates preconditions for gender and equality conscious instruction" (2016b, p. 35). This statement indicates social awareness and attempts to provide equitable instruction, but it also indicates areas of focus where equity is perceived to be in jeopardy and must be obtained or sustained. Based on this statement,

gender and gender identity are two areas of focus for the curriculum. This heightened awareness related to gender equality is also visible in the consistent mention of *gender equality*. This phrase is frequently referenced where equity and equality are being discussed, and this pattern is visible throughout various chapters of the basic core curriculum. For example, in chapter four of the basic curriculum, in a subsection titled *Equity and equality*, it is noted that, “A learning community promotes gender equality by its values and practices” (Finnish National Board of Education, 2016a, p. 30). In the context surrounding this subsection, the discussion is centered around equal treatment for all members of a community and “safeguarding everybody’s fundamental rights and opportunities” (Finnish National Board of Education, 2016a, p. 30). In this context, reference to gender equality fits; however, within this *Equity and equality* subsection, gender is the only demographic identifier that is specifically referenced with regards to equality. While this reference to and discussion of gender equality demonstrates obvious intentions for gender equality, it also highlights a perceived necessity to explicitly convey this message; this overt discussion of gender equality suggests that it is not an inherent societal practice and instead necessitates monitoring and enforcement of equal education practices. The need for reiteration of gender equality is also visible in chapters thirteen, fourteen, and fifteen when discussing students’ mother tongue and literature. At various grade level intervals (grades 1-2, grades 3-6, and grades 7-9), the text repeats the following statement, “Each pupil’s uniqueness, equity, and gender equality are taken into account in the instruction, learning environments, and teaching methods” (Finnish National Board of Education, 2016a, p. 110-111, p. 171, p. 308). Similarly, in chapter thirteen, fourteen, and fifteen when discussing students’ mother tongue and literature curriculum another statement that is restated is that, “Texts and working methods are selected to ensure the equity and gender equality among the pupils”

(Finnish National Board of Education, 2016a, p. 111, p. 172, and p. 309). Again, while these repeated statements are indicative of efforts to enforce gender equality, their reiteration suggests that they are not yet engrained within educational mindsets and learning practices.

This notion is confirmed in the upper secondary curriculum when it states that, “attention is paid to recognising and changing gendered attitudes and practices” (Finnish National Board of Education, 2016b, p. 14). The phrase *attention paid* demonstrates equitable attempts; however, the use of *recognising and changing* acknowledges the presences of gendered perceptions. Additionally, *gendered attitudes* indicates that gender-related ideas infiltrate both ways of thinking and ways of being. As with the basic core curriculum, within chapter five of the secondary curriculum, repetition of sentences surrounding *gender equality* are used. For example, in chapter five, when discussing the Swedish language, the Finnish language, and foreign-languages respectively, the curriculum states, “Language learning and language choices strengthen gender equality by encouraging the students to be open-minded and dealing with different topics in a versatile manner” (Finnish National Board of Education, 2016b, p. 93, p. 104, and p. 114). The recurring use of this statement signifies that it is a curricular emphasis. It also reveals a cultural perception that language and gender equality are strongly linked to one another, as the use of a recurring statement in the basic core curriculum was also associated with students’ mother tongue and literature. Within this statement, in particular, the use of the word *strengthen* discloses attempts to improve gender equality; this aspiration to improve gender equality demonstrates reflection and progressive perspective, but it also indicates a deficiency in the present state of conditions related to gender equality. As with the basic core curriculum, the text consistently alludes to gender equality, which it declares equitable intents but reveals inadequacies related to gender equality. Additionally, with these statements related to gender

equality, neither the basic core curriculum, nor the upper secondary curriculum, denote one gender as possessing greater capital; instead references to gender equality simply suggest the presence of capital and acknowledge how doxa related to gender infiltrate cultural and educational attitudes and practices.

While the curriculum demonstrates the influence of existent doxa, chapter five of the secondary curriculum also exhibits Finnish efforts to reconcile these doxa and shift inequitable perspectives that can manifest in students' instruction; when addressing students' development of their identity, the text notes that, "Understanding gender and sexual diversity creates preconditions for gender and equality conscious instruction" (Finnish National Board of Education, 2016b, p. 35). Again, this statement demonstrates efforts to remediate gender-related inequities in students' learning through *understanding*. The use of *understanding* paired with the phrase *equality conscious instruction* indicates a cultural recognition that inequitable practices stem from unconscious beliefs that surface through subtleties in students' instruction.

PISA and OECD

PISA 2012. When examining trends within the 2012 PISA results, Finland stands apart from other nations with regards to gender and mathematics performance with girls outperforming boys in this content area. Additionally, on the 2012 PISA, Finland fell in line with another trend with girls outperforming boys in reading, which was the outcome for all nations that participated in this administration of the PISA. While Finnish girls' performance is a positive and successful shift towards gender equality in academics, concerns are not arising with regards to boys' academic performance. The OECD notes that internationally when participating PISA students were asked to consider what they anticipated for both their academic and employment future, "girls hold more ambitious education and occupational expectations than boys" (OECD, 2015, p.

24) With this finding, the OECD continues by warning that, “What these results imply is that, in the shadow of the progress that has been made in both education and employment over the past century, other problems are festering” (OECD, 2015, p. 24). This statement acknowledges the positive progress has been made towards gender equality for women; however, it seems to be cautioning that a different form of gender inequality, one that is detrimental to male students, may be manifesting. The OECD notes that Finland is among one of six nations where “the proportions of young women who graduated from upper secondary pre-vocational and vocational programmes were at least 5 percentage points larger than the proportions of men” (OECD, 2015, p. 24). This demonstrates positive progress in women’s participation in a previously male dominated realm of educational training.

While this is a positive trend, it does not extend to all employment fields. The OECD notes that despite girls’ high performance the PISA, particular academic degrees and career fields remain predominantly male. Among the OECD countries, “women were awarded only a small proportion of university degrees in the fields of manufacturing and construction (28%) and computing (20%) (OECD, 2015, p. 27). The OECD identified five nations where at least a third of the individuals were female, however, Finland was not among these five nations.

Additionally, the OECD alludes to a European Union initiative from 2000, which intended to increase females’ participation in the academic areas of math, science, and technology at the university level. However, this initiative has produced little change, and only five OECD countries have seen that “the proportion of women in the broad field of science (which includes life science, physical sciences, mathematics and statistics, and computing) grew by at least 10 percentage points between 2002 and 2012” (OECD, 2015, p. 27). Finland was again absent from this list of five nations that achieved this percentage increase. Therefore, though Finland’s PISA

performance has demonstrated success in promoting girls' academic achievement, this high performance does not necessarily translate into their continued participation in mathematics and science related-fields at the university level and beyond. This trend suggests that while gender equality initiatives are addressing equal access to and performance at the elementary and secondary levels of education, a power imbalance still remains and is contributing to discrepancies in female participation in mathematics and science related-fields at the university and beyond.

PISA 2015. As with the results of 2012 administration, Finland was among one of nine countries where “girls score higher than boys in mathematics, on average” (OECD, 2016, p. 196), and when highlighting the *Change between 2012 and 2015 in gender differences in mathematics performance*, an OECD figure demonstrates that the gender differences are increasing; in both 2012 and 2015 PISAs, Finnish girls scored higher than Finnish boys in mathematics, and the data indicates that the score-point difference increased from 2012 to 2015. With a focus on science in the 2015 administration of the PISA, the OECD's analysis indicates that with regards to science performance, “Finland is the only country in which girls are more likely to be top performers than boys” (OECD, 2016, p. 4) Additionally, though Finland's mean average for collaborative problem solving was above the OECD average, ranking 7th in this domain of assessment, performance differences were present when comparing genders. In the PISA's assessment of collaborative problem solving, Finland was among one of five countries with over a forty-point gender discrepancy in favor girls: girls obtained a mean score of 559 and boys obtained a mean score of 511 (OECD, 2016, p. 25). With regards to reading, Finland's scores indicated a 47-point difference which is described as “among the largest gender gaps of all participating countries” (OECD, 2016, p. 170). This gender discrepancy across all four

content areas is potentially indicative of a somewhat unexpected imbalance in educational access. Not only is this a recurring, and widening, trend in mathematics scores between 2012 and 2015, but the significant discrepancies in scoring among genders across other domains, particularly collaborative problem solving and reading, may signify a barrier in educational access for Finnish boys.

Another area of concern relates to immigrant students in Finland. The 2015 administration indicates that, “The difference in the percentage of low performers in mathematics between students with an immigrant background and those without an immigrant background is one of the highest among PISA-participating countries and economies (OECD, 2017b, p. 5). When reviewing the overall performance of Finland on the PISA 2015, and comparing the nation to a prior 2006 administration, the nation’s equity related to students’ social status was above the OECD average and has remained stable over the last nine years. However, with regards to immigrant students, Finland’s equity remains below the OECD, and the data also indicates that this below-average equity performance for immigrant students has remained fairly stable since 2006; this stability suggests that inequities related to immigrant students have been present for the past nine years, and these sustained inequity indicates a stagnancy in the educational and social infrastructures of Finland as it pertains to providing immigrant students with equal access to and equal participation and performance in academic contexts (OECD, n.d.).

Education Policy

Finnish education-related acts and decrees. While the Basic Education Act (1998) demonstrates clear intents for equity in education, some statements in this legislative act reveal the presence of doxa and underlying imbalances. When describing the arrangements for basic

education, the text states that, “The local authority shall have an obligation to arrange for basic education for children of compulsory school age residing in its area” (Ministry of Justice, 1998, p. 2). Initially, this statement presents simply as a description of ensuring that students are able to participate in education by noting the local provider’s *obligation to arrange for basic education*. However, other details in this statement demonstrate the limitation of this statement; by specifying that this education is *for children of compulsory school age residing in its area*, the text is providing two stipulations for individuals’ participation. First, students must fall within a particular age range in order to be guaranteed participation; while later sections of the Act provide exemptions from this age limitation, participation is not automatic if an individual is outside of this criterion. Additionally, education is obligatory for students’ *residing in its area*. This provision indirectly restricts education to residents, which mandates a particular social and economic status for inclusion; this phrase also raises questions as to whether refugee children, and children who are not citizens of Finland, have access to educational opportunities. When discussing the *Duration of education*, the Act states, “The extent of instruction preparing immigrants for basic education shall correspond to a one-year syllabus” (Ministry of Justice, 1998, p. 4). While this statement indicates attempts to prepare *immigrants for basic education*, it also lacks the flexibility and accommodations that are characteristic of much of Finnish education. This statement demonstrates that the supports leading up to immigrants’ participation in basic education are limited to *a one-year syllabus*. A time restriction, such as this, demonstrates the absence of both flexibility and the assurance that the student is obtaining the *appropriate* and *individualized* supports that are frequently alluded to in legislation and in the curriculum. This distinction in the preparations and supports for immigrant students suggests that systematic supports for immigrants are not yet sufficiently established. Residence is again

distinguished as a form of capital in education when the legislation notes that, “the local authority may decide to give precedence to children residing in its area in admission to education provided by it” (Ministry of Justice, 1998, p. 13). This statement demonstrates the potential advantage that a particular residence can provide to a student’s acceptance into a school. By allowing residence to be a basis for admission to an educational entity, the legislation is presenting social and economic capital as a normed criterion for academic admittance, which creates or reinforces power and imbalances,

Discussion of language, and doxa surrounding this, are also evident in the Basic Education Act (1998). As with the curricula texts, a hierarchy of languages is also evident in this legislation when it states, “The language of instruction and the language used in extracurricular teaching shall be either Finnish or Swedish. The language of instruction may also be Sámi, Roma or sign language” (Ministry of Justice, 1998, p. 4). This statement highlights the power and the capital that is assigned to the two national languages, Finnish and Swedish. Not only is the implementation of these two languages required as the language of instruction, but the legislation also declares that Finnish or Swedish be *the language used in extracurricular teaching*. This demonstrates the dominance of these two languages over *Sámi, Roma or sign language*, and it demonstrates the prevalence of these two languages in systematically, and more specifically, in students’ everyday learning. The hierarchy of languages is further delineated within a section titled *Mother tongue*. In this section the Basic Education Act (1998) first states that, “As mother tongue the pupil shall be taught Finnish, Swedish, or Sámi” (Ministry of Justice, 1998, p. 6), and subsequently, “As mother tongue, the pupil may also be taught the Roma language, sign language or some other language” (Ministry of Justice, 1998, p. 5). The initial mention of *Finnish, Swedish, or Sámi* and their pairing with the phrase *shall be taught* indicates that these

three languages are prioritized and guaranteed in students' instruction. The secondary mention of the *Roma language, sign language or some other language* and their pairing with the phrase *may also be used* demonstrates the possibility of the implementation of these languages, but it suggests that their use is not guaranteed. This distinction in word choice and the sequencing of the languages reveals the power and capital that is embedded within various languages.

The Finnish National Board of Education Decree (2008) reveals further distinctions in the power of each language. Within the Basic Education Act (1998) and within both the basic core curriculum and the upper secondary schools curriculum, the Finnish and Swedish have been presented as possessing the same degree of power and were generally grouped together as the two national languages; however, the Finnish National Board of Education Decree reveals a division that assigns the Finnish language greater power. In section two of the decree, when discussing the organisation the document notes that, "There are departments in the National Board of Education for general education, vocational education, information and evaluation services, services for the education sector and education in Swedish" (Ministry of Justice, 2008, p. 1). The establishment of a department for education in Swedish is also mentioned in section four of the Finnish National Board of Education Act; in this act, the document states that, departments in the National Board of Education are specific duties. "However, there is always one department for duties related to education in Swedish" (Ministry of Justice, 1991, p. 1). By noting that there is a particular department dedicated to *education in Swedish*, these documents reveal that Swedish is not assumed to be one of the languages of education. The inclusion of this department for *education in Swedish* is indicative that Swedish is a prioritized language; however, unlike the Finnish language, inclusion of these departments suggests that there is not an automaticity with the implementation of the Swedish language. Additionally, when describing

the required qualifications for public officials' participation, the Finnish National Board of Education Decree states that, "public officials in the department for education in Swedish shall have, besides statutory competence in Finnish, a level of competence in Swedish" (Ministry of Justice, 2008, p. 3). This statement reiterates the presence of doxa when it assumed acquisition of the Finnish language the phrase *besides statutory competence in Finnish*. This wording suggests a presumption that Finnish is to be acquired and the descriptor *statutory* to describes individuals' expected *competence* inserts a legal facet in the expected proficiency of the Finnish language.

Lastly, when discussing the appointment of board members, the decree reveals potential exclusions that can manifest with established language barriers; "When appointing the board of directors, representatives of both official language groups shall be taken into account" (Ministry of Justice, 2008, p. 2). While this diminishes power dynamics among the Finnish and Swedish languages by alluding to each as *both official language groups*, the document is also revealing that these two language groups are the only groups that *shall be taken into account*. This language restriction demonstrates a significance instance of exclusion for individuals who do not practice Finnish or Swedish as their primary language; in this instance, language presents as a barrier to individuals' participation in decision making and processes related to the establishment and enforcement of educational practices. Additionally, appointees will not include representatives who speak a language other than Finnish and Swedish, which allows the capital assigned to the Finnish and Swedish languages to infiltrate educational policy, educational curriculum, and potentially educational practices.

Cultural influences in education and mathematics. On the second page of the twenty-eight-page brochure, *Finnish Education in a Nutshell* (2017), a single quote is displayed with an image of a pencil and graph paper in the background; the quote states, "A central objective is to

provide all citizens with equal opportunities” (Finnish National Agency for Education, 2017, p. 2). Presenting this quote as the first statement in the brochure emphasizing *equal opportunities* as a paramount focus. However, as with the curriculum, the specification that these *equal opportunities* are to be provided for *all citizens* indicates a bound within which these equal opportunities are embraced by the Finnish culture. Use of the word *citizens* as opposed to *individuals* or *human beings* raises questions as to whether these *equal opportunities* are afforded to individuals, such as refugees or immigrants, whose citizenship may be more ambiguous.

Additionally, within *Finnish Education in a Nutshell* (2017), the first section, *Equity in Education*, includes one subsection entitled, *Efforts are made for supporting language minorities and migrants* (Finnish National Agency for Education, 2017, p. 8). The title of this subsection immediately identifies two groups, *language minorities* and *migrants*, that the Finnish culture perceives to possess imbalances in power when it notes intents *for supporting* these two groups of individuals. However, the first line of this subsection, which states that, “Finland has two official languages, Finnish and Swedish”, is somewhat contradictory to its title’s intents and this statement exemplifies the power imbalance that is present. This power is alluded to once again with the brochure notes that, “Both language groups have their own institutions also at higher education” (Finnish National Agency for Education, 2017, p. 8). The juxta positioning of this latter statement with a series of subsequent statements, provides a stark contrast that accentuates the power imbalances in education with regards to language. The brochure notes, “there are educational institutions where all or at least some instruction is provided in a foreign language”, “education providers can, for example, apply for additional funding for organising instruction in Roma and Sami languages as well as for instruction in the migrant pupil’s mother tongue” (Finnish National Agency for Education, 2017, p. 8), etc. While the first statement ensures that

the two national languages extend all the way through to students *higher education*, the subsequent series of statements does not even guarantee that students can receive all of their educational instruction in their language; the brochure then presents the possibility of applying *for additional funding* as a positive feature; however mention of this process demonstrates that the additional funding is not guaranteed when it references that educational providers *can apply*. This statement also conveys a dismissive quality by grouping all individuals who do not speak one of the national languages together when it presents this uncertain funding as a solution for *Roma and Sami languages as well as for instruction in the migrant pupil's mother tongue*.

Research Question 2

Question 2: What habitus is being promoted for teachers and students?

(a) How are these procedures and practices linked to different kinds of habitus?

Below, *Figure 3* highlights Finnish educational practices are procedures that embody the habitus of the broader Finnish educational, mathematics, and cultural fields. Social consciousness, cognizance of the physical and cultural environment, and cooperation, collaboration, and peace are components that were consistently identified in the present analysis.



Figure 3. Educational Practices and Procedures

Practices and Procedures

The first section of chapter four of the basic core curriculum reveals the values within the Finnish society, including equity, cooperation, respect, goal-setting, and trust. The curriculum also provides insight into a cultural perspective as to how educational entities interact when it states that, “the culture of a community comprises its practices that are shaped by its history and culture” (Finnish National Board of Education, 2016a, p. 27). This description of *the culture of the community* alludes to doxa that *comprises its practices* or influences its habitus; this statement also recognizes the presence of *history and culture* within an educational context. Following this, the curriculum notes that, “The school culture is shaped by both conscious and unconscious factors. The school culture affects those who are within its sphere, regardless of whether its significance and impacts are recognised or not” (Finnish National Board of Education, 2016a, p. 27). In this instance, the curriculum reiterates the doxa that infiltrate *those who are within its sphere*, or those who exist within a particular field; the phrases *conscious or unconscious* and *recognised or not* indicate an awareness of the subtle, understood, and at times, indecipherable nature of these doxa that affect one’s habitus. The curriculum continues when it notes that, “The clearest manifestations of the school culture are found in the community’s practices” (Finnish National Board of Education, 2016a, p. 27). This statement suggests that the embodiment, or habitus, of an educational or school culture is discernible through the ways of being to the practices that are carried out.

Social Consciousness

Social responsibility is a tangible characteristic woven throughout the basic core curriculum. This collectivist perspective appears in discussion of other individuals, the local community, the international community and the environment. Within chapter two, the basic

core curriculum states that, “Each pupil has the right to grow into his or her full potential as a human being and a member of society” (Finnish National Board of Education, 2016a, p. 15). The use of the phrase *human being* serves as a reminder of students’ humanity and indicates the curriculum’s cognizance that students’ *being* extends beyond the classroom to encompass, not only their own growth and potential as a student, but also their presence within a broader context as *a member of society*. Throughout the curriculum, the term *human being* coincides with the word *growth*. This pairing signifies not only individual *growth*, but also a perception that *growth* contributes to a broader network. For example, the curriculum includes the following statements: “Basic education supports the pupil’s growth as a human being who strives for truth, goodness, beauty, justice and peace” (Finnish National Board of Education, 2016a, p. 16), “Learning is an inseparable part of an individual’s growth as a human being and the building of a decent life for the community” (Finnish National Board of Education, 2016a, p. 17), and “Supporting the pupils’ growth as human beings and into ethically responsible members of society is a central goal” (Finnish National Board of Education, 2016a, p. 20). In each of these instances an individual’s growth as a *human being* is perceived as participating in and affecting the surrounding community or society. This habitus, or this way of thinking and interacting, demonstrates how societal features underscore perceptions of *what* education is and *how* (practices and procedures) it is implemented. The curriculum notes that, “Education promotes participation, a sustainable way of living and growth as a member of a democratic society” (Finnish National Board of Education, 2016a, p. 19). The recurring notions of personal development, democratic ideals, and a sustainable living align with the emphasis upon students’ humanness and demonstrate how educational practices emphasize social consciousness.

This same attention to social consciousness is evident in the upper secondary curriculum. Within chapter five's discussion of the educational objectives; the curriculum states, "The objectives emphasise the importance of transversal general knowledge and ability and understanding entities, and encourage the student towards ethically responsible and active agency at the local, national, and international level" (Finnish National Board of Education, 2016b, p. 34). Noting *the importance of transversal general knowledge and ability* demonstrates an emphasis upon the extension of students' knowledge and capabilities into other contexts; reference to *understanding entities* indicates an intention for students to gain insight into systematic and organizational structures, which signifies a cognizance of social processes and dynamics. Mention of *ethically responsible and active agency* directly identifies the moral components for which the curriculum strives. Use of *responsible* demonstrates awareness of an obligation to others and *active agency* petitions students' involved participation.

The Environment

The curriculum cites various practices and procedures that are encouraged within the core curriculum to promote growth and social consciousness. These processes extend consideration beyond interactions with others to also consider the greater context in which these interactions occur, the environment. When discussing *the conception of learning* in a subsection of chapter two, the basic curriculum states, that "pupils are also guided to take into account the consequences and impacts of their actions on other people and the environment" (Finnish National Board of Education, 2016a, p. 17). The phrase *take into account the consequences and impacts* demonstrates a cultural mindset of social responsibility. Noting that students are *guided to* this mindset indicates that this perspective is embedded in the instruction. A similar statement in the upper secondary curriculum notes that, "education reinforces the student's awareness of

the impacts of human activities on the state of the environment” (Finnish National Board of Education, 2016b, p. 34). The phrase *impacts of human activity*, not only conveys a concern for the environment but, use of the word *impacts* also reveals the curriculum’s recognition of the interconnectedness of social and ecological systems. *Within* chapter three, the basic core curriculum states, “The pupils understand the significance of protecting the environment through their personal relationship with nature” (Finnish National Board of Education, 2016a, p. 25). The reference to *their personal relationship* conveys an intention to incorporate a degree of individual accountability, and the phrase *pupils understand the significance of protecting the environment* exemplifies the transference of a cultural and social habitus to education perspectives and processes. In a subsection of chapter four titled, *Environmental responsibility and sustainable future orientation* (2016a, p. 30), the curriculum notes its commitment to the environment in its daily practices and procedures when it states that, “Material choices and operating methods that waste raw materials, energy and biodiversity are replaced by sustainable ones” (Finnish National Board of Education, 2016a, p. 30). This statement suggests that not only are students expected to exhibit social and environmental responsibility but there is also an expectation of systematic accountability. This emphasis upon moral and collective conceptions infiltrate three overarching concepts fostered in the planning of procedures and instructional practices of the curriculum. The first involves the establishment and maintenance of a cooperative, collaborative and peaceful learning environment. The second integral theme within the curriculum is the promotion of multiple perspectives and learning approaches. Lastly, reflective practices and procedures are integrated throughout the curriculum with the intent of facilitating educational progression and evolution; this latter focus aligns with notions of lifelong learning and growth.

As previously defined, “Habitus operates at various levels—in one’s thoughts, actions, use of language, and in how one embodies experiences of structures and relations” (Nolan, 2012, p. 204). Several themes emerged within the practices and procedures that are promoted within the curriculum, and each of these themes are indicative of, and aligned with, the habitus that is evident through the educational curriculum. Among the themes that emerged in the curricular practices and procedures, an interconnectedness and coherence was also evident.

Cooperative, Collaborative and Peaceful Learning Environment

Cooperation. Cooperation is a theme that is both explicitly discussed and implicitly assumed within the basic core curriculum. Within the first chapter of the core curriculum, the word *cooperation* is directly mentioned over twenty times. Cooperation is identified in the planning processes of education. The curriculum notes that, “Cooperation in the preparation of the curriculum and annual plan promotes commitment to shared goals and the coherence of instruction and education” (Finnish National Board of Education, 2016a, p. 10). This statement reveals that cooperation is perceived to facilitate a consistent and comprehensive practices in the development of curriculum. The curriculum strives for this cooperation to extend “between home and school” (Finnish National Board of Education, 2016a, p. 9), among educational providers, “between subjects” (Finnish National Board of Education, 2016a, p. 10), “with other administrative branches” (Finnish National Board of Education, 2016a, p. 11), and “with other organisations and various experts” (Finnish National Board of Education, 2016a, p. 11). This inclusion of various actors demonstrates a multifaceted approach to collaboration and a recognition that educational practices extend beyond the school setting into societal and political realms. Not only is the expanse of cooperation described in relation to the actors and entities involved in education, but it is also discussed within the context of educational processes and

practices. This perception is reiterated in chapter four of the basic curriculum when the curriculum states, “Decisions are made locally on how the pupils and guardians may take part in the development of the school culture, what other types of cooperation the school may engage in, and which actors the other cooperation may take place with” (Finnish National Board of Education, 2016a, p. 34). The phrase *how the pupils and guardians may take part* signifies efforts for a collaborative relationship with those developing curriculum, including parents and students. The cooperation that *the school may engage in* indicates that cooperation is an action and an embodiment of the collaborative mindset embedded within the culture. Lastly, consideration of *which actors the cooperation may take place with* indicates an element of choice or selection that suggests that cooperation is an intentional approach or practice within the curriculum.

Within chapter five of the basic core curriculum, the second section is titled *Cooperation*. The inclusion of a section with this title signifies that integral role that *cooperation* is perceived to have within education, and the curriculum states that, “Cooperation is also needed to safeguard the diversity and safety of learning environments and the well-being of the school community” (Finnish National Board of Education, 2016a, p. 37). Describing *cooperation* as that which *is also needed to safeguard the diversity and safety of a learning environment* indicates that cooperation is an entity that is present within the learning environment and contributes to its essence or *way* of operating. The three, subsequent subsections in this section reveal the practices that manifest from this embedded cooperation. The first subsection, *Pupils’ participation*, notes that, “The school ensures that the pupils gain experiences of cooperation and democratic action in their own teaching group, the school and its local environment and various networks” (Finnish National Board of Education, 2016a, p. 37). Noting that students *gain experiences of cooperation*

and democratic action indicates that instructional practices promote collaboration and cooperation. Additionally, noting that this experience extends to *their own teaching group, the school and its local environment and various networks* suggests that instructional practices also promote students' transference of cooperative practices beyond the classroom setting and promote students' participation in collaborations within their broader environment, and this latter point arises again in the third subsection. Within the mathematics curriculum, the text notes that, "It also develops their communication, interaction, and cooperation skills" (Finnish National Board of Education, 2016a, p. 136, 252, 402). This statement recognizes the interactive and collaborative nature of mathematics with mention of each of the three skills: *communication, interaction, and cooperation*. The second subsection, *Cooperation between home and school*, addresses the bidirectional nature of cooperation among schools and the home. While the curriculum notes that "Under the Basic Education Act, the schools must cooperate with the pupils' homes" (Finnish National Board of Education, 2016a, p. 37), the curriculum then states that guardians "must also ensure that the pupil completes his or her compulsory education (Finnish National Board of Education, 2016a, p. 37). Each of these statements demonstrates a degree of accountability that both the school and the home possess in the cooperative education of a student. With regards to cooperation, "Trust, equality and mutual respect" (Finnish National Board of Education, 2016a, p. 38) are identified as the foundation for cooperation. These values are indicative of the curriculum's approach to parent/guardian participation. Additionally, the curriculum acknowledges that the, "diversity of families and their needs for information and support are taken into consideration" (Finnish National Board of Education, 2016a, p. 38). This statement, and subsequent descriptions, demonstrate cognizance of diversity, which manifests through the implementation of flexible practices, such as providing various modes of

communication in order to meet family's needs and foster communication and cooperation. Cooperation among the school and home is perceived as contributing to a student's growth and development, but the curriculum also demonstrates that cooperation between home and school also contributes to the larger community: "Networking and the parents' joint activities enhance community spirit and support the work of the teachers and the school" (Finnish National Board of Education, 2016a, p. 38). *Networking and parents' joint activities* indicates that the collaborative nature of parents' involvement is perceived to extend beyond cooperation with the school to include cooperation with other parents and other entities interconnected with education. Additionally, use of the word *enhance* indicates the positive perception associated with parents' involvement that is perceived as a contribution. The phrases *community spirit* and *the work of the teachers and the school* shows how parents cooperation with the school extends to various actors and entities associated with education and learning. Lastly, use of the word *parents'* as opposed to *guardians* or *the home* presumes a particular home or family dynamic and is somewhat contradictory with the curriculum's prior statement related to acknowledgement of "the diversity of families and their needs" (2016a, p. 38). Use of the word *parents'* may be indicative of a particular habitus that infiltrates social interactions and is reflective of assumed social constructs. This use of language has the potential to create misalignments among the assumed manner. The upper secondary curriculum demonstrates attempts to establish a sense of community when it states that, "Upper secondary school education contributes to togetherness, participation and well-being by strengthening interaction, cooperation, and expression skills" (Finnish National Board of Education, 2016b, p. 34). In this statement, use of the phrase *contributes to* demonstrates that *education* is perceived to be an entity that facilitates cooperation and fosters students' *togetherness, participation and well-being*. The phrase *by strengthening* indicates a

presumption that *interaction, cooperation and expression skills* are already present in upper secondary schools, but it is the role of secondary education to enhance cooperative practices within the context of education; not only does this statement validate the continuance of cooperative intents throughout various levels of students' education, but it also demonstrates the evolving role of cooperation and education throughout students' academic progression.

When discussing *Issues subject to local decision* in chapter five of the core curriculum, an initial statement identifies a primary focus which is, "ensuring that the decisions support the achievement of the goals of education and promote a school culture that improves the coherence of basic education" (Finnish National Board of Education, 2016a, p. 46). The phrase *achievement of the goals of education* a broad statement that exemplifies an instance of presumed cultural assumptions; by referencing the *goals of education*, and by providing no further clarification as to what these goals are or what they entail, the text is presuming a cultural understanding of the *goals of education*. While these educational goals may be apparent to some the language is indicative of the presence of assumed ways of thinking, acting, and interacting within the field of education. Additionally, reference to the *school culture* more directly identifies a particular, and assumed, atmosphere within the field of school and education, which has the potential to create imbalances in capital or misalignments in habitus. Lastly, *coherence of basic education* is identified as a primary objective and a basis for education providers decisions. This use of coherence demonstrates that the curriculum strives for a consistent and cohesive dynamic that would diminish misalignments *or* diminish the influence and impact of misalignments. Subsequent text in the subsections of this portion of the chapter frequently mention cooperation, which reveals the cultural perception that cooperation is one practice that can facilitate the *goals of education* and *coherence*. For example, the education provider is

responsible for determining, “what are the key goals of and operating methods...for organizing cooperation” (Finnish National Board of Education, 2016a, p. 46), “how is cooperation within the municipality/school and with actors outside the school organised” (Finnish National Board of Education, 2016a, p. 46), “what are the key goals and organisational practices of cooperation between home and school” (Finnish National Board of Education, 2016a, p. 46), and “how are cooperation between various actors as well as their respective responsibilities and division of labour organised” (Finnish National Board of Education, 2016a, p. 48). These statements reveal that *cooperation* is considered to be a vital component that is perceived to be embedded in interactions and practices *within the municipality/school and with actors outside the school, between home and school*, and with regards to the organization and *division of labour*.

Cooperation is also evident within various aspects of the mathematics curriculum, and as it relates to mathematics, *cooperation* is embedded in the instructional practices. The curriculum notes that, “The pupils are encouraged to present and discuss their solutions” (Finnish National Board of Education, 2016a, p. 403), and “The pupils’ team work skills are developed in teaching and learning” (Finnish National Board of Education, 2016a, p. 403). In this first statement, *cooperation* is presented as an action or a practice when it notes that students *discuss their solutions*. In the second statement, *cooperation* is visible through the phrase *team work skills*. This phrase is a description of *cooperation* within the mathematics context, and it is perceived an integral part of the content area as it is *developed in teaching and learning* of mathematics.

When discussing assessment in chapter six of the basic core curriculum, it is directly stated that, “Cooperation between home and school is part of a good assessment culture” (Finnish National Board of Education, 2016a, p. 49). In this instance, *cooperation* is the practice that enables the socially determined *good assessment culture*. Cooperation entails a practice in

which students and “guardians are informed at sufficiently frequent intervals of the pupils’ progress, working skills and behaviour” (Finnish National Board of Education, 2016a, p. 49). This practice of assessing and informing students and guardians embodies the cooperation that is emphasized within the curriculum; this statement also demonstrates that communicating with students and guardians is perceived to be a component of the assessment process and the *assessment culture*. The word choices of *sufficiently* and *frequent* are somewhat arbitrary and reiterate the presence of an understood element or measure within the curriculum that is used to describe the intervals for informing students and guardians. With regards to students who are determined to require supports, the curriculum notes that, “Cooperation with the guardians of pupils requiring special supports is particularly vital” (Finnish National Board of Education, 2016a, p. 49). This statement reiterates the presence of *cooperation* among guardians and the school, but one distinction with this statement is that *cooperation* is weighed more heavily and is considered to be *particularly vital* in specific situations, such as when a student requires support. Additionally, this statement does not include *cooperation* with students as the previous statement did; so, while students’ involvement may be assumed, guardians’ cooperation, in instances where student supports are required, may be perceived to take priority.

When addressing pupil welfare in chapter eight of the basic core curriculum, the title of the first section, *Cross-sectoral cooperation in pupil welfare*, discloses the emphasis upon cooperation in welfare practices and processes. The first section in this chapter begins by describing the dynamics between social welfare and health services with education and notes the cooperation necessary among the various agencies. An open-ended discussion of the cooperation that must occur between and among these agencies and other agencies involved in a students’ is expected; “Promoting pupil welfare is a duty of all employees working in the school community

as well as of experts responsible for pupil welfare services” (Finnish National Board of Education, 2016a, p. 81). This statement identifies an expected role of *all employees working in the school community*. However, this *duty* that the curriculum identifies, which is *promoting pupil welfare* is somewhat broad. While this *duty* does not pinpoint specific practices or processes that employees are expected to implement, it identifies a specific mindset or basis from which all employees should act and make decisions. Cooperation in this mindset is evident with the phrase *in the school community*. Inclusion of this phrase specifies that employees are acting within the network of the school communities, which assumes the participation of other actors and the need for *cooperation*. Psychologists, social workers, and health care personnel are described as those who provide services under the umbrella of pupil welfare. This section also reveals equitable intents with regards to both access and participation in the available services. First, the curriculum notes that, “Services are offered to pupils and guardians in an easily accessible way” (Finnish National Board of Education, 2016a, p. 81-82), and this is followed by mention that, “The participation of the pupil and his or her guardian in pupil welfare, systematic cooperation and providing information about pupil welfare make pupil welfare services better known and lower the threshold for accessing the services” (Finnish National Board of Education, 2016a, p. 82). These two statements demonstrate the emphasis placed upon access, participation and cooperation. Additionally, in the latter statement, the phrases *make pupil welfare services better known* and *lower the threshold for accessing* indicate that both *participation* and *cooperation* are perceived to diminish capital and facilitate access.

Within the section, words such as “coherence” and “continuum” indicate intents for smooth transitions for students and families as well as the extension of supports beyond that of formal basic education: “a continuum that extends from pre-primary education to secondary

education and training” (Finnish National Board of Education, 2016a, p. 82). This range of participation in early childhood education through, and beyond, upper secondary education warrants cooperative practices and an educational infrastructure that lends itself to cooperation. The curriculum notes, “The structures, forms and operating methods of cross-sectoral cooperation in pupil welfare are developed in the school community and with various partners” (Finnish National Board of Education, 2016a, p. 82). The *structures, forms and operating methods* that are described in this statement allude to the processes, practices and the habitus that are associated with *cooperation*. The statement also acknowledges that the cooperation that is implemented is *developed in the school community and with various partners*, which alludes to the field within which these cooperative practices manifest. Additionally, the statement’s mention of *the school community* and *various partners* exemplifies the intertwined, and bidirectional, nature of cooperation with the community from which these *structures, forms and operating methods* originate; each contributes to one another and cooperation generates these *structures, forms and operating methods* in the community, but cooperation is also constructed by these *structures, forms and operating methods*.

The individual paired with the community. Chapter two discusses the *Underlying values of basic education* and one subsection titled *Uniqueness of each pupil and right to good education* identifies the ideals that drive educational practices. This title and the use of the adjective *good* demonstrates a culturally established meaning of what is assumed to be and what is associated with the descriptor, *good*. When discussing the underlying values that allow for a *good* education, the curriculum notes that, “Each pupil has the right to grow into his or her full potential as a human being and a member of society” (Finnish National Board of Education, 2016a, p. 15). As it appears in the title of this subsection, the phrase *the right to* is repeated in

this statement, and its use suggests a degree of power that is implicit in the educational system. Additionally, this statement reveals a cultural perception that education is a pathway for attaining *his or her full potential as a human being and a member of society*. It indicates a view that students possess an individual and collective proclivity for achieving within their educational careers with reference to students as *a human being and a member of society*. Following this description of habitus, the curriculum identifies practices that enable the fruition of this perspective when it states that, “To achieve this, the pupils need encouragement and individual support as well as experiences of being heard and valued in the school community” (Finnish National Board of Education, 2016a, p. 15). The initial clause *to achieve this* demonstrates that the subsequent text is viewed as a way of achieving the previously discussed perspectives and *rights* of students. With mention of *encouragement and individual support* as well as *experiences of being heard and valued*, the curriculum is identifying approaches for implementing practices and processes that will facilitate students’ *right to grow into his or her full potential* while also demonstrating cognizance of students’ position as an individual but also as a member of a broader context. This same notion is evident in the mathematics curriculum when it describes a mathematics assessment process; “When the pupils work together, the assessment focuses on the actions and products of both the individual group members and the entire group. Feedback guides the pupils to understand the importance of the efforts and development of each group member” (Finnish National Board of Education, 2016a, p. 255). This statement promotes students’ mindfulness of the influence of their *actions and product* can have, not only upon themselves and their own learning, but also upon *the entire group*. Additionally, by noting *the importance of the efforts and development* of all students in the group, the curriculum considers the individuals’ contributions to their group by noting *the efforts* in mathematics activities; by

including consideration the *development of each group member*, the text is also taking into account the influence of the group upon each individual within mathematics practices.

Within chapter four of the basic core curriculum, the text reinforces the intertwined dynamic between the individual and the community. When discussing a school's culture, the curriculum states that, "The manner in which the adults act is transmitted to the pupils, who adopt values, attitudes and customs prevalent in their school community" (Finnish National Board of Education, 2016a, p. 27). This statement is a powerful and explicit acknowledgement of several perceptions embedded within the curriculum. As previously discussed, and with the text's description of adults' actions as being *transmitted to the pupils*, one evident role assigned to adults is modeling practices for students. Additionally, with this responsibility, the perceived influence of an individual's actions, upon a student(s) is apparent with the description of *pupils who adopt values, attitudes and customs prevalent in their school community*. This phrase also recognizes how the culture of a *school community*, or field, infiltrates participants' habitus, or as stated by the curriculum, *values, attitudes and customs*.

When discussing *learning environments*, or educational fields, in chapter four of the basic core curriculum, the text notes that, "Learning environments must support the growth, learning and interaction of the individual and the community" (Finnish National Board of Education, 2016a, p. 30). Based upon this description, education is perceived and intended to serve not only individual pupils but also the greater community. When constructing learning environments, the curriculum supports this perception by stating that, "The holistic well-being of the school community and each pupil is taken into account in the development of learning environments" (Finnish National Board of Education, 2016a, p. 31). In this instance, *the school community* precedes *each pupil* which may be indicative of the approach taken and the prioritization of

considerations *in the development of learning environments*. This pairing of both individualistic and collectivist notions is also visible in the curriculum's description of *working methods*. The curriculum notes that, "Varied working methods support and direct the learning of the entire teaching group and each pupil" (Finnish National Board of Education, 2016a, p. 31). Use of the term *teaching group* suggests the inclusion and consideration of all participation including students, teachers, and other participants in the teaching and learning practices. Consideration of *each pupil* follows mention of *the entire teaching group*, which again indicates a potential prioritization of the group over each individual. Within discussion of mathematics content and instruction the curriculum references practices that incorporate the pairing of both individual and collective components. For grades one to two, the mathematics curriculum states that, "The pupils become used to working independently and together with others" (Finnish National Board of Education, 2016a, p. 138). In this statement, the phrase *become used to* signifies that *working independently and together* becomes a common and recurrent process within the mathematics classroom. Additionally, for grades three to six, the mathematics curriculum states that pupils, "work together and independently" (Finnish National Board of Education, 2016a, p. 254), which reiterates both individual and group tasks throughout students' mathematics education. At this upper secondary level, this sequencing shifts, but in the introductory descriptions of the mathematics curriculum, the text references practices that enable, "the students to work independently and together with others" (Finnish National Board of Education, 2016b, p. 138).

With regards to assessment, consideration of the individual and a collective group is evident in chapter six of the basic core curriculum. Specifically, when discussing students' self-assessment, it is stated that, "Both as individuals and as a group, the pupils are guided in observing their learning and its progress and taking note of factors that affect them" (Finnish

National Board of Education, 2016a, p. 51). This statement signifies that when self-assessing, two skill sets are being fostered. Students are encouraged to monitor *their learning and its progress* as both an individual and also as a member of a group: indicating that instructional practices both individual and group activities where student(s)' degree of responsibility and the assigned roles will shift. The instructional guidance in the consideration of *the factors that affect them* demonstrates a cognizance of an individual's or groups' positioning within a broader context. *The factors that affect them* demonstrates a collectivist perspective that alludes to the network within which an individual or a group is set, and it accounts for outside influences infiltrating an individual or group dynamic. This perception is evident in the upper secondary curriculum's discussion of mathematics. The curriculum identifies the, "opportunity to strengthen the foundation for his or her studies in mathematics and perceive mathematics as a beneficial and useful tool in explaining and managing, for instance, events and situations in the society, economy, and nature" (Finnish National Board of Education, 2016b, p. 139). Here, the curriculum begins with consideration of the individual student when it notes *his or her studies in mathematics*. Following this, the focus shifts away from the student to consider how students' application of mathematics is a *tool* that can be used in *events and situations in the society, economy, and nature*. In this particular instance, the curriculum is conveying a perception that individuals' acquisition of mathematics has the potential to contribute to collectivist interactions, including social and economic networks as well as the environment. This cognizance of the individual and their participation with a larger network is again evidenced in the upper secondary curriculum's discussion of mathematics and curricular objectives. Within the first subtopic, *numbers and number sequences*, the opening objective states an intent that the student "reflects on the significance of mathematics from the perspective of the individual and the society"

(Finnish National Board of Education, 2016b, p. 139). In this statement, the curriculum is encouraging students to maintain awareness of the context in which mathematics is set and to understand that mathematics can be perceived through an individualistic or collectivist lens. Noting *the significance of mathematics* suggests that mathematics is perceived to possess a substantial role in both individual and social dynamics. Since this objective requires *that the student reflects*, this statement also conveys the curriculum's intent to influence students' way of thinking about mathematics.

When discussing learning as an intent of assessment, the basic core curriculum notes that, "Individually and in groups, the pupils are guided to examine their progress and the results of their work in proportion to the objectives and the criteria for success that were agreed upon in joint discussions when they began the task in question" (Finnish National Board of Education, 2016a, p. 51). Several phrases in the statement express cooperative actions or practices. The direct mention of students working *individually and in groups* demonstrates opportunity for cooperative activities; use of the word *joint* signifies a collaborative effort and use of the word *discussions* indicates a practice that is comprised of interactions with others. Additionally, a subsection in chapter six of the basic core curriculum, the text describes *working skills* as a key component in the assessment process. When discussing the instructional practices associated with the development of these working skills the curriculum notes that, "The teachers guide the pupils both as individuals and as a group to plan their work and to use working methods that promote learning" (Finnish National Board of Education, 2016a, p. 52). The phrase *both as individuals and as groups* reiterates the implementation of instructional practices that foster students' application of working methods in an individual context and in a group setting. This repeated dichotomy of the individual and a group signifies that a cultural emphasis on practices

that enable acquisition of learning and work skills in an independent or collect setting. The recurring discourse in each of the three quotes cited above can be noted; for example, the words *individual* and *group* are conjunctively paired with one another at the beginning of each statement. With mention of each of these words, the individual precedes mention of the group. This may be indicative of a cultural mindset or cultural approach that associates “the individual” with a larger group or community. Additionally, in each of the statements in which *individual* and *group* are mentioned, the verb *guide* or *guided* is used: indicating of an intent to create a supportive, and cooperative, assessment environment.

With review of chapter eight of the basic core curriculum titled, *Pupil welfare*, the curriculum reveals the individual and communal intents through its welfare practices and structures. When providing an introductory description, the curriculum notes, “Pupil welfare means promoting and maintaining the pupils’ good learning, good mental and physical health as well as social well-being and activities that improve the preconditions for these in the school community” (Finnish National Board of Education, 2016a, p. 81). This statement establishes and understanding of the perceived progression of the intentions underlying the implementation of pupil welfare. The statement opens by addressing the individual needs of students when it notes concern for *pupils’ good learning, good mental and physical health*. It then branches out from the individual to encompass *social well-being and activities*, and finally, the statement culminates with the belief that each of these factors contribute to *the school community*. The inclusion of various actors within the practices and processes of pupil welfare is apparent when the curriculum notes the inclusion of both students and guardians and subsequently states that, “Where necessary, other partners are also invited to participate in this cooperation.” (Finnish National Board of Education, 2016a, p. 81). The curriculum goes on to state that, “When

concerns pertaining to the welfare of the school community or the pupils arise, solutions are sought together with the pupils and their guardians” (Finnish National Board of Education, 2016a, p. 81). These two statements indicate the immediate inclusion of and cooperation with both students and guardians in pupil welfare processes. The conditional clause, *where necessary*, suggests an automaticity to students’ and guardians’ involvement, and contrastingly, participation of *other partners* is employed only when required. In the second statement, the curriculum addresses processes related to *the welfare of the school community or the pupils*; unlike statements made in chapter six on assessment, this phrase identifies the school community prior to the individual. This sequence may be indicative of a prioritization of the school community over the individual within the context of pupil welfare; however, the statement continues and bypasses the school community to hone in upon the individual when it specifically mentions *the pupil and their guardians*. Additionally, when the curriculum notes that *solutions are sought together with the pupil and their guardians*, the use of the word *together* highlights the collaboration that occurs within pupil welfare processes. Noting that *solutions are sought* also suggests that there is a fluidity to the process of developing and implementing pupil welfare solutions. By stating that solutions are obtained in cooperation with *pupils and their guardians*, the curriculum is establishing opportunity for a collaborative process; by assigning capital to both pupils and guardians, the open-ended processes enable students and guardians to participate in pupil welfare, not as outsiders, but as members.

When discussing the actors involved in the pupil welfare process, the curriculum notes that, “The duties of these experts are related to the individual, the community and the cooperation alike” (Finnish National Board of Education, 2016a, p. 81). This text explicitly identifies cognizance of both the individual and the community. The curriculum then goes on to

explain that various groups are composed in order to address and support the needs of either an individual, a group, or the broader school community. In order to address the needs of an individual or an individual group, *expert groups* are “assembled in order to estimate the need for support of an individual pupil or a group of pupils and to organise pupil welfare services” (Finnish National Board of Education, 2016a, p. 82). Mention of *an individual pupil or group of pupils* highlights a practice that allows for the tailored considerations of a particular student or group of students; formation of this group also demonstrates a school community practice that is established in order to meet the needs of individuals or groups of individuals within that school community.

In addition to expert groups, education providers are responsible for selecting a steering group and a school welfare group. The steering group focuses on pupil welfare within a larger context: establishing the logistics for planning, implementing, and overseeing welfare within schools. This steering group supports the school community as a whole, and it is responsible for monitoring the processes related to pupil welfare. A school welfare group is created within each school and includes professionals from various disciplines, such as health care, social work, and education. This group also acts cooperatively with a broadened lens in order to support the pupil welfare practices of a school community. The curriculum notes that, “The group’s key task is promoting well-being and safety in the community and otherwise implementing and developing communal pupil welfare” (Finnish National Board of Education, 2016a, p. 82). This contemplation of students’ well-being, safety and support is a recurrent notion throughout the basic core curriculum.

Facilitating peace and a supportive environment. When discussing values of education, students’ well-being and the establishment of a peaceful and safe learning environment are

paramount. Chapter two of the basic core curriculum states that, “Basic education supports the pupil’s growth as a human being who strives for truth, goodness, beauty, justice and peace” (Finnish National Board of Education, 2016a, p. 16). Within this quote, the text refers to an individual first a *pupil* and then as *a human being*. This shift in identity demonstrates a shift in the perspective of individuals from the role of a student, which implies one acting within the context of an academic setting, to that of a human, which implies a broader and more fluid context in which one acts; with this shift and this extended field, concern for students’ needs is widened to also incorporate concerns for their emotional, social and physical well-being. With this focus upon students as human beings, the statement above also identifies educational goals that extend beyond academic content to include both philosophical and moral intents *for truth, goodness, beauty, justice and peace*.

This latter term, *peace*, is a recurring characteristic that the curriculum strives for with regards to a school’s culture and learning environment. For example, in chapter four of the basic core curriculum when discussing a learning community, the curriculum states that, “Reflecting on the goals, regular evaluation of one’s own work and a peaceful atmosphere promote the learning of a community” (Finnish National Board of Education, 2016a, p. 28). These three characteristics demonstrate cultural perceptions of features that create an effective educational environment, and the listing these three features suggests a perceived connectedness among these educational characteristics. This notion of a *peaceful atmosphere* is reiterated at various points throughout this chapter. Statements such as, “The community appreciates empathy and friendliness” (Finnish National Board of Education, 2016a, p. 28), “School work aims at predictability in daily activities and at a peaceful atmosphere” (Finnish National Board of Education, 2016a, p.28), and “A calm and accepting mood, good social relationships and an

attractive environment promote a harmonious and pleasant working atmosphere” (Finnish National Board of Education, 2016a, p. 28). Each of these descriptions demonstrates intents for a *peaceful atmosphere*, and the curriculum identifies practices that are viewed to facilitate this peace. *Empathy, friendliness, and calm* signify ways of being that are promoted within the context, or field, of a learning community. *Predictability in daily activities* and *good social relationships* are encouraged practices within the school setting. The third section of this fourth chapter is titled *Learning environment and working methods*. Within this section, when addressing the learning environment, the curriculum again reiterates particular descriptions that demonstrates an emphasis upon and a cultural belief in the importance of “a peaceful and friendly working atmosphere and a calm, peaceful mood” (2016a, p. 31). This text restates three particular words that are indicative of the ideals of a learning environment: *peaceful, calm, atmosphere* and *mood*. Both *peaceful* and *calm* convey a cooperative and serene habitus, or *mood*, for which the curriculum, and the Finnish culture, strive. *Atmosphere* is also frequently used in conjunction with the adjective *peaceful*: indicating that this habitus is a prioritized disposition with the school context. With this discussion of the idealized *mood* or *atmosphere*, the curriculum identifies particular practices and working methods that support the attainment of a *peaceful* setting: “Differentiation supports the pupils’ self-esteem and motivation and promotes a peaceful setting for learning” (Finnish National Board of Education, 2016a, p. 32). Mention of *differentiation supports* not only identifies an instructional practice that is promoted in the curriculum, but it also demonstrates a perception that instructional practices contribute to students’ learning attitudes, their *self-esteem and motivation*. Furthermore, reference to a *peaceful setting* indicates a belief that that practice of *differentiation* contributes to and fosters a *peaceful setting*; lastly, the addition of *for learning* reiterates the influence that a learning

environment has upon students' education and implies that the learning environment is a medium through which learning is filtered.

This consideration of students' attitudes and self-esteem is evidenced in the mathematics curriculum across all grade levels of the basic core curriculum. The text for grades one and two states, "The instruction supports the pupils' positive attitude towards mathematics and their positive self-image as learners of the subject" (Finnish National Board of Education, 2016a, p. 136). Additionally, within each of the mathematics objectives of instruction, the curriculum identifies a supportive intent within the first objective at each grade interval; for grades one to two, the curriculum notes, "the development of his or her positive self-image and self-confidence" (Finnish National Board of Education, 2016a, p. 137), for grades three to six, it states, "to support a positive self-image and self-confidence" (Finnish National Board of Education, 2016a, p. 252), and for grades seven to nine it notes, "to strengthen the pupil's motivation, positive self-image, and confidence as a learner of mathematics" (Finnish National Board of Education, 2016a, p. 403). In each of these initial mathematics objectives, the recurrent phrase, *positive self-image*, is identifiable. This demonstrates the mathematics curriculum's constant awareness of students' well-being and it suggests a supportive instructional process that fosters *positive self-image*. At the secondary level, the basic syllabus for mathematics identifies an objective that strives for students to acquire, "positive learning experiences when working with mathematics" (Finnish National Board of Education, 2016b, p. 145). As with the basic core curriculum, this phrase demonstrates an intent for students to engage in *positive learning experiences*, and by stating *when working with mathematics* the curriculum reveals a perception that mathematics involves an interaction and exchange as students are *working with* the content area.

Within chapter five, discipline is identified as a facet of education that contributes to the conception of a *peaceful* learning community and environment. Throughout the third section entitled, *Disciplinary educational discussions and the use of disciplinary measures*, the curriculum explains that, “The school has many ways of encouraging a peaceful working atmosphere, key ones of which include guidance and feedback provided by the teacher, cooperation and shared responsibility and care” (Finnish National Board of Education, 2016a, p. 39). *Guidance and feedback* are the two initial instructional practices that are identified and perceived to facilitate peace. The statement also gives insight into a perceived role of teachers, which is to be the individuals to *provide* these practices; *cooperation and shared responsibility* account for the social and collaborative nature of instructional practices and the use of the word *care* reiterates a focus on creating a supportive and nurturing learning setting. Shortly after this, the curriculum notes that, “By developing pedagogical solutions and strengthening an atmosphere of trust and caring, preconditions can be created for a peaceful setting for school work” (Finnish National Board of Education, 2016a, p. 39). The phrases *pedagogical solutions* and *strengthening an atmosphere* describe the disciplinary practices and processes that contribute to a *peaceful setting for school work*. These descriptions reveal a perception that disciplinary measures as components of, or *preconditions* to instructional practices. Intertwine with these descriptions of disciplinary measures, the Basic Education Act and terms such as “legal” or “referred to in legislation” (Finnish National Board of Education, 2016a, p. 39) are consistently referenced with discussion of disciplinary measures and intents for peace. The concurrent use of these terms and instructional concepts indicates the bounds within which disciplinary measures and procedures fall. Discipline is presented as and perceived as an instructional tool that allows for learning to occur and to promote a safe and *peaceful* school

culture. Inclusion of legislative acts within this discussion is also indicative of intents that extends beyond to school culture into political and social realms of the broader community and society.

Peaceful is again the descriptor used to explain the educational environment that schools should strive for, and the most common approach is disciplinary measures is discussion that allows for the input and involvement of the student(s) in order to facilitate restorative practices; a tiered approach of disciplinary measures is subsequently noted when the curriculum describes that, “Disciplinary measures referred to in the Basic Education Act include detention, a written warning and suspension for a set period” (Finnish National Board of Education, 2016a, p. 39). Mention of the *Basic Education Act* implies a demand for adherence to that which is set forth in legislative acts, and the progression of these disciplinary measures indicates attempts to minimize the enactment of higher-level disciplinary actions. Following this description, the curriculum provides an explanation of the rationale for the implementation of such disciplinary measures when it states that:

In order to safeguard a peaceful setting for school work, a pupil may be banned from participating in education at the most for the remainder of the school day if there is a risk that the pupil’s violent or aggressive behaviour will endanger the safety of another pupil or a person or that the pupil’s disruptive behaviour will inordinately complicate teaching or an activity associated with it (Finnish National Board of Education, 2016a, p. 39).

This statement holds several implications with regards to the role of disciplinary practices and processes and the goal of establishing and maintaining *a peaceful setting for school work*. The curriculum identifies another disciplinary measure that may be implemented when it notes that *a pupil may be banned from participating in education*. Use of the word *banned* conveys a strong

enactment of disciplinary measures, and the phrase *in education* broadens that degree to which a student cannot participate, and it suggests that this exclusion extends all aspects associated with education. The curriculum then clarifies a maximum duration for this exclusion when it notes that this would occur *at the most for the remainder of the school day*, and the text also explains criteria that would warrant such exclusion. Noting that if a student's action or behavior *will endanger the safety of another pupil or person* provides an instance when *peace* would not be maintained and it also demonstrates the curriculum's recognition of the interactive nature of education and the influence of one individual upon another. Lastly, noting that a student's exclusion could also occur if the behaviors *inordinately complicate teaching or an activity associated with it* demonstrates that the enactment of disciplinary measures is acceptable in scenarios beyond those that jeopardize students' safety. This phrase indicates that disciplinary measure, and exclusion from participating, is acceptable when learning processes are perceived to be jeopardized. Use of the word *complicate* indicates a social intent to maintain a degree of convenience and ease in the activity of the classroom; based upon this statement, if a behavior presents as a barrier to this ease or the accessibility of *teaching or an activity associated with it* then a disciplinary measure is perceived to be acceptable in order to maintain *a peaceful setting for school work*.

In one of the final sections of chapter five of the basic core curriculum, *Other activities that support the goals of education*, the text portrays the comprehensiveness of educational activities and contexts when it addresses both activities and settings outside of the classroom. The text also conveys an awareness of students' well-being and the curriculum's recurring recognition of students' humanness; "School meals, activities during recess, morning assemblies at school, celebrations, excursions, study visits and school camps and, as far as possible, the way

to school will be organised to support the objectives set” (Finnish National Board of Education, 2016a, p. 44). The listing of these various activities demonstrates practices that facilitate cooperation and consideration of students’ well-being in the processes of learning. One particular activity noted above, that also holds its own subsection in chapter five is *school meals*. In this section, the curriculum describes how each student attending basic education receives a free meal each school day. The school meal is seen not only as a nutritional necessity, but it is perceived as a core component of the school day and a core component that supports students’ learning: “A well-timed and unhurried meal and possible snacks ensure that the pupils have enough energy to get through the school day” (Finnish National Board of Education, 2016a, p. 45). Use of descriptors such as, *well-timed* and *unhurried* suggest that the school meal is not seen as a burdensome responsibility. Instead, the school meal is perceived as an instructional practice that is integrated into the day; students participate in the planning of the school meal, and it is a practice that is part of the education curriculum and experience. Since all students participate in and have access to the school meal, this practice may also serve as an equalizer with regards to demographic factors, such as social economic status: demonstrating an instance where a particular practice serves as a mechanism for increasing capital.

The curriculum also notes that, “School meals have an important recreational role, and they promote a sustainable way of living, cultural competence and the objectives of food-related education and instruction in good manners” (Finnish National Board of Education, 2016a, p. 45). Phrases such as *recreational role*, *cultural competence*, and *instruction in good manners*, demonstrate the inclusion of activities that promote not only academics but also practices that enable growth in students’ social, cultural, and ethical aptitudes. The promotion of such activities reveals a cultural view of what education encompasses and what learning entails; promotion of

perspectives that are entrenched with cultural subtleties exemplifies practices and processes that endorse a particular habitus that is disseminated throughout the curriculum and students' school day. In particular, the curriculum's reference to *good manners* exemplifies a phrase that possesses implicit understanding and requires cultural inferencing; such a phrase has the potential to manifest capital and misalignments in habitus.

One particular practice that may not typically coincide with *good manners* is assessment. In chapter six of the basic core curriculum, behavior and *good manners* are incorporated into the assessment process and the curriculum reveals a quality of the individual that is a perceived responsibility in the Finnish education process. Within a subsection titled, *Behaviour as an object of assessment*, the curriculum explicitly states that, "Guiding behaviour and imparting knowledge and skills related to good manners are part of the school's educational task" (Finnish National Board of Education, 2016a, p. 52). The words *guiding* and *imparting* are indicative of an initiative to influence the way in which students participate and interact within the Finnish educational setting. References to the transference of *knowledge* and *skills related to good manners* portrays the culturally established ideal of *good manners* as a practice that is assumed and somewhat unquestioned. This perception and presentation of *good manners* demonstrates an instance where culture unknowingly infiltrates curricular practices and has the potential to manifest capital within the educational setting. While this potential capital is evident, the curriculum reiterates its cultural habitus with well-meaning intentions; "The pupils are guided in taking other people and the environment into consideration and following jointly agreed ways of working and rules" (Finnish National Board of Education, 2016a, p. 52). The phrase *taking other people and the environment into consideration* demonstrates the collectivist perspective that drives this instruction, and the use of the word *jointly* shows the cooperative nature of the

processes for establishing procedures; however, the *ways of working and rules* indicate a perception that there are particular, customary behaviors and forms when operating within the context of education. The curriculum continues by stating that, “In various interactive situations of the school, they are taught appropriate, situation-aware behaviour and good manners” (Finnish National Board of Education, 2016a, p. 52). This description reiterates that latter point, and further indicates that students are not only taught directly about *good manners* and appropriate *behavior*, but this statement also highlights the doxa that are infused within the curriculum and within education; words such as *good* and *appropriate* are used to describe *behavior* and *manners* and these descriptors are culturally established and socially assumed characteristics that facilitate a habitus that aligns with the Finnish culture. Students who are not familiar with the cultural practices may not have as great an awareness of *good manners* and therefore, their habitus may not align as fully with the local culture. This could create potential imbalances in cultural capital within the education setting. Additionally, the phrase *situation-aware behavior* directly concedes the presence of *fields*, which necessitate a particular *habitus*. While this cultural bias is evident within the text, the curriculum attempts to create objectivity in the assessment of behaviors with statements such as the following: “it is particularly important to ensure that the assessment does not focus on the pupil’s personality, temperament or other personal characteristics” (Finnish National Board of Education, 2016a, p. 52); noting that students *personality, temperament, and other personal characteristics* are not assessed suggests an attentiveness to potential partialities in the assessment of behavior, an awareness of habitus, and efforts to diminish the role of capital in behavior measures.

When discussing pupil welfare in chapter eight of the basic core curriculum, the text reiterates sentiments that align with those noted in discussion of students’ behavior and

disciplinary measures. In the introductory pages of chapter eight second section, *Communal pupil welfare*, the curriculum states that, “A pupil shall be entitled to a safe learning environment. This includes physical, psychological and social safety” (Finnish National Board of Education, 2016a, p. 83). Use of the word *entitled* communicates that *safety* in all forms, *physical, psychological and social*, is an assumed condition in which a student should learn. The section continues by explaining the intents behind pupil welfare’s practices and processes. “A peaceful atmosphere promotes a good disciplinary climate. School rules improve the safety, comfort and internal order of the school community” (Finnish National Board of Education, 2016a, p. 83). The term *peaceful* is again identified in conjunction with the school *atmosphere*, and in this context of communal pupil welfare, a *peaceful* environment is seen as facilitating discipline. This description reveals an alternate perception of the directionality in the dynamic between a *peaceful atmosphere* and *discipline*. In previous discussions of *peace* and *discipline*, the curriculum presented discipline as the practice that supported a *peaceful environment*. In the current description, the text shifts this perspective, and instead, presents a *peaceful atmosphere* as that which fosters *discipline*.

The second portion of the statement above indicates that *school rules* are viewed as a practice that *improves* the processes within *the school community*. The words *safety* and *comfort* convey the curriculum’s intent to establish a nurturing environment for students through the implementation of *school rules*. Use of the phrase *internal order* implies a curricular aspiration to implement school processes in a particular way—in a manner that emanates a degree of ease and stability within the school culture. This notion of a *peaceful* and *nurturing* environment is reiterated within discussion of *Individual pupil welfare*. When describing students’ active participation in the individual pupil welfare process, the curriculum notes that, “The work should

be organised so that it allows the pupil to experience the situation as peaceful and feel that he or she is heard” (Finnish National Board of Education, 2016a, p. 84). Not only does this statement exemplify students’ inclusion in the pupil welfare process, but it also demonstrates consideration of how the student will *experience the situation*. In addition to supporting “the pupil’s holistic development, health, well-being and learning” (Finnish National Board of Education, 2016a, p. 84), this attention to the student’s *experience* demonstrates the supportive and empathetic nature of the processes that allow the student to regard the process *as peaceful and feel that he or she is heard*. It also demonstrates a systematic approach that allows for open dialogue and one that welcomes perspectives from individuals in various positions within the educational context.

Education policy

Finnish Education Related Acts and Decrees

Statements throughout the Basic Education Act (1998) clearly align with intentions noted throughout the curriculum. For example, within the first educational objective, the Basic Education Act describe that the purpose of education is “to support pupils’ growth into humanity and into ethically responsible membership of society” (Ministry of Justice, 1998, p. 1). This intention aligns with the curriculum’s perspective and recognition that *individuals are part of a greater community*, first with mention students’ *growth into humanity* and subsequently with reference to students’ *membership of society*. When discussing the educational foundation of Finland, the Basic education act reiterates its recognition of *students’ humanness* with consideration of their *well-being* in education; this is identifiable when the Act states that education is, “to promote healthy growth and development in the pupil” (Ministry of Justice, 1998, p.2). This consideration of students’ well-being and comfort is echoed with discussion of transportation to school and the intent “to make pupils’ travel to school as *safe and short* as

possible” (Ministry of Justice, 1998, p. 3). This statement indicates the legislation’s consideration of students’ safety but use of the phrase *short as possible* also suggests attention to *students’ comfort and convenience*.

This consideration for students’ well-being beyond the school setting is also evident in the Act’s discussion of students’ work load in the first of two criteria; “The pupil’s work load in basic education must be such as to allow time for rest, recreation and hobbies over and above the time spent in school, school travel and homework” (Ministry of Justice, 1998, p. 11). This statement holds several implications; first, with regards to facilitating a supportive environment, the Act’s cognizance *to allow time to rest, recreation and hobbies* demonstrates the perceived importance of creating an educational structure that is not overpowering or cumbersome for students. The listing of *time spent in school, school travel, and homework* indicates the school and formal education are perceived to be a part of students’ lives but not their entirety. *Safety* is a priority in the Basic Education Act, and there is a full section of the Act dedicated to students’ *Right to a safe learning environment*. In this section, the document states an intent of “promoting internal order in the school, unhindered learning, and the safety and satisfaction of the school community” (Ministry of Justice, 1998, p. 13). The mention of *internal order* alludes to an understood and somewhat automatic compliance with established norms and rules of the context, which may be indicative of doxa; however, internal order also is perceived to be that which facilitates *safety and satisfaction*. This explicitly references concern for and prioritization of *students’ safety* but use of the word *satisfaction* conveys an intended comfort in students’ academic and educational settings. Descriptions of pupil welfare also demonstrate the legislation’s well-rounded perspective of students’ growth when it states should be, “promoting and maintaining good learning, good mental and physical health and social well-being” (Ministry

of Justice, 1998, 14). Here, the Act is identifying educational objectives as well as cognitive, physical, and social emphases. This statement suggests that education is perceived to encompass various facets of a student's overall growth and development.

When describing lesson hours, the Basic Education Act references *cooperation* three times; in particular *home-school cooperation* is noted—indicating that it is perceived as a core component of curricular considerations. *Home-school cooperation* is identified shortly after when discussing curriculum. *Pupil assessment* is addressed within the Basic Education Act and an initial statement indicates that, “The aim of pupil assessment is to guide and encourage learning” (Ministry of Justice, 1998, p. 10). Use of the phrase *to guide and encourage* demonstrates the supportive nature that is enforced in Finnish assessment practices, and it is also indicative of the underlying purposes of assessment.

Cultural Influences in Education and Mathematics

Within the brochure, *Finnish Education in a Nutshell*, one particular section demonstrates practices that foster a *safe and supportive* learning environment. At the pre-primary level, *creativity* and *individualization* are palpable characteristics; the brochure explains that, “Learning through play is essential” (Finnish National Agency for Education, 2017, p. 15). This statement demonstrates a cultural recognition of children's developmental stage, and it also signifies an *open-ended* approach to learning. This *individualization and openness* is echoed when the text states that, “national core curriculum leaves room for local variations” (Finnish National Agency for Education, 2017, p. 15). This intentional fluidity that is identified in the national core curriculum demonstrates the intents to allow for *individualization and creative* practices within students' instruction and educational activities, and this fluidity is reinforced with discussion of assessment practices. The brochure indicates that national assessments are

absent from basic education; this absence of more restrictive educational practices, such as national assessments, aligns with the fluidity of the curriculum and the allowance for a more open-ended educational approach. With regards to assessment, the brochure explains the cultural and educational perception of assessment; “assessment is part of daily schoolwork” (Finnish National Agency for Education, 2017, p. 16); this practice of including assessment in students’ everyday educational processes facilitates a supportive and unthreatening conception of learning and assessment. Descriptions in this brochure indicate that assessment is perceived to be an instructional tool that contributes to the learning process and fosters students’ own self-reflection through supportive and consistent means.

(b) What features of mathematics curriculum (assessment, specified curriculum resources, teachers’ role, and/or students’ international, mathematics performance) are linked to different kinds of habitus?

Figure 4 summarizes the findings related to the second portion of research question two. Displaying the characteristics of the mathematics curriculum that were identified in the analysis of both the basic core curriculum and the upper secondary schools content, *Figure 4* also illustrates the overarching habitus connected to these features, including a *way of being* that embraces multiple perspectives, reflection, resilience, and lifelong learning.

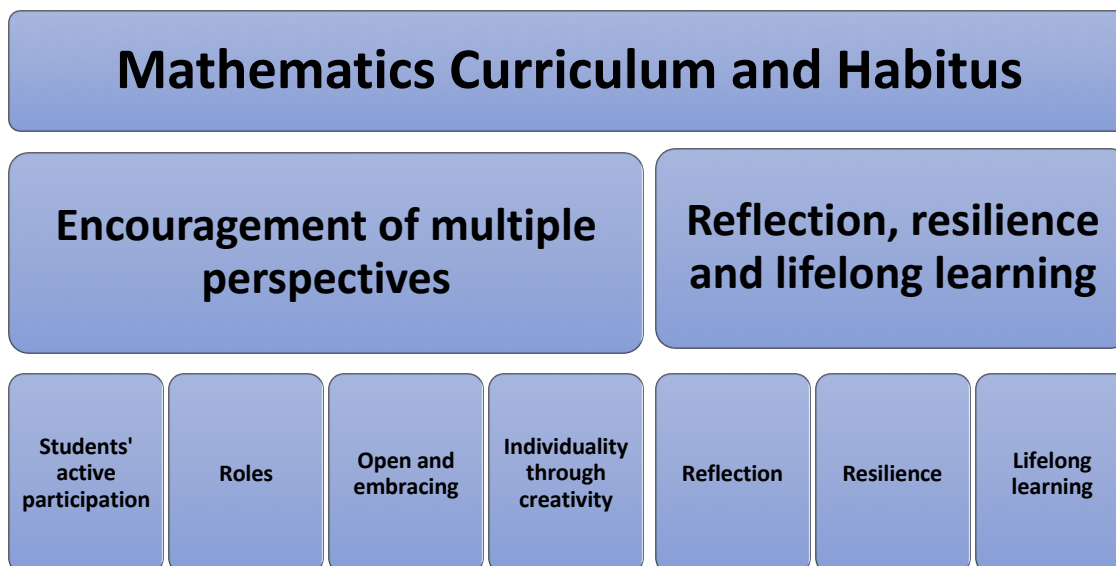


Figure 4. Mathematics Curriculum and Habitus

Mathematics Curriculum and Habitus

Encouragement of Multiple Perspectives and Approaches

Students' active participation. Throughout the basic core curriculum, students' active participation is visible, not only in their involvement in instructional activities, but also in the planning and implementation of instructional processes. In the second section of chapter four, a subsection titled, *Participation and democratic action*, provides various aspects where students' participation is promoted. The text also provides a glimpse into the underlying rationale for the consistent and extensive focus on students' active participation when it states that, "A school culture that promotes participation, realises human rights and operates democratically lays a foundation for the pupils' growth into active citizens" (Finnish National Board of Education, 2016a, p. 29). The curriculum's intent to produce *a school culture that promotes participation* demonstrates an openness to versatile approaches, a welcoming attitude toward feedback and progress, and an intent to diminish capital within its educational structure. This statement also demonstrates an inclination towards democratic approaches, and it reveals an ultimate goal of

education, which is to foster *pupils' growth into active citizens*. With regards to the curriculum's discussion of mathematics curriculum, similar messages are echoed. The curriculum states that, "The instruction is founded on topics and problems that are familiar and of interest to the pupils. The aim is to create a learning environment in which mathematics is studied in a functional manner, using various tools" (Finnish National Board of Education, 2016a, p. 138). Use of the phrase *instruction is founded on* demonstrates that the pupils are the driving force behind mathematics instruction, as the *topics and problems* that are selected *are familiar and of interest to the pupil*. This reiterates that students possess a degree of capital within the planning of instruction. The second statement reiterates the practicality and cognizance of students' participation within the broader cultural when it mentions that *mathematics is studied in a functional manner*. At each of the grade level intervals (1-2, 3-6, and 7-9) the mathematics curriculum emphasizes the functionality of mathematics instruction when it notes that, "A concrete and functional approach is essential in the teaching and learning of mathematics" (Finnish National Board of Education, 2016a, p. 136, 252, 402). The repetition of this statement in each of the three mathematics curriculum chapters, as well as, the explicit use of the word *essential* to describe the significance of *a concrete and functional approach* in mathematics demonstrates the emphasis placed on this instructional perspective. It also indicates that *mathematics* is a content area that is perceived to necessitate functional applications. When describing content areas within the objectives of mathematics for grades three to six, the curriculum states that pupils, "familiarise themselves with probability in everyday situations by concluding whether an event is impossible, possible, or certain" (Finnish National Board of Education, 2016a, p. 254). Mention of *everyday situations* demonstrates a specific application of mathematics in particular areas of the content's curriculum; however, *everyday situations* also

assumes a particular degree of social or cultural capital. If students are not familiar with the norms of the local society or culture, then the relevance or familiarity that is implied with the application of *everyday situations* may not facilitate the same degree of functionality as it would for a student who is familiar with the *everyday situations* that are being posed.

This view also provides insight into a culturally established perception that a purpose of education, and mathematics, is to prepare students to participate in a broader social context. Such a perspective provides rationale for the curriculum's mention that, "pupils participate in the planning, development and evaluation of the activities in accordance with their developmental stage. They get experiences of being heard and appreciated as community members" (Finnish National Board of Education, 2016a, p. 29). Noting students are involved in *the planning, development and evaluation of activities* highlights the fully encompassing role that students are encouraged to engage in within their education. The phrase *in accordance with their developmental stage* demonstrates the curriculum's cognizance of establishing age-appropriate roles and expectations. Familiarizing students with *being heard and appreciated as community members* exemplifies democratic intents, and it also reiterates the curriculum's view of students as members of a broader context or community. The mathematics curriculum for all grade levels reiterates this point when it states that, "The instruction guides the pupils to understand the usefulness of mathematics in their own lives and more broadly in the society" (Finnish National Board of Education, 2016a, p. 137, p. 252, and p. 402). In this statement, the mathematics curriculum is remaining cognizant of students' connection to *the society*, but the statement also alludes to a degree of personalization in the mathematics instruction with the phrase *in their own lives*; additionally, the statement conveys a perception that mathematics is a form of capital that supports students in their participation *more broadly in the society* when it describes *the*

usefulness of mathematics. While this statement aligns with prior awareness of students' place in a larger context, it also reveals a perception of mathematics as capital. When discussing mathematics in the upper secondary curriculum, the text also reveals students' influence in the planning and instructional selections when it notes that, "The teaching and learning is founded on topics and phenomena of interest for the students as well as on problems related to them" (Finnish National Board of Education, 2016b, p. 138). As with the basic core curriculum, this statement demonstrates an intent to make mathematics relevant and applicable to students when it mentions the inclusion of *problems related to them*. Additionally, the curriculum notes that *topics and phenomena of interest for the student* are implemented in mathematics instruction, but by also noting that *teaching and learning is founded* on these topics signifies the degree to which students' voice and participation are valued in both the planning and implementation of mathematics instruction.

Chapter five includes a subsection that is specifically dedicated to discussion of *Pupil's participation* as indicated by its title. Within this subsection, pupil's participation in the development and planning of activities is described as the driving force behind the organization of educational activities and work. The education provider is responsible for ensuring that students have the opportunity to be involved in curriculum work and school rules. Students' involvement is described as a way to facilitate participation, cooperation, and familiarity with democratic practices. As per the Basic Education Act, schools must have a student council that promotes students' active involvement; this entity is another practice that instills democratic processes in students' educational participation. "The task of the council is to promote joint action, involvement and participation of the pupils. It inspires the pupils to put forward their opinions, be active and become involved in issues that concern them and their community"

(Finnish National Board of Education, 2016a, p. 37). This statement echoes previously stated educational intents. The repeated use of words and phrases, such as *joint action, involvement, be active, and become involved*, reinforces a message and a focus upon students participating in an *active and involved* way. The curriculum's text emphasizes practices that encourage students to embody the educational and societal action and not merely observe. This notion aligns with the curricular processes that include students in the planning and developing instruction. In this role, students are not simply receiving instruction, but instead students' thoughts, actions, and way of being are infused within the instruction.

This practice of fully involving students carries over into students' involvement in evaluation and assessment practices. With regards to assessment, the curriculum uncovers various practices that are driven by an intent to maintain students' consistent and active participation in their educational progression. "For most part, assessment takes place in interaction between the teacher and pupils" (Finnish National Board of Education, 2016a, p. 49). By describing the assessment process as an *interaction*, the text reveals the reciprocal nature of assessment, and it also signifies a shared role *between the teacher and pupils*. Such a dynamic is also indicative of the positioning that exists between the teacher and student; while this description does not necessarily signify that teachers and pupils possess the same degree of power in the assessment process, it does suggest attempts to lessen the degree of power that one party may possess over the other. For grades one and two, the mathematics curriculum states that, "The pupils are guided to notice their own progress" (Finnish National Board of Education, 2016a, p. 139). At grades three to six and seven to nine, the mathematics curriculum notes that, "The pupils are guided to assess their products and actions" (Finnish National Board of Education, 2016a, p. 255, 406). This demonstrates an intentional attempt to include students in

the assessment process even at the earliest stages of their mathematics learning, and it demonstrates that students' observation and evaluation of their own mathematics learning is embedded into mathematics instructional practices at each stage of their education. Throughout chapter six of the basic curriculum, multiples statements reiterate the interactive role that students have: "Both the pupils themselves and their guardians are informed at sufficiently frequent intervals" (Finnish National Board of Education, 2016a, p. 49), "The pupils and guardians are entitled to be informed of the assessment criteria" (Finnish National Board of Education, 2016a, p. 49), and "The teachers ensure that the pupils are aware of the objectives and assessment criteria" (Finnish National Board of Education, 2016a, p. 50). An overarching message in each of these statements pertains to sustaining students' awareness and guaranteeing that students are informed. Also, in each of the three statements, the choice of language conveys an assurance of students' participation; phrases such as *informed sufficiently*, *entitled to be informed*, and *teachers ensure* assert students' active inclusion throughout the evaluation process and assume a reciprocal role among teachers and students.

Learning plans are an instructional tool to support a student's learning and/or attendance. In the process of drafting this plan, the curriculum notes that, "The pupil's involvement in the planning increases as he or she progresses towards the higher grades of basic education" (Finnish National Board of Education, 2016a, p. 67). While this statement clarifies that the extent of a student's involvement *increases as he or she progresses towards the higher grades*, it also implies that *the pupil's involvement* is an assumed facet of the learning plan process whether to a lesser or greater degree (depending on age/grade). Additionally, when describing the factors that necessary for a learning plan, the following phrases are indicative of students' active role: "the pupil's views of his or her goals and interests" (Finnish National Board of Education, 2016a, p.

68), “the pupil’s goals related to learning, working and interaction skills and school attendance (Finnish National Board of Education, 2016a, p. 68), “cooperation with the pupil and the guardian” (Finnish National Board of Education, 2016a, p. 68), and “pupil’s self-assessment” (Finnish National Board of Education, 2016a, p. 68). Respectively, each of these phrases incorporates the student’s perspective, ambitions, collaborative contribution, and/or self-evaluation, which contribute to the construction of their learning plan. This again highlights students’ integral role, not only in the execution of instructional practices but also their role in the foundational processes.

Chapter seven of the basic core curriculum describes remedial teaching, which is a more minimal and short-term learning intervention. Remedial teaching includes differentiated assignments, materials, and instructional methods. It also can include guidance supports and support with time management. The curriculum notes that, “The initiative in providing remedial teaching to a pupil comes primarily from the teacher, but it may also come from the pupil or the guardian” (Finnish National Board of Education, 2016a, p. 77). Mention that remedial practices *primarily come from the teacher* indicates that it is typically the teacher who initiates this implementation; however, the clause *but it may also from the pupil or parent* signifies that the procedures surrounding remedial teaching allow for students and parents to enact similar authorizations in the initiation of such a practice. This allowance distributes capital, as it relates to remedial teaching, in a more equitable manner and frames the role of the teacher, student, and parent in a more fluid way. With regards to remedial teaching, the curriculum also states that, “Remedial teaching should be provided in mutual understanding between the school, the pupil, and the guardian” (Finnish National Board of Education, 2016a, p. 77), and subsequent text states that, “They are also informed about the pupil’s duty to attend remedial teaching organised

for him or her” (2016a, p. 77) These quote demonstrate the collaborative nature that is perceived in remedial teaching processes; mention of *mutual understanding* demonstrates the joint role that is dispersed among the teacher, student, and guardian. Use of the collective pronoun *they* references the teacher, student, and guardian(s) as a collaborative entity in the remedial process. Additionally, the latter statement’s mention of *the pupil’s duty* places a particular weight upon the student to fulfill his or her responsibility; this phrase illuminates a societal expectation and accountability that extends beyond the teacher to include the student who is perceived to be at the crux of this particular practice’s effectiveness.

The curriculum’s discussion of pupil welfare exemplifies the active participation that is facilitated through educational processes. The fourth section of chapter eight of the basic core curriculum notes that, “An opportunity should be provided for the pupils to participate in the preparation of the curriculum and the relevant plans, and the school rules” (Finnish National Board of Education, 2016a, p. 85). First, noting that students *should be provided* this opportunity frames this practice as a mandate as opposed to an option. Allowing students *to participate in the preparation of the curriculum, the relevant plans, and the school rules* demonstrates the extensive inclusion of students that the curriculum grants. With regards to mathematics, the curriculum notes that, “The pupils shall have opportunities for influencing the choice of working approaches” (Finnish National Board of Education, 2016a, p. 405). This exemplifies a particular instance where students contribute to and participate in the preparation of the mathematics plans. To further stress the enforcement of this active participation, the curriculum requires that, “The pupil council in the school shall be heard before confirming these plans and regulations” (Finnish National Board of Education, 2016a, p. 85). Again, the use of *shall be* does not frame this process as a choice, but instead as a mandate. The notion of ensuring that students are *heard* is a

recurrent practice that was previously identified in discussion of both individual pupil welfare and school culture. This contingency that students must be *heard* prior to *confirming these plans and regulations* imparts a degree of power upon students' voice and students' participation. The implementation of educational structures and processes, such as the pupil council and its role in the approval process, represent the curriculum's democratic habitus.

Roles. Individual roles, with cognizance of their context of the greater educational community, are decipherable through various descriptions in the basic core curriculum. The curriculum notes that "A community with language-awareness discusses attitudes towards languages and linguistic communities and understands the key importance of language for learning, interaction and cooperation and for the building of identities and socialisation" (Finnish National Board of Education, 2016a, p. 29). The *attitudes towards language* alludes to a recognition of the habitus that influences language in learning. Phrases, such as *linguistic communities*, *interaction*, and *socialization* demonstrates a cultural perception of the cooperative nature of language and its function as the interface to learning and collaborating. This perception of language is partnered with the teacher's role as the exemplar of language and the individual who projects the *way* to implement language. The curriculum notes that, "In a language-aware school, each adult is a linguistic model and also a teacher of the language typical of the subject he or she teaches" (Finnish National Board of Education, 2016a, p. 29). Noting that the teacher is the *linguistic model for the subject he or she teaches* suggests that each subject is its own field, and the description of *the language typical of the subject* indicates that each field, or subject, possesses its own habitus. A teacher's role is perceived to include the responsibility of exemplifying the spoken and written language *and* the minutia of the language of the content area that is being taught; this statement holds implications with regards to planning and

instruction as each of these processes must consider how information is presented to students. The curriculum acknowledges this notion when it states that, “Each subject has its own language, textual practices and concepts” (2016a, p. 29).

A subsection in chapter five titled *Internal cooperation and cooperation with other parties* assumes colleagues’ collaboration within schools and among schools. When identifying particular instructional practices, the curriculum also reveals associated perceptions related to these practices: “Cooperation between adults, including collaborative teaching, also works as a model for the school’s activities as a learning community for the pupils” (Finnish National Board of Education, 2016a, p. 38). This statement identifies the practice of *cooperation between adults* as a mechanism to be mirrored within the larger school context. The use of the phrase, *cooperation between adults*, conveys a perception that this *cooperation* is the way that the *school’s activities* should be conducted, and it reveals habitus that is being promoted. Additionally, the use of *adults*, as opposed to *teachers* or *staff* implies the extension of this *cooperation between adults* to include individuals beyond just school personnel. Another instance where *cooperation* is an assumed function of staff is when the curriculum notes that, “Close cooperation among the staff facilitates the implementation of the school’s educational goals” (Finnish National Board of Education, 2016a, p. 38). This statement again frames *cooperation* as an instrument that enables action and activity with the phrase *facilitates the implementation*.

Within this same subsection, schools are encouraged to cooperate with one another “with the aim of promoting the development and coherence of instruction and reinforcing staff competence” (Finnish National Board of Education, 2016a, p. 38). This statement suggests that cooperation not only possesses instructional benefits, but with mention of *reinforcing staff*

competence, collaboration is also perceived to contribute to individual proficiencies; reference to *reinforcing staff competence* also indicates a growth mindset where improvement and progression are recurring processes. Lastly, cooperation is encouraged for extracurricular activities, and the curriculum promotes school's collaboration with actors in the surrounding community. The curriculum notes:

Cooperation with the youth, library, sport and cultural services, the police and parishes, various organisations, companies and other actors in the local area, including nature schools, museums and youth centres, adds to the versatility of learning environments and supports the school's educational task (Finnish National Board of Education, 2016a, p. 38).

This text epitomizes the extent to which cooperation is promoted within and beyond the Finnish school setting. Education and instruction is perceived to stretch outside of the classroom and beyond the school community to encompass multiple legal, religious, and social facets. One particular feature of this quote, which may be indicative of social dynamics, is the pairing of particular entities with one another in the listing of involved parties. Each entity is not simply listed individually, but instead, some actors are listed as a set. For example, the text pairs *the police and parishes, companies and other actors in the local area*, and *museums and youth centre* together. These pairings may also be grouped according to the type of support or collaboration that they contribute; however, this nuanced aspect of cooperation is not specified within the curriculum. Additionally, the sequencing of each of these actors is possibly indicative of either the degree to which these entities collaborate with schools and students or the positioning within the educational context or field.

In chapter seven of the basic core curriculum, the text hones in upon perceived roles of both teachers and assistants, as well as their collaborative dynamic: “The teachers and the assistants plan and assess their work together and, when needed, with other school staff members. A clear division of labour and responsibilities is vital” (Finnish National Board of Education, 2016a, p. 78). The cooperation among teachers and assistants is evident with mention that they *plan and assess their work together*, and the curriculum also notes that in some instances this cooperation may extend to *other school staff members*. The subsequent statement clarifies that the intertwining nature of teachers’ and assistants’ roles must also be parsed out when it notes that *a clear division of labour... is vital*. This latter statement indicates that collaboration is perceived to be necessary, but it also emphasizes a need to designate responsibility to each individual position in order to facilitate a functional learning community. A similar role for students is perceptible within the mathematics curriculum for grades seven to nine; the curriculum states, “When working together, each pupil works for the good of both himself or herself and the group” (Finnish National Board of Education, 2016a, p. 405). In this collaborative scenario, an assumed expectation is that students will act and contribute for the betterment of not just themselves, but also their group. This notion of micro (individual) and macro (community) considerations is reiterated in this same subsection when the curriculum defines the teacher’s role: “The teacher’s task is to plan, instruct, support and assess the learning and work approach of both individual pupils and the entire group” (Finnish National Board of Education, 2016a, p. 78). The responsibilities *to plan, instruct, support and assess* provides a somewhat broad and open-ended description of the enforced role of a teacher. Yet, the use of *support* indicates a nurturing quality and the inclusion of the three responsibilities *to plan, instruct, and assess* suggests an intent for a role that is fully encompassing and facilitates a

coherent and collaborative educational process. Additionally, the teacher's role to evaluate *both individual pupils and the entire group* underscores consideration of each individual student, and the individual student's role as part of a whole community. This pairing of an individual with mention of community is dispersed throughout the basic core curriculum.

Within the mathematics chapters of the basic core curriculum, the assumed role of teachers and students is evidence through the instructional goals displayed in curricular charts titled *Objectives of instruction in mathematics in grades, 1-2, 3-6, or 7-9* respectively. Within each of these charts, subheadings include "Significance, values and attitudes" (Finnish National Board of Education, 2016a, p. 137, 252, 403), "Working skills" (Finnish National Board of Education, 2016a, p. 137, 252, 403), and "Conceptual objectives and objectives specific to the field of knowledge" (Finnish National Board of Education, 2016a, p. 137, 252, 403). Each of these three grade intervals share the same chart title, they share the same subheadings, and they also exhibit some instructional commonalities; however, nuances within these objectives demonstrate that though instruction is provided in the same content area of mathematics, each grade interval embodies its own distinct *field* with actors, both students and teachers, who possess their own distinct *habitus*. An initial observation when viewing each chart is the increasing number of objectives with the progression of each grade interval; grades one to two contains twelve objectives, grades three to six includes fourteen objectives, and grades seven to nine jumps to twenty objectives. This difference in quantity is suggestive of the progressing expectation and the increasingly mathematics-related demands that is addressed at each of these grade intervals.

When listing the mathematics objectives, each is stated as a phrase as opposed to a complete sentence. With this format, repeated patterns are evident in the objectives, and they

disclose expected roles of both teachers and students across all grades of the mathematics basic core content. At each of the three grade intervals (1-2, 3-6, and 7-9), the phrases *to support the pupil*, *to guide the pupil*, and *to encourage the pupil* are repeatedly used. Each of these phrases are indicative of the teachers' assumed role, which is *to support*, *to guide*, and *to encourage* pupils with their participation in the mathematics content and mathematics working skills. Yet, while these objectives reveal the role of teacher as they pertain to mathematics, they simultaneously disclose the role of students. Following this initial action *to support*, *to guide*, and *to encourage*, the objectives identify a particular concept or practice that is part of the instructional objective. For example, one of the working skills objectives for grades seven to nine states an intent "to encourage the pupil to develop his or her verbal and written mathematical expression" (Finnish National Board of Education, 2016a, p. 403). The first portion of this objective *to encourage the pupil* is indicative of the teachers' role; the second half of this objective *to develop his or her verbal and written mathematical expression* conveys the anticipated role, or action, of the student.

As previously stated *to support*, *to guide*, and *to encourage* are actions that were frequently associated with teachers' role in the mathematics objectives; however, within each grade interval, there were also unique, and expected, actions that were both notable and indicative of the *field* in which each grade interval was set. For grades one to two, a distinct action that was cited in the objectives was *to familiarise*. This intended role of the teacher fits appropriately for these initial years of education; at grades one and two teachers are introducing students to mathematics content, and students are being exposed to novel mathematics concepts. The use of *to familiarize* conveys a unique habitus that only exists in the initial phases of mathematics learning where students perceive the content as new and unfamiliar.

For grades three to six, two different actions are assumed as roles of teachers: *to maintain* and *to inspire*. The positioning of these two teacher roles is also representative of their place in the mathematics progression for grades three to six. *To maintain* is used within the first mathematics objective for this grade interval, and it states an intent, “to maintain the pupil’s enthusiasm for and interest in mathematics and to support a positive self-image and self-confidence” (Finnish National Board of Education, 2016a, p. 252). The positioning of grades three to six is one that is set between the introduction of novel concepts (grades 1-2) but also leads to higher level mathematics content (grades 7-9); therefore, the curriculum for grades three to six warrants teachers’ action *to maintain*; coinciding with the teachers’ role of maintenance, students are expected to sustain their *enthusiasm for and interest in mathematics* as the content area is one that is now familiar but also still at an early stage. The final objective in this grade interval states an intent, “to inspire the pupil to formulate instructions in the form of computer programs in graphic programming environments” (Finnish National Board of Education, 2016a, p. 253). Positioning this objective as the last, suggests that this objective may pertain to the latter grades of this three to six grade interval. Additionally, while teachers are expected *to inspire*, students are expected *to be inspired* and *to formulate*. This objective signifies the initiation of higher level mathematics activities and practices that challenges students in their application of mathematics. The objectives of the seven to nine mathematics content continue to reiterate teachers’ roles *to support*, *to guide*, and *to encourage*; however, one additional expectation is the role *to strengthen*. This action aligns with the grade level interval and demonstrates a recognition that values, attitudes, working skills, and mathematics competencies have already been introduced and established; at this stage, these practices require bolstering, and more challenging mathematics content and approaches are initiated at this stage of students’ mathematics

acquisition. This is evidenced within grades seven to nine when the curriculum states that, “The pupils are supported in perceiving large and complex issues and discovering connections” (Finnish National Board of Education, 2016a, p. 405). While a nurturing component is maintained with use of the word *supported*, phrases such as, *large and complex issues* and *discovering connections* convey an intricacy that was not present in the mathematics curriculum at prior grade level intervals. Though subtle, the nuances within the objectives highlight the distinctive roles that manifest within each of the grade level, mathematics fields.

Open and embracing. This democratic *way* transpires through multiple perspectives emphasized within the curriculum. The text conveys not only an acceptance of diversity, but it demonstrates an encouragement of and an embracing of diversity. When describing a school’s learning community, it states that, “The community appreciates and draws upon the country’s cultural heritage and national languages as well as cultural, linguistic, religious and philosophical diversity in the community itself and in its environment” (Finnish National Board of Education, 2016a, p. 29). This statement is twofold; first the opening phrase *draws upon the country’s cultural heritage and national languages* indicates a preference towards the nation’s historical traditions and the predominant national languages. In this instance, a particular nationalistic habitus is portrayed and a particular way of thinking and being within the educational context is promoted; this mindset invites capital into the school culture and school community. However, subsequent phrases counter this tendency when it notes an appreciation for *cultural, linguistic, religious and philosophical diversity*. The verbs *appreciates* and *draws* indicate that there is not just a tolerance for diversity but there is a promotion and support for diversity and varying perspectives. This unbiased habitus is expected among teachers and other members of a school community. “The staff’s open-minded and respectful attitude towards different religions, views,

traditions and conceptions of education lays the foundation for constructive interaction” (Finnish National Board of Education, 2016a, p. 15). Words such as *open-minded* and phrases such as *respectful attitudes towards* indicate an expectation that individuals possess an open approach in their way of acting but also in their way of thinking. This statement begins by addressing openness to individual characteristics such as one’s *religions, views, and traditions*; yet, the statement then makes a direct connection to educational practices and ways of interacting with its expected openness to *conceptions of education*, which it believes *lays the foundation for constructive interaction*. This statement exemplifies the curriculum’s recognition that social perspectives infiltrate educational practices and contribute to students’ ways of engaging in their learning.

Within a subsection of chapter three of the basic core curriculum, *Thinking and learning to learn*, the text states that, “pupils are guided to realise that information may be constructed in many ways” (Finnish National Board of Education, 2016a, p. 21). By noting that *pupils are guided* the curriculum is revealing an instructional practice and an intent to facilitate students’ openness to various approaches with its belief *that information may be constructed in many ways*. This pedagogical and instructional approach reflects a broader societal approach of embracing various social and cultural perspectives, and it is one that is evident within mathematics instruction. When discussing a key content area of mathematics, *thinking skills*, the curriculum states that, “They practise examining mathematical situations from different viewpoints” (Finnish National Board of Education, 2016a, p. 137). This statement is made within the mathematics curriculum for grades one to two, and inclusion of this instructional practice demonstrates that *different viewpoints* are encouraged at an early stage of mathematics instruction. With this instructional *way*, the curriculum reiterates the expected role of teachers

and the perception that, “It is crucial that the teachers encourage their pupils to trust themselves and their views while being open to new solutions” (Finnish National Board of Education, 2016a, p. 21). This statement addresses two aspects of openness to multiple perspectives. The phrase *encourage their pupils to trust themselves and their views* indicates an openness and respect for individuals’ own personal beliefs and values, and it encourages staff to allow students to enact their beliefs and values within an educational context. Additionally, by encouraging students to be *open to new solutions*, the curriculum is also promoting instructional practices that foster students’ reception of and impartiality towards various ways of thinking and acting.

Shortly after this, the curriculum reiterates that, “The pupils are guided to consider things from different viewpoints, to seek new information and to use it as a basis for reviewing the way they think” (Finnish National Board of Education, 2016a, p. 21). This statement again relays a progressive outlook as it relates to instructional practices. By noting that students are *guided to consider things from different viewpoints*, the text is encouraging practices that facilitate examination of content in multiple ways. The phrase *to seek new information* suggests an exploratory nature to educational approaches; *as a basis for reviewing the way they think* signifies not only self-reflective components to instruction, but it also reveals the rationale and objectives that underlie the consideration of various perspectives. Additionally, *the way they think* indicates an openness to alternate approaches and a perception that learning entails individuals’ ability to shift their way of thinking. This perception of learning manifests through various practices including, pupils’ abilities to, “develop their social skills and learn to express themselves in different ways and present and perform publicly in various situations” (Finnish National Board of Education, 2016a, p. 22). In contrast to previous discussion, which encouraged students’ open *reception* to various content, views, and ways of being, this instructional practice

encourages versatility in students' *expression*; this is identifiable with use of phrases that encourage students to *develop their social skills, learn to express themselves, and present and perform*. The curriculum connects this versatility in instruction, specifically to mathematics, when it notes that, "It is equally important to learn to use mathematical symbols, images and other visual expression" (Finnish National Board of Education, 2016a, p. 22). This inclusion of alternate modes of demonstrates a versatility in the methods of communication, the utilization of various symbolic tools, and an unrestricted perception of what language encompasses. Here, *mathematics symbols* are discussed as a mode of communication and a tool for students to apply in their individual expression and performance. When discussing the *Operating culture of comprehensive basic education* in chapter four, the curriculum addresses the versatility of working approaches within its school culture. "A learning community recognises the diversity of learning and building of knowledge and operates flexibly" (Finnish National Board of Education, 2016a, p. 28). By describing the *diversity of learning and building knowledge*, the curriculum is describing the actions associated with knowledge acquisition, and in doing so, it is demonstrating a recognition of the variability of the process of learning.

This perspective provides explanation for the approaches that are emphasized and restated through the basic core curriculum, and this perspective dictates the ways in which educational practices are executed and the ways in which an educational atmosphere is established. For example, when discussing instructional approaches for mathematics for grades one to two, the curriculum states that, "The pupils' level of understanding of mathematics as well as their achievement in it can be assessed through their spoken and written work and their use of different tools and drawings" (Finnish National Board of Education, 2016a, p. 139). This description exemplifies the diversity that is integrated into mathematics practices with mention

of assessment *through their spoken and written work*; this phrase indicates an openness to different forms of mathematics expression, and the application of *different tools and drawings* is indicative of versatility in mathematical approaches to obtaining solutions. Within chapter five of the secondary curriculum's descriptions of mathematics, it reiterates a similar openness to variations in mathematics practices: "Varying working methods are used in the instruction, allowing the students to work independently and together with others" (Finnish National Board of Education, 2016b, p.138). In addition to acknowledging the use of *varying working methods*, the curriculum identifies variations in students individual or collective interactions with mathematics when it notes, *allowing students to work independently and together with others*. The sequencing and structuring of this statement also indicates that the *varying working methods* facilitate the flexibility in students' grouping—whether individually or collaboratively.

The upper secondary curriculum identifies, "familiarising him or her with the versatile meanings of mathematics to people and the society and its unique and fascinating nature as a field of science" (Finnish National Board of Education, 2016b, p. 139) as a way to capture students' interest in mathematics. In this instance, the phrase *versatile meanings* is referencing students' individual internalizations of mathematics, and it is recognizing that mathematics' meaning, and its functioning, will vary for each individual when it notes *to people and the society*. Additionally, "The learning environments must offer possibilities for creative solutions and the exploration of phenomena from different perspectives" (Finnish National Board of Education, 2016a, p. 30). In multiple instances, the notion of *different perspectives* is preceded by or followed by discussion of creativity or *creative solutions*. This recurring partnership of these concepts indicates a curricular perception that these two components are intertwined with one another. When discussing the *conception of learning* in chapter three, it states that,

“Learning together promotes the pupils’ skills in creative and critical thinking and problem-solving and their ability to understand different viewpoints” (Finnish National Board of Education, 2016a, p. 17), and when describing philosophies related to *thinking and learning*, it states that, “A precondition for finding innovative answers is that the pupils learn to see alternatives and combine perspectives open-mindedly and are able to think outside the box” (Finnish National Board of Education, 2016a, p. 22). Each of the two latter statements exhibit the interconnectedness of creativity and multiple perspectives, yet, when dissecting each further, they hold additional implications. The sequencing of first suggests that *creativity* lends itself to one’s *ability to understand different viewpoints*, while the second contrastingly suggests that one’s *ability to see alternatives and combine perspectives open-mindedly* serves as a *precondition for finding innovative answers*. This bidirectional discussion of creativity and open-mindedness highlights the interdependence that is perceived to exist among these two instructional characteristics. It is indicative of an educational mindset that influences educational practices and actions; each characteristic (creativity and open-mindedness) is understood as both a means to the other’s end, and therefore, with such a dynamic, each characteristic is also pursuit of the basic core curriculum.

Individuality through creativity. When examining the function of creativity within the curriculum, its context reveals three roles: it functions as an intended aim or outcome, it acts as a motivating instructional tool, and it is a way of being—both thinking and acting. The first role is evident when discussing the mission of education in chapter three, and more specifically, in the subsection titles *Cultural competence, interaction and self-expression*. The curriculum states that, “School work encourages the use of imagination and creativity” (Finnish National Board of Education, 2016a, p. 22-23). In this particular description, *imagination and creativity* are

identified as the intended outcomes and *school work* is envisioned to facilitate this *creativity*. Pairing *creativity* with *imagination* provides an implied meaning of *creativity* in this context and expresses an undertone of ingenuity and inventiveness in learning. When discussing differentiation within mathematics, the curriculum lists mathematics content that may be incorporated in instruction for “talented pupils” (Finnish National Board of Education, 2016a, p. 255) such as, “the properties of numbers, different number sequences, geometry, creative problem-solving, and applications of mathematics” (Finnish National Board of Education, 2016a, p. 255). In addition to specifically identifying that this content’s use for *talented students*, the curriculum indicates that *creative problem-solving* is perceived to be a higher-level skill. The listing of the various content areas seems to progress in its difficulty with highest-order content cited last. In this description, *creative problem-solving* appears just before the final content area, indicating that *creative problem solving* possesses greater demand. In another instance, when discussing multi-disciplinary learning modules and their aims, one particular goal in the application of these learning modules is, “giving space for intellectual curiosity, experiences and creativity and challenging the pupils to engage in many types of interaction and language use situations” (Finnish National Board of Education, 2016a, p. 33). In this particular instance, *intellectual curiosity, experiences, and creativity* are the identified goals when using learning modules. The phrase *giving space* signifies a perception that in order to attain this *curiosity, experiences, and creativity* a degree of freedom is required within students’ learning environments and instruction. Additionally, the subsequent description provides insight into perceptions of how this *curiosity, experiences, and creativity* is anticipated to manifest—through *many types of interaction and language use situations*. Within the introductory pages of the upper secondary curriculum’s discussion of mathematics, it states that, “The student is

encouraged to develop creative solutions to mathematical problems” (Finnish National Board of Education, 2016b, p. 138). Here, *creative solutions* are the intended outcome when students are present with *mathematical problems*. The word choice of *develop* indicates students participate in a process to work through and formulate their own solutions, which aligns with the establishment of *creative solutions*. Additionally, when discussing mathematics, the secondary curriculum notes that it is, “encouraging him or her towards experimentation, and developing his or her information acquisition processes” (Finnish National Board of Education, 2016b, p. 138). This reiterates the prior message which promotes students’ generation of novel solutions by fostering students’ *experimentation*. Reference to *his or her information acquisition processes* suggests that there is a degree of individuality in mathematics processes that requires students’ own attainment of mathematics knowledge.

A second perceived role of creativity is that of an instructional tool that inspires and motivates. When addressing *the conception of learning* within chapter two of the basic core curriculum, the text considers students’ attitude towards learning when it states, “Positive emotional experiences, the joy of learning and creative activities promote learning and inspire the pupils to develop their competence” (Finnish National Board of Education, 2016a, p. 17). In this statement, *positive emotional experiences* are linked to *creative activities*, which are perceived to be the types of instructional tools or activities that will foster students *joy of learning*. This cognizance of students’ emotions in their interactions with mathematics is evident in the secondary curriculum when discussing the objectives of the basic mathematics syllabus. One of the objectives states that a student, “learns to trust his or her own abilities, skills and thinking, and finds courage to engage in experimental, inquiry-based, and inventive learning” (Finnish National Board of Education, 2016b, p. 145). By noting that a student *learns to trust his*

or her own abilities, the curriculum is demonstrating an awareness of and perception that students' inclinations towards mathematics influences their thinking and way of engaging in mathematics through creative practices, such as *experimental, inquiry-based and inventive learning*.

Within chapter three when discussing *thinking and learning to learn*, the curriculum identifies, "Playing, gameful learning and physical activities, experimental approaches and other functional working approaches and various art forms promote the joy of learning and reinforce capabilities for creative thinking and perception" (Finnish National Board of Education, 2016a, p. 22). This text demonstrates a recurring association of *creativity* with students' *joy of learning*, and its use of *playing, gameful learning*, and *experimental* reiterates imaginative and flexible approach. In this particular statement, *creativity* is perceived to be an intended outcome of this approach, but the motivational activities that are mentioned in order to foster this outcome provide insight into the perceived meaning of *creativity* through the curricular lens. When discussing the working methods associated with mathematics for grades one and two, the curriculum notes that, "Key working methods include different types of pedagogically guided play and games" (Finnish National Board of Education, 2016a, p. 138). For grades three to six, the mathematics curriculum identifies that, "Learning games and play form an important and motivating working method" (Finnish National Board of Education, 2016a, p. 254) Finally, with discussion of working methods, the curriculum notes that, "Versatile working methods bring the pupils joy of learning and experiences of success and support creative activities characteristic of different age groups" (Finnish National Board of Education, 2016a, p. 31). *Joy of learning* and *creative* activities are once again paired together, which indicates a recurring association of *creativity* with students' enjoyment of learning and inspiration to learn. This is again evidence

within the instructional objectives of mathematics for grades one to two; within the first subheading titled, *Significance, values, and attitudes*, the first and only objective states an intent, “to support the pupil’s enthusiasm for and interest in mathematics” (Finnish National Board of Education, 2016a, p. 137). This message is reiterated in the mathematics descriptions for grades three to six and seven to nine when it states, “The instruction supports a positive attitude towards mathematics in the pupils” (Finnish National Board of Education, 2016a, p. 252 and 402). This motivational approach to learning activities through *creative* activity leads to the final and most predominant role that *creativity* embodies within the basic core curriculum.

At many points within the curriculum, creativity is cited, and encouraged, as a *way* of thinking and *way* of acting. When discussing a learning community, the curriculum notes that, “it encourages experimentation and gives space for active learning, creative work, physical activity, play and experiences that are characteristic of various ages and different learners” (Finnish National Board of Education, 2016a, p. 28). This statement presents *creative work* as an intended outcome of instruction, and *creative* is used to describe the way in which students are encouraged to *work* or act. As with previous statements, the curriculum promotes settings that *give space* for students to demonstrate *creative work*. This freedom and the incorporation of *play* is again perceived as an approach that facilitates this *creative* way of working. A similar statement is made in chapter four when discussing working methods: “An exploratory and problem-centred work approach, play, use of imagination and artistic activities promote conceptual and methodological competence, critical and creative thinking, and skills in applying one’s competence” (Finnish National Board of Education, 2016a, p. 32). In this statement, the text conveys similar philosophies surrounding *creativity* with its use of words, such as *exploratory*, *play*, and *imagination*; their repeated use, in conjunction with creativity, signifies

instructional characteristics that are perceived to enable *creative thinking*; this notion of *creative thinking* is again apparent when the curriculum states that, “Pupils are encouraged to grasp new opportunities with an open mind and to act flexibly and creatively when faced with change” (Finnish National Board of Education, 2016a, p. 25). Noting that students are *encouraged to grasp new opportunities with an open mind*, reiterates the curriculum’s connection of creativity to open mindedness, and it suggests that this open mindset will enable students to *act flexibly and creatively*. This promotion of acting creatively demonstrates the curriculum’s intent to instill *creativity* in students *thinking* and *actions*. With regards to mathematics, creativity is a recurring message relayed at all three grade intervals; the mathematics curriculum chapters, encourage *creative thinking* in the first sentences of each of the three chapters for grades one to two, three to six, and seven to nine, when addressing the *Task of the subject*; the curriculum states that, “The task of the subject of mathematics is to support the development of the pupils’ logical, precise, and creative mathematical thinking” (Finnish National Board of Education, 2016a, p. 136, 252, 402). Identifying *logical, precise and creative* in conjunction with *mathematics* illustrates the *way* in which mathematics is approached within the Finnish curriculum. In this series of descriptor, *creative* counteracts the appeal for a *logical, precise* way of thinking but its inclusion demonstrates is perceived necessity within mathematics approaches. The repetition of this statement at each of the three grade intervals demonstrates that *creativity* is a consistent component at all stages of mathematics instruction.

Reflection, Resilience and Lifelong Learning

Reflection. Another practice that is promoted and guides students’ *way* of thinking and influences educational entities’ *way* of acting is the promotion of reflection in both instructional practices and in educational processes. Early in the curriculum, in chapter two, when discussing

the underlying values of basic education, the curriculum identifies reflection as a beneficial practice that is applied not only by students, but by other actors who participate in students' education and growth: "The joint reflection of school and homes on values, and cooperation underpinned by this, promote security and the pupils' holistic well-being" (Finnish National Board of Education, 2016a, p. 15). Within this reflective process, the curriculum is identifying the necessity of *cooperation* which its direct mention of this *joint* practice involves collaboration among the two primary entities involved in a student's learning—the *school and homes*. In this particular instance *reflection* is perceived to be a practice that fosters *security and pupils' holistic well-being*. This reflection is encouraged with discussion of issues that are decided at the local level. The curriculum states that, "Reflection on the principles that guide the development of school culture is a key part of the curriculum work, while it also is a factor that promotes continuous improvement" (Finnish National Board of Education, 2016a, p. 34). Here, *reflection* is described as an essential component of education processes, and when the text notes that it *is a key part of curriculum work*, this phrase denotes that reflection is a practice that influences the activity surrounding the development of curriculum. Additionally, describing *reflection as a factor that promotes continuous improvement* indicates the constructive nature of curriculum and education; the inclusion of this phrase signifies a progressive mindset in the Finnish educational culture, and this aligns with prior discussions related to flexibility and openness to diversity and versatility. Use of *continuous improvements* reveals an intent for constant evolution of educational practices and processes and *reflection* is perceived to be a precursor to this improvement.

This reflection within the educational systems trickles down to instructional practices within the classroom that encourage students' own reflection in their learning and in their lives.

For example, when discussing *the conception of learning* in the third section of chapter two, the curriculum notes that, “Language, physical elements and the use of different senses are essential for thinking and learning. While acquiring new knowledge and skills, the pupils learn to reflect on their learning, experiences and emotions” (Finnish National Board of Education, 2016a, p. 17). The first sentence describes potential components of a student’s acquisition of knowledge when it lists *language, physical elements and the use of different senses*. Following this, the curriculum encourages instruction that allows students to *reflect on their learning*. By noting that students *learn to reflect*, the text is alluding to specific instruction being provided on the process of reflection. The conditional clause *while acquiring new knowledge* signifies that *reflection* is perceived to be especially relevant in educational opportunities where new content is being acquired, and by encouraging students to reflect not only upon their learning but also upon their *experiences and emotions*, the curriculum is adding a new dimension to the reflective process. This reflection upon working skills and emotion is reiterated in discussion of mathematics instruction for grades three to six and seven to nine; “The pupils are also guided to pay attention to their working practices and to become aware of their attitudes towards studying mathematics” (Finnish National Board of Education, 2016a, p. 255, 405). This statement encourages students’ reflection on *their working practices*, but within this statement, the curriculum also promotes students’ reflection upon *their attitudes towards studying mathematics*. The added consideration of *their attitudes towards mathematics* demonstrates a perception that students’ feeling *towards studying mathematics* have the potential to influence their performance and must be accounted for in reflective processes.

With regards to mathematics curriculum for grades three to six, instructional objectives related to students working skills states an intent, “to guide the pupil to develop his or her skills

in assessing whether the solution is reasonable and meaningful” (Finnish National Board of Education, 2016a, p. 252) and “to guide the pupil in estimating the magnitude of a measured object, selecting a suitable tool and unit for the measurement, and considering whether the result is reasonable” (Finnish National Board of Education, 2016a, p. 253). In each of these objectives related to mathematics content, the curriculum is requiring students to consider *whether the solution* or *whether the result is reasonable*. This practice of evaluating the obtained outcome exemplifies another application of reflective practices within the context of mathematics.

Within the curriculum’s discussion of assessment, *reflection* is frequently an embedded practice. The curriculum encourages instructional practices where students are, “reflecting on the objectives and examining their personal learning” (Finnish National Board of Education, 2016a, p. 50). This particular phrase is indicative not only of the process of learning, but also the perception of assessment and its process. In this statement, the curriculum encourages students to reflect on their *personal learning* process as opposed to reflecting on the outcome of an assessment; this reveals a perception that assessment is not a finite tool, but instead it is an ongoing process and reflection is a crucial component of this process. This point is reiterated in the discussion of mathematics instruction for grades one to two when it states that, “In addition to the correctness of the pupils’ solutions, it is also important to assess the pupils’ working processes and their fluency” (Finnish National Board of Education, 2016a, p. 139). This statement highlights that the solution is not the ultimate focus; instead, *the pupils’ working processes and their fluency* are also perceived to be vital components of the learning and reflective process.

With regard to self-assessment, the curriculum states that, “Education develops the pupils’ capacity for self-assessment by giving space for reflecting on their learning and progress

and by developing self-assessment skills” (Finnish National Board of Education, 2016a, p. 51). This statement reiterates a similar message. Use of the word *capability* demonstrates that reflection, and the ability to reflect, is an emphasized skill that enhances students *learning and progress*. Repeated mention of *self-assessment* both prior to and following reference to *reflection* suggests that *reflection* is perceived to enable students’ ability to self-assessment. In discussion of mathematics assessments for grades one to two, the curriculum notes that, “the pupils are encouraged to maintain their strengths and practise their emerging skills” (Finnish National Board of Education, 2016a, p. 139). Similarly, for grades three to six, the curriculum states that, “The pupils are guided to assess their own learning and to become aware of their strengths” (Finnish National Board of Education, 2016a, p. 255). These statements convey an intention to facilitate both independence and metacognition in students’ mathematics learning and abilities. The phrases *encouraged to maintain their strengths* and *guided to assess their own learning* highlights the emphasis upon students’ individual identification of *their* mathematics learning; the repeated use of *their strengths* and mention of *emerging skills* exhibits students an intention to facilitate students’ mathematics progression through the application of reflective, learning processes.

Lastly, assessment and reflection are used in conjunction with one another when addressing students’ working skills: “The pupils are also guided in reflecting on the progress of their plans and in assessing the success of their work and the factors that affected it” (Finnish National Board of Education, 2016a, p. 52). This statement identifies three primary areas upon which to reflect: *progress of their plans*, *success of their work*, and *factors that affected it*. Both the sequence and inclusion of these three factors, demonstrates extent to which *reflection* is expected to be applied within the learning process; mention of these factors encourages students’

reflection on their preparation and execution, and in addition to this, a metacognitive component is again incorporated with reflection upon the *factors that affected it*. In each of the instances above, reflection is perceived to be a tool that contributes to and emphasizes students' awareness of their process of learning.

Lastly, reflection is not an instructional tool that is perceived that only benefits and steers the practices of students; reflection is also a component that is an encouraged tool for educators. This is evident when the curriculum notes that, "For teachers, assessment is also an instrument of self-assessment and means of reflecting on their own work. Information obtained through assessment helps teachers to adapt their instruction to the pupils' needs" (Finnish National Board of Education, 2016a, p. 49). This statement provides insight into both assessment and reflection and reiterates the perceived interconnectedness of the two. The phrase, *a means of reflecting*, suggests that assessment is an approach to the intended goal which is reflection. The subsequent sentence, which notes this process *helps teachers to adapt their instruction* reiterates a role of reflection that was previously identified; in this statement, reflection is perceived as contributing to the evolution of educational processes and acclimation to necessary changes based upon the outputs of reflection. The curriculum also states that, "The teacher selects working methods in interaction with the pupils and, in particular, guides the pupils in the use of new working methods, strengthening their ability for self-regulation" (Finnish National Board of Education, 2016a, p. 32). Noting that the process of selecting working methods occurs *in interaction with the pupils* and *guides the pupils* demonstrates the involvement of students in this process and the collaborative nature of this reflection on working methods for both students and teachers; additionally, mention of *self-regulation* indicates another underlying intent in the promotion of reflective practices. Use of *self-regulation* suggests that in this reflective practice a transference

of onus occurs from the teacher to student; students are encouraged to regulate their working methods, which requires a degree of resiliency, reflection and responsibility. As evident with this discussion of reflection, the curriculum attempts to address not only content matter, but it also addresses skills that relate to *how* actors within the school setting communicate and receive content in order for learning to occur.

Resilience. In addition to the practice of reflecting, one particular quality that is promoted within the curriculum, and that is perceived to contribute to and benefit the process of learning, is *resilience*. The curriculum states that, “Competence development is influenced not only by the contents on which the pupils work but also, and especially, by how they work and how the interaction between the learner and the environment functions” (Finnish National Board of Education, 2016a, p. 21). The phrase *also, and especially, by how they work* demonstrates the emphasis that the curriculum places upon the *way* that actors within education, both staff and students, work in a learning environment. Additionally, the phrase *how the interactions between the learning and the environment functions* highlights the stress places upon the practices and processes within education as opposed to instructional material. The curriculum discusses students’, “opportunities for learning to anticipate any difficulties that they may encounter in the work and to also face failure and disappointments. The pupils are encouraged to show tenacity in bringing their work to conclusion” (Finnish National Board of Education, 2016a, p. 25). Though not directly identified, resilience is alluded to with the combined mention of *failure and disappointments* and how students *are encouraged to show tenacity*. By noting that instruction allows for *learning to anticipate any difficulties*, the curriculum is disclosing an educational practice; through instruction activities, students are presented with the message that *difficulties* are an expected aspect in their work, and the use of the word *opportunities* also indicates that

these *difficulties* do not possess an especially negative connotation. Instead, *difficulties* are perceived to be a component of learning, and responses to these *difficulties* that the curriculum encourages are students' ability *to anticipate* and *to show tenacity*. At the upper secondary level, this message is conveyed through the mathematics objectives for the advanced syllabus; the first objective notes that the student “gathers positive learning experiences and becomes accustomed to persistent work, and thus learns to trust his or her own mathematical abilities, skills, and thinking” (Finnish National Board of Education, 2016b, p. 140). The word choice *becomes* demonstrates that resilience is an evolving process where students develops and acclimates to the learning practices and working methods of mathematics. The phrase *accustomed to persistent work* demonstrates the resilience that is assumed as *the way* that mathematics is approached and practices; this phrase conveys a perception that resilience is *a habitus* of mathematics that is stressed, and as a habitus, students acquire an automaticity in its implementation when acting in the field of mathematics.

This message of resilience is also conveyed in chapter four of the basic core curriculum, with discussion of *Principles that guide the development of the school culture*. When discussing facets of a learning community, the curriculum states that, “The community encourages each one of its members to try their best, and to also learn from their mistakes. It sets suitable challenges and supports the community members” (Finnish National Board of Education, 2016a, p. 28). In this particular instance, obstacles are referenced with use of both *mistakes* and *challenges*. Not only does the encouragement to *learn from their mistakes* situate actors within a learning community to consider mistakes to be a learning opportunity, but the phrase *set suitable challenges* suggests that instructional practices incorporate learning scenarios that require students to overcome and persist. In this discussion, the use of *try their best* and *suitable*

indicates that students are presented with appropriate and attainable challenges; words such as *encourages* and *supports* signifies a reassuring quality within this process of promoting resiliency. This resiliency transpires within the mathematics curriculum for grades seven to nine; in the text, it directly states that, “The instruction of mathematics guides the pupils towards goal-oriented, precise, focused, and persistent activity” (Finnish National Board of Education, 2016a, p. 402-403). The series of descriptors *goal-oriented, precise, focused, and persistent* emphasizes a demand for resiliency in mathematics practices and processes of mathematics learning. The instructional objectives for grades seven to nine also allude to elements of resiliency. For example, mathematics objectives include intents, “to strengthen the pupil’s motivation, positive self-image, and confidence as a learner of mathematics” and “to take responsibility for learning mathematics” (Finnish National Board of Education, 2016a, p. 403). These statements convey the curriculums to foster students drive and initiative when interacting with mathematics.

Characteristics of the assessments described in the basic core curriculum also exhibit the resiliency that is fostered through educational processes. The text states that, “Experiences of success encourage pupils to learn more but also to understand that failures and incorrect answers are part of the learning process” (Finnish National Board of Education, 2016a, p. 49). This reiterates the perspective that failure is not a detriment in the learning process, but instead, it is a part of the progression in the learning process. This perspective of *failures and incorrect answers* provide an example of an instructional practice that influences the way that students think and act within their educational context. By first citing *experiences of success* and then noting that failures *are part of the learning process*, the text is alluding to success as the culminating point and failures as a step along the way. With this representation of failures, resilience is assumed because it implies that the failure did not prevent eventual success. This notion applies

specifically to mathematics, when the curriculum notes that, “Studying mathematics is a goal-oriented and persistent pursuit where the pupils take responsibility for their learning” (Finnish National Board of Education, 2016a, p. 136, 252, and 402). The curriculum is describing the process of *studying mathematics*, which is referring to an action as opposed to a content area. Noting that this process is a *persistent pursuit* indicates that the acquisition of mathematics is perceived to be one that requires resilience. Additionally, use of the word *pursuit* and well as the descriptor *goal-oriented* suggests that this process of *studying mathematics* is a purposeful endeavor.

Lifelong learning. Throughout the basic core curriculum, the notion of lifelong learning is both implicitly and explicitly referenced. With discussion of *lifelong learning*, two perceptions unravel. First, *lifelong learning* is portrayed as a process that facilitates individuals’ independence in their own learning, and the extension of this independence in learning stretches beyond the academic setting—both in time and place. Second, *lifelong learning* hold a perception that empowers individuals’ adaptability, progression and evolution within their learning practices.

Learning to learn independently. Within the initial chapters of the core curriculum, *lifelong learning* is identified. “Basic education creates preconditions for lifelong learning, which is an elemental part of building a decent life” (Finnish National Board of Education, 2016a, p. 15). The simplicity and directness of this statement demonstrates the perceived significance of *lifelong learning*. Noting that *basic education creates the preconditions* signifies that compensatory education is the entity that enables *lifelong learning*. In this statement, *lifelong learning* is the only objective that the curriculum identifies with regards to basic education, and the subsequent clause that describes *lifelong learning as an elemental part of building a decent*

life indicates the perception that *lifelong learning* has a crucial impact upon individuals' lives in school and beyond. When describing, *the conception of learning*, the curriculum states that, "Learning is an inseparable part of an individual's growth as a human being and the building of a decent life for the community" (Finnish National Board of Education, 2016a, p. 17). This statement provide insight into the underlying beliefs from which this emphasis upon *lifelong learning* occurs. By stating that *learning is an inseparable part* suggests that learning is perceived to be an innate quality and an inevitable quest for *human beings*. Additionally, it conveys a notion that *human beings* are dependent upon learning in *the building of a decent life*. As exemplified above, the phrase *decent life* is a perceived, and intended, outcome of *lifelong learning*. This phrase demonstrates the consideration of students' lives beyond the school context, and it also holds cultural implication. The descriptor *decent* is a somewhat ambiguous and subjective adjective that alludes to the attainment of a particular life status or situation; the inclusion of such a descriptor is indicative of a cultural assumption, and it is representative of a degree of capital that embedded within this message.

The curriculum also notes that, "Developing the learning-to-learn skills lays the foundation for goal-oriented and lifelong learning" (Finnish National Board of Education, 2016a, p. 17). Here, the curriculum is describing students' development of independent learning skills, which are perceived to contribute to the fulfillment of *lifelong learning*. This contingency of *lifelong learning* upon *learning-to-learn skills* is identifying an instructional goal of facilitating students' independence, and it is indicative of a habitus that is embedded within instructional approaches. Following this statement, the curriculum states that, "Pupils are thus guided in becoming aware of their personal ways of learning and using this knowledge to promote their own learning" (Finnish National Board of Education, 2016a, p. 17). This statement reiterates the

promotion of students' *learning-to-learn*; the phrase *guided in becoming aware of their personal ways of learning* shows an intention to facilitate student's cognizance of their own learning, and the phrase *using this knowledge to promote their own learning* encourages students' application of this metacognitive practice in learning processes. Lastly, when discussing alternate activities in education, the curriculum states: "The school and the library work together to guide the pupils towards lifelong learning and active citizenship" (Finnish National Board of Education, 2016a, p. 45). Repeated use of the verb *guide(d)* within the curriculum's discussion of *lifelong learning* signifies a supportive, but also intentional, practice of steering students towards skills that are perceived to foster their learning-to-learn. Additionally, the inclusion the phrase *active citizenship* demonstrates an assumption that this learning will occur in contexts beyond just academic times and academic settings. This message is visible at each of the grade ranges when specifically discussing mathematics curriculum. For grades one to two, grades three to six, and grades seven to nine, the curriculum repeats the same statement; "The instruction guides the pupils to understand the usefulness of mathematics in their own lives and more broadly in the society" (Finnish National Board of Education, 2016a, p. 137, 252, 402). The phrase *to understand the usefulness of mathematics* demonstrates how the curriculum intent of *learning-to-learn* is relayed within discussion of mathematics. Since the functions and applications of mathematics are dependent upon the context in which it is set, the consideration of *the usefulness of mathematics in their own lives and in the society*, may possess cultural connotations; since the instruction *guides the pupils* in this understanding, capital has the potential to manifest if the ways of thinking or acting within *the society* do not align with a particular individual's ways of thinking and acting. In such an instance, the individual could encounter greater difficulties with recognizing mathematics applications or applying mathematics. Repetition of this statement at

each of the grade intervals indicates an emphasis upon continual learning and application of mathematics, and mention of mathematics application *in their own lives* implies an expectation of independence in the utilization of this mathematics. For grades seven to nine, this message is accentuated when it states that, “Pupils are encouraged to discover and utilise mathematics in their own lives” (Finnish National Board of Education, 2016a, p. 402). The phrase *in their own lives* is again used which indicates an individualization and independence associated with this application. Yet, with this commonality, the word choice within this latter statement also establishes some distinctions; in particular, use of the word *discover* conveys an exploratory component to mathematics, and it encourages students to recognize the presence of mathematics and seek out opportunities to apply it; the word *discover* also suggests an ongoing and constant possibility for this mathematics application and learning.

Learning is evolving. Discussions of lifelong learning also contain a second perception of what is meant, and implied, by lifelong learning. Lifelong learning also portrays an evolving and progressive nature to learning and *being*. Texts within the curriculum communicate a perception that learning is not a finite process, and in this process of learning, reflection, adaptability, and progression are necessary components. The curriculum states, “All activities must reinforce educational equity and equality and improve the pupils’ learning-to-learn skills and capabilities for lifelong learning” (Finnish National Board of Education, 2016a, p. 20). By specifying that *all activities* must address *equity, equality, and pupils’ learning-to-learn skills*, the curriculum is identifying emphases within education. Use of the word *improve* in relation to *pupils’ learning-to-learn skills* and *capabilities for lifelong learning* signifies a perspective that *learning-to-learn skills* are not static, but instead, *learning-to-learn skills* both warrant and facilitate review, reflection, and enhancement as part of the learning process. When discussing *thinking and*

learning to learn, the curriculum expresses that, “The learning-to-learn skills are improved as the pupils are guided to set goals, plan their work, assess their progress” (Finnish National Board of Education, 2016a, p. 22). *Improved* is again used in conjunction with *learning-to-learn skills*, and the learning practices that are noted, *to set goals, plan their work*, and *assess their progress*, highlight the perception that learning is a process; additionally, the phrase *assess their progress* demonstrates the reflective and evolving nature in the implementation of this learning process.

Within chapter three’s discussion of the mission of basic education, a subsection is specifically titled, *Promotion of knowledge and ability, equality and lifelong learning*. In this subsection, the curriculum states that, “The goals laid down in the Government Decree point the way to examining education as a whole that imparts general knowledge and abilities needed here and now and lays a foundation for lifelong learning” (Finnish National Board of Education, 2016a, p. 20). First, reference to *the Government Decree* indicates that the text is reflective of not only an educational goal, but also a societal goal. Following this reference to a legislative decree, the curriculum’s mention of bestowing *general knowledge and abilities* indicates the intent to equipped students with the content *and* necessary skills. This mention of *abilities* broadens the capacities for students’ participation in the *here and now*, and by including the phrase *here and now*, the curriculum is alluding to the present. Following this mention of the present, the text extends students’ participation in learning when it adds the phrase *and lays a foundation for lifelong learning*. The phrase *lays a foundation* signifies the base or beginning of a learning process, and the inclusion of this phrase along with *lifelong learning* indicates an expectation that the *knowledge and abilities* that are imparted upon students will extend throughout their lives.

When discussing assessment in chapter six of the core curriculum, feedback is an integral component that contributes to the adaptive and progressive nature of learning; “By giving feedback, the pupils are guided in becoming aware of their progress, structuring the different stages of their learning, and finding different ways of reaching their goals” (Finnish National Board of Education, 2016a, p. 53). By noting *different stages of their learning*, the curriculum is acknowledging that learning is a constant and gradated process. The phrase *structuring the difference stages* demonstrates the perception that learning is an emergent process that is evolving and constructed on the basis of feedback. Preceding this statement, the curriculum mentions students *becoming aware of their progress*, which demonstrates that the progression of learning is malleable. This concept of adaptability in learning is reiterated with mention of students *finding different ways of reaching their goals*, and it is evident within discussion of mathematics assessment and learning processes for grades three to six: “Assessment shall be versatile and feedback instructive and constructive. They shall support the development of the pupils’ mathematical skills and, when necessary, encourage them to try again” (Finnish National Board of Education, 2016a, p. 255). Noting the *instructive and constructive* nature of mathematics assessment indicates that the feedback is incorporated into instructional practices *and* feedback is perceived to contribute to *the development of the pupils’ mathematics skills*. This description, as well as that phrase, *when necessary, encourage them to try again*, reiterate the evolving and progressive characteristics of learning, and specifically mathematics learning.

Education Policy

Finnish Education Related Acts and Decrees

The Basic Education Act alludes to *lifelong learning* when it identifies the legislation’s educational objective “to provide them with knowledge and skills needed in life” (Ministry of

Justice, 1998, p.1). In this description, education is perceived to be that which prepares students to participate in contexts beyond the school setting using *knowledge and skills* obtained from their education. *Lifelong learning* is directly identified in the Finnish National Board of Education Decree (2008) when it states that, “The Ministry of Education and Culture shall promote *lifelong learning*, ensure that high-quality teaching and education are organised effectively” (Ministry of Justice, 2008, p. 1). The inclusion of this statement within the first section of this decree demonstrates the perceived importance of facilitating and enforcing *lifelong learning* in education; cognizance of *lifelong learning* in this document, which is issued directly from the Finnish National Board of Education, provides insight into the inclusion of this characteristic at the instructional level, and it establishes the basis for its fruition within basic and secondary curriculum documents.

Students’ active participation is also a notable component that is evident in this Act. When discussing special supports and individual arrangements, the text notes that, “The plan must be devised, unless there is a manifest excuse not to do so, in collaboration with the pupil, the parent or the carer” (Ministry of Justice, 1998, p. 9). The use of the word *must* as well as the phrase *in collaboration with the pupil* demonstrates the legislative expectation for students to take an active role in their education. This message of participation and collaboration is reiterated when describing pupil welfare processes, and the Act states that services, “shall be provided in collaboration with the pupil and with the parent, carer or some other legal representative of the pupil” (Ministry of Justice, 1998, p. 14). This text demonstrates the cooperation that is embedded within education and welfare processes and it emphasizes the inclusion of students’ in their own learning and support processes. A specific section in the Basic Education Act is dedicated to and titled, *The pupil’s duties*. In this section, two expectations are

identified for students; first, “The pupil shall attend basic education unless he or she has been temporarily exempted for a special reason” and second, “The pupil shall complete his or her assignments diligently and behave correctly” (Ministry of Justice, 1998, p. 16). The inclusion of this section demonstrates the pronounced role that students have within the educational context; additionally, the repeated use of the phrase *thee pupil shall* indicates a declaration of students’ fundamental responsibilities within the field of education. A particular habitus is assumed in the phrases *complete his or her assignments diligently* and *behave correctly*; the reference to each of these descriptions implies an understanding of what attitudes, thoughts, and actions is expected of students who act *diligently* and *correctly*.

Cultural Influences in Education and Mathematics

The Finnish National Agency for Education and the Ministry of Education and Culture’s publication, *Finnish Education in a Nutshell* (2017) reiterates a recurrent theme, and habitus, that was evident in curriculum documents and educational policies. In the brochure’s section, *Equity in Education*, the final subsection is titled, *Life-long learning in focus* (p. 9) and states that, “The Finnish education system has no dead-ends” (Finnish National Agency for Education, 2017, p. 9). The text within this subsection identifies underlying historical influences that contribute to this perception of education and *lifelong learning* when it reveals that the first high school started in 1889 (p. 9). The brochure also affiliates *lifelong learning* with other educational practices and reveals the alignment of cultural and educational objectives when it explains that adult education, “promotes personal growth, health and well-being by offering courses relating to citizenship skills and society” (Finnish National Agency for Education, 2017, p. 10). The inclusion of *citizenship skills* and *society* parallels the curriculum’s consideration of education in relation to both the individual and their contribution to the broader community.

The consideration of *lifelong learning* resurfaces in a later section of *Finnish Education in a Nutshell* with the publication's inclusion of a section titled, *Early Childhood and Basic Education as Part of Life-long Learning* (Finnish National Agency for Education, 2017, p. 14). Here, creativity and play are promoted, and "the principles of a good learning environment, working approaches as well as the concept of learning are also addressed" (Finnish National Agency for Education, 2017, p. 16). Describing *working approaches* and *the concept of learning as principles* demonstrates that these aspects of education are of particular value within the Finnish culture. By directly listing the *learning environment*, *working approaches* and *the concept of learning*, the brochure is also alluding to reflective practices that *are also addressed* in education and promote *lifelong learning*. Students' self-assessment with the intent "to support the growth of self-knowledge and study skills and to help the pupils to learn to be aware of their progress and learning process" (Finnish National Agency for Education, 2017, p. 17) reiterates a cultural, and educational emphasis on self-reflective practices to support *independence in lifelong learning*.

CHAPTER 5: DISCUSSION

Summary and Implications

This study uses critical discourse analysis to delve into Finnish curriculum documents, policy-related texts, legislative acts and decrees, social texts, and PISA data and analyses in order to gain a better understanding of the presence (or absence) of power within educational and mathematics entities in Finland. The subsequent text summarizes the key findings pertaining to the two core inquiries of this study. First, the identified elements pertaining to the nation's high degree of equity are reviewed. Next, this chapter applies Fairclough's (2013) four stages of critical discourse analysis to describe the inequities that are identifiable within the educational and mathematics texts. A summary of core themes related to the educational and mathematics practices and procedures of the Finnish culture are described, and finally, limitations are acknowledged, and areas of future research also follow.

Research Question 1: Equity

In review of the Finnish curriculum documents, equity is at the forefront of the processes and practices that are identified in the text. In this pursuit for equity, the documents highlight the presence of autonomy, flexibility, and versatility, which lend themselves to equitable educational opportunities. The curriculum references autonomy and its role in enabling schools and education providers to exercise localized decision-making. The localization of education allows education providers to individualize school considerations, and with this individualization, both flexibility and versatility are necessary. Autonomy, flexibility and versatility are embedded throughout the texts and assume a role in the acknowledgement of individual students' and families' life

situations, the promotion of instructional differentiation, the allowance for assessment adaptations, and the incorporation of special supports. Other education related texts, such as *Finnish Education in a Nutshell* (Finnish National Agency for Education, 2018) reiterate equitable intents when the publication opens with the following statement—"One of the basic principles of Finnish education is that all people must have access to high-quality education and training" (p. 6). Text from Finnish legislation also promotes education equity and the Basic Education Act (1998) provides insight into a cultural perception that education is instrumental in facilitating equality in society. When listing the *Objectives of education*, the second objective states that, "Education shall promote civilisation and equality in society and pupils' prerequisites for participating in education" (p. 1) and the third objective expresses that, "The aim of education shall be to secure adequate equity in education throughout the country" (p. 1). Data from the OECD also demonstrates that Finland is among one of seven nations where at least four out of five 15-year-old students master the baseline level of proficiency in science, reading and mathematics" (OECD, 2016, p. 4). This performance demonstrates the high performance of Finnish students, and it also indicates that the equitable intents of the nation's educational system align with Finnish students' performance outcomes across the three core content areas. The triangulation of educational curriculum, educational policy, and international assessment outcomes demonstrates a degree of consistency in these texts that highlights the presence of equity in Finland.

In addition to these equitable, instructional characteristics, the curriculum also demonstrates cognizance of gender equality with its emphasis upon the importance of nullifying gender assumptions in instructional practices and educational contexts. While

the majority of the curriculum embodies an equitable perspective, the curriculum also reveals two particular vulnerabilities with regards to educational access and equity.

Within the curriculum documents, doxa are perceptible, and gender is one area where these doxa infiltrate learning and impact access; a second area of vulnerability pertains to the pairing of both language and culture, where access for individuals who do not speak one of the two national languages *and* individuals who belong to an indigenous or minority culture may be jeopardized.

Research Question 1: Inequity and Gender

Stage 1: Focus Upon a Social Wrong (Fairclough, 2013, p. 235)

With application of Fairclough's (2013) four stages to this critical discourse inquiry, *stage one*, which places "focus upon a social wrong, in its semiotic aspect" (p. 235) discloses the presence of distinct and recurring power dynamics; in relation to Finnish educational and mathematics inequities, two particular demographic characteristics expose *social wrongs*. Gender and the pairing of both culture and language were affected by social wrongs. Initially visible within the basic core curriculum and the upper secondary curriculum, the manifestations of these imbalances were also evident in the OECD's analyses of Finland's assessment performance, Finnish policy and legislation, and social texts generated through the Ministry of Foreign Affairs' website, *This is Finland*.

The power dynamics present among genders unfold as an inconsistent paradigm. While the Finnish curriculum documents, government documents, and social initiatives signify a power dynamic that is (or was) perceived to be detrimental to women, the PISA results and analyses present a more complex conclusion. Women's diminished cultural

capital is evident in the curriculum and government documents; social initiatives, such as the Finnish ministries' release of the Government Action Plan for Gender Equality 2016-2019, the nation's unveiling of the International Gender Equality Prize on International Women's Day (*This is Finland*) and various dialogues related to the gender pay gap also reveal the presence of inequities. However, while these gender inequities exemplify negative components of Finnish society, the modes through which the discrepancies are exposed also demonstrate social recognition, acknowledgement, and intents to rectify these imbalances; in contrast, the PISA performance results, warn of a different gender trajectory for Finland. One positive point in the PISA results indicates that Finland has resisted international trends related to gender and academic performance, particularly in mathematics. However, Finland's performance in the 2012 and 2015 PISA do raise concerns that suggest a vulnerability for male students. Not only did girls outperform boys in the three primary domains of the 2015 PISA, reading, mathematics, and science, but score differences among girls and boys were substantial in the areas of reading and science. Additionally, when comparing performances on the 2012 and 2015 assessments score-differences have widened among boys and girls in mathematics, and a 2016 press release from the Ministry of Education and Culture acknowledges the concerning shift when discussing the outcomes of the 2015 PISA; "the scores raise concern for equality in education, especially for the situation with boys" (Ministry of Education and Culture, 2016, para. 6). Obscuring these concerns for boys is a coinciding concern surrounding girls' participation at the university-level in the sciences, which include mathematics (OECD, 2015). These concurrent gender vulnerabilities lead to questions related to stage two of Fairclough's (2013) stages of analysis, *identify obstacles to addressing the social*

wrong (p. 235).

Stage 2: Obstacles to Addressing the Social Wrong (Fairclough, 2013, p. 235)

One particular challenge that presents in the dueling gender inequities is simultaneously, and equally, addressing the social wrongs encumbering each gender without compromising the access or participation of the other. The binary perception of gender creates a delicate dynamic when attempting to generate a purely neutral balance of power; for example, while Finland's gender score difference for the mathematics and collaborative problem-solving performance was among the lowest, this was not the case for reading and science; Finnish girls' performance ranked first and second respectively among participating countries. These rankings are indicative of the access, participation, and successful performance of girls within the Finnish educational system, which is a positive outcome; however, within this same data related to reading and science, the outcomes also reveal the stark contrast in performance among the two genders (OECD, 2017b).

Additionally, in a more in-depth analysis of particular test items from the 2015 PISA, the OECD reviewed responses related to students' expected careers and in doing so identified large discrepancies among Finnish boys' and girls' responses; "In Finland, boys are more than four times more likely than girls to expect a career as an engineer, scientist or architect" (OECD, 2017, p. 5). A publication by *This is Finland* also points out that while Finland performed very high on the 2015 PISA, "40 percent of top performers are not interested in a science-related career" (Korpela, 2009, para. 5). The article goes on to explain that a reason for such a statistic may be a result of Finnish girls' high performance in all content areas, "however, science is not a favourite choice of

women when it comes to higher education” (Korpela, 2009, para. 6). In the information provided both the OECD and *This is Finland*, the sources are indicating low female participation in the sciences, which encompass mathematics. By noting that *boys are more than four times more likely* and by stating that *science is not a favourite choice of women*, the text is identifying the successful participation and high frequency of males, which is a positive, but it is simultaneously revealing a negative component of the makeup of science-related fields, which is the absence of women. These findings present conflicting outcomes where girls demonstrate higher academic achievement but lower continued participation in science-related pursuits, while boys demonstrate lower academic achievement but sustained, and predominant, participation in science-related fields. Finding an ideal balance where male participation does not occur to the detriment of females’ participation and vice versa, where females’ high academic performance does not coincide with waning male academic performance is a challenge.

While the society is demonstrating an awareness and active intents to address girls’ performance and participation, awareness of boy’s vulnerabilities are less evident and initiatives are more passive; in a statement form a press release from the Ministry of Education and Culture, it is noted that, “The only element that raises concern in this assessment is the poor performance of boys” (Ministry of Education and Culture, 2017a, para. 2). This statement exemplifies the passive stance that appears within the social dialogues related to boys’ performance when it notes that boys’ performance is *the only element that raises concern*. At the same time, the presence of current and prior active initiatives to support girls’ participation raises the question of their effectiveness; in one sense, girls have demonstrated consistent and progressing performance on the PISA

administrations in all content-areas, yet, consistent imbalances also remain in female participation in the sciences at the university level and in subsequent, science-related fields. Therefore, with regards to each gender, does the Finnish social order necessitate these social wrongs; can they “be addressed within it, or only by changing it?” (Fairclough, 2013, p. 238).

Stage 3: The Social Order ‘Needs’ for the Wrong (Fairclough, 2013, p. 235)

An examination of the ideals of the Finnish society is necessary in order to determine if there is a *need* for these gender imbalances and an inherent attempt to preserve the current *social order*; “discourse is ideological in so far as it contributes to sustaining particular relations of power and domination” (Fairclough, 2013, p. 239).

Within the curriculum, inherent doxa surrounding gender were identifiable with regards to a recurring and somewhat assumed sequencing of gender pronouns, such as *he and she*; the use of this sequence signifies a particular power relation that is engrained within the social order, and while it permeates both written and spoken text, its use does not suggest intentional domination. While the curriculum acknowledges the presence of “gendered attitudes and practices” (Finnish National Board of Education, 2016a, p. 31), it does so in a context that demonstrates intentions to both rectify their presence and prohibit their continuance. However, in a press release from the Ministry of Social Affairs and Health identifies the pervasiveness of barriers in the social order: “We encounter rigid gender-related conceptions, stereotypes, in all spheres of society, including working life politics and the media” (Ministry of Social Affairs and Health, 2019, para. 6). The curriculum’s inadvertent identification of gender bias, the OECD’s data and analyses, and the Ministry of Social Affairs and Health’s explicit references to

gendered norms signify that while gender equality is an expressed social, educational, and political initiative, the doxa surrounding gender prevail and gender imbalances still persist. Therefore, while initiatives and action plans may facilitate progress and lead to diminished power imbalances, a paradigmatic shift in the Finnish society may be required in order to remedy this social wrong.

Stage 4: Possible Ways Past the Obstacles (Fairclough, 2013, p. 235)

While gendered norms seem to pervade facets of Finnish economic, educational, and social entities, both the basic core curriculum and the upper secondary schools curricula demonstrate frequent understanding and intentions to neutralize gender's role in instructional practices, educational perceptions and students' access and achievement. Extending beyond the educational realm, both political and social structures also demonstrate awareness and active intents to foster gender equity. Political actions, such as the Act on Equality between Men and Women and The Names Act, demonstrate attempts to nullify assumed gender perceptions and practices. Furthermore, over the past twenty years the Finnish political climate had demonstrated shifts the nation's selection of women in prominent political positions such as prime minister, president of the Supreme Court, and Minister of Finance (Ministry of Social Affairs and Health, n.d.). Additionally, results in the most recent parliamentary election in April of 2019 produced outcomes with a record number of women elected. Processes such as these demonstrate the nation's progress towards the actualization of diminished gender-related power imbalances.

Social initiatives, such as the nation's conception of the International Gender Equality Prize, which is presented to an individual or entity that has promoted gender

equality, and Finland's third National Action Plan which "serves to strengthen the meaningful participation of women in conflict prevention and peacebuilding mainstream gender in security sector and improve the protections of women and girls" ("National Action Plan: Finland", n.d., para. 1) signify efforts to boost women's empowerment. According to a speech by Foreign Minister Timo Soini, the Minister notes the importance of women in the Finnish work force and political, and he identifies social infrastructures that support their participation: identifying the social security system, "a free warm school meal" (Soini, 2018, para. 5) and affordable children's day care. This speech reiterates the social and political intents to consciously facilitate women's participation; this mention of a *warm school meal* and *day care* also identifies the traditionally assigned roles that are (or were) assumed to be the primary role of women in Finnish society. However, reference to supports such as school meals and day care, is representative of social initiatives, embedded practices and policy's positive progress towards gender equality. Lastly, the Government Action Plan for Gender Equality 2016-2019, highlights the nation's intents to address the imbalances and support health and social needs of both genders. The Government Action Plan for Gender Equality 2016-2019 (2017) distinguishes itself from other initiatives by approaching gender equality more broadly and acknowledging the need for changes associated with each gender. It notes intents to "promote gender equality by funding projects that motivate girls to take an interest in pursuits related to mathematics and natural sciences and improve boys' reading skills" (p. 14) and also addresses women and men's equal participation in personal and professional realms, such as in politics, the work force, childcare responsibilities, and sports.

Language and culture

Stage 1: Focus Upon a Social Wrong (Fairclough, 2013, p. 235)

Language and culture indicate a second *social wrong* that is identifiable in the curriculum. Unlike gender, an overt and somewhat acknowledged and accepted presence of power is apparent in the curriculum with regard to language and culture. Within the basic core curriculum and the upper secondary curriculum, the two national languages, Finnish and Swedish, are identified and assumed to be the two languages in which full instruction is guaranteed to be provided; this distinction immediately manifests power imbalances with regards to educational access and cultural capital, and results and analyses from the 2015 PISA align with this recognition. In analysis of Finland's mathematics outcomes, the OECD reported that, "The difference in the percentage of low performers in mathematics between students with an immigrant background and those without an immigrant background is one of the highest among PISA-participating countries and economies" (OECD, 2017b) with the country ranking fifth out of sixty-six participating nations. The curriculum implies the presence of doxa, and the PISA results confirm differences in students' educational and mathematics performance.

Stage 2: Obstacles to Addressing the Social Wrong (Fairclough, 2013, p. 235)

While the national languages of Finnish and Swedish are prioritized, a hierarchy is also apparent among secondary languages. Sámi, Roma, and sign language are the three secondary languages that are directly referenced in the curriculum texts and distinctions in the perception of each are made palpable throughout the curriculum. A degree of respect and prioritization is evident when discussing the Sámi language and culture; however, it is still positioned below Finnish and Swedish.

Roma is a language that the curriculum attempts to accommodate, when possible,

but it lacks an automaticity that the Sámi and sign languages possess. Inclusion of the Roma language is evident in the curriculum, and support for both the Roma language and culture are stated. However, the curriculum explicitly acknowledges the Roma's positioning and assignment as a cultural minority and concedes to this rationale for its less extensive inclusion within the educational context. In the *Universal Periodic Review of the United Nations Human Rights Council: Third National Report by Finland (2017)*, the document states that in a 2014 published report that examined the Roma's experience with discrimination in Finland, "68.7%—exceptionally high percentage—of all interviewed respondents reported experiences of discrimination during the past year" (p. 14). On the Ministry of Foreign Affairs' website, *This is Finland*, one editorial conveys a Finnish singer's observations and perspectives related to the injustices faced by the Roma with the following dialogue; "One time a guy came up to me and said, 'You probably think it's racist to dislike the Gypsies.' When I said yes, he let out a burst of disparaging laughter" (Salokoski, 2011, para. 7). This particular discourse provides an instance of racism, and the impact that cultural capital can have upon individuals or a group. The singer goes on to state that, "The tone of the public discussion about immigrants lately has got me worried. I thought racism was a thing of the past" (Salokoski, 2011, para. 9). Commentary such as this, and the recent statistics reported above, suggest that bias against particular cultures have persisted within Finland.

Other languages and cultures are also alluded to throughout the curriculum; appreciation and embracing of other languages is noted throughout the curriculum documents, which indicates the society's acceptance of and encouragement for the inclusion of other languages and cultures. However, with regards to the curriculum's

discussion of the implementation of other languages' in the context of educational instruction, the text discloses that access is more limited. For foreign-language students, the curriculum indicates the potential for the individuals' mother tongue to be implemented, but it does not guarantee it, and at the secondary level, the curriculum also notes that the other language, or the foreign-language student's mother tongue, will supplement the general curriculum—signifying that the *other language* will not be the primary language of instruction. The practices of sustaining the national languages as the primary language of instruction has the potential to provide immigrant students with greater access since learning in the dominant languages may provide more opportunities. However, maintaining a student's instruction in one of the national languages, if not their mother tongue, also has the potential to hinder immigrant students' access since the primary mode of educational communication would be occurring in an unfamiliar language. The United Nation's (UN) 2017 report notes that, "many factors hamper the education and employment of immigrants" (Ministry for Foreign Affairs, 2017, p. 19). The document continues by explaining that systematic inefficiencies lengthen timelines for immigrants' attainment of residency, employment, and education, all which are forms of capital. A statement such as this, which comes two years after a surge in the nation's immigration, demonstrates the persistence of a systematic need. In 2015, "the number of asylum seekers in Finland grew rapidly, to 32, 476 persons. In 2014 the number was 3, 651, which means a nearly ten-fold increase in asylum applications over the previous year" (Ministry for Foreign Affairs, 2017, p. 18). While the number of individuals entering Finland decreased in subsequent years to 5, 651 in 2016 and 5, 046 in 2017 (Statistics Finland, 2018), the population of immigrants in Finland in 2017 was 249, 452

and 257, 572 in 2018 (Statistics Finland, 2018), which indicates that these individuals comprise approximately 4.5% and 4.6% of the nation's population respectively.

Stage 4: Possible Ways Past the Obstacles (Fairclough, 2013, p. 235)

Though secondary to Finnish and Swedish, Sámi is, at times, partnered with the two national languages, and “instruction provided in Finnish, Swedish, Sámi and, if necessary, some other language” (Finnish National Board of Education, 2016a, p. 12) is possible. Sámi is perceived to be one of the accepted languages, and the Sámi culture appears to be a respected and embraced component of the nation. Several structures, both small and large, are in place for the promotion and practice of the Sámi language and culture. For example, the nation's issuance of the Act on the Sámi Parliament (2003) is legislation that grants “linguistic and cultural autonomy in the Sámi homeland as provided in this Act and other legislation” (Ministry of Justice, 2003, para, 1). The creation of this Act, the presence of a Sámi Parliament, the reference to the Sámi homeland, and the autonomy bestowed upon the culture demonstrates a degree of capital that the Sámi possess. Prominent social practices such as, the celebration of National Sámi Day, and more subtle components such as the creation and use of spellchecker in Sámi demonstrates the culture's attention to and embracing of the Sámi language and culture.

With regards to immigration, the UN's (2017) report identifies several aspects of the Government Integration Programme for 2016 to 2019 that promote inclusion, such as “using immigrants' cultural strengths to enhance Finnish innovation capacity” (Ministry of Economic Affairs and Employment of Finland, 2016, p. 27) and “promoting a humane national discussion culture on immigration policy that will not tolerate racism” (Ministry

of Economic Affairs and Employment of Finland, 2016, p.89). These intents signify national efforts to shift the cultural mindset and way of acting. The UN report identifies pupil welfare services and teacher education practices as two of the current educational structures that will benefit immigrants. Additionally, the curriculum's reference to flexible practices, such as individualizes syllabi, flexible instructional and assessment approaches demonstrate intents to meet students' learning and cultural needs. Within the basic core curriculum, the document also includes appendices that specify "The objective, contents, and assessment of the pupil's learning in the instruction" (Finnish National Board of Education, 2016a, p. 480, 491, and 498) of Sámi, Roma, or an individual's mother tongue. While this does establish a detachment of these cultures from the general curriculum, it also exhibits a dedication to acknowledging and attempting to support students' immersion in their language and culture that may extend beyond the field of Finnish education and culture.

A publication from the Ministry of Education and Culture, *Multilingualism as a Strength*, addresses the importance of language acquisition, the current state of multilingualism in Finland, and ways to encourage multilingualism within the Finnish culture. The document embraces the presence of various languages and recognizes the contributions made by the presence of multilingualism within a culture. While noting the predominance of Finnish, Swedish, and the frequent selection of English as students' tertiary language, the document includes plans to prevent the further decline of multilingualism and the inclusion of languages that extend beyond these three predominant dialects; instructional initiatives such as teacher trainings in "language sensitivity, multiculturalism, bilingual pedagogy and functioning in a multicultural

community” (Ministry of Education and Culture, 2017, p. 21) demonstrate the evolution of multilingualism and multicultural practices in Finland. However, with these positive components, the document acknowledges several obstacles that have the potential to hinder multilingualism. The text candidly identifies current barriers within the current systems: “Major differences in language offerings between schools threaten to create regional and social inequalities” (Ministry of Education and Culture, 2017, p. 8), “There is a small number of teachers with immigrant backgrounds in schools” (Ministry of Education and Culture, 2017, p. 20), and “in reality, municipalities make widely varying decisions because they can hire unqualified teachers for a year at a time” (Ministry of Education and Culture, 2017, p. 20). These three aspects identify systematic issues that pose barriers to the promotion of multilingualism and equity in students’ education.

Stage 3: The Social Order ‘Needs’ for the Wrong (Fairclough, 2013, p. 235)

While the dominance of the two *national* languages suggests a sense of nationalism and need to preserve its traditional culture, explicit intentions and active initiatives related to equity and access are consistently visible in political, social, and educational realms of Finnish culture. However, in the UN’s 2017 report, the document points out that, “Learning a national language, respect for the Finnish culture and customs, and access to work as fast as possible are in a key role” (Ministry for Foreign Affairs, 2017, p. 19). A statement such as this highlights the tremendous value placed upon assimilation of *the other* to the Finnish way, and it alludes to the Finnish language, culture, and way of being as the means to attaining capital and participating in the Finnish *field*. While there is an openness to multiple perspectives, languages, cultures and ways of being, there is also a resolve to accommodate in order to acclimate *the other* to the

Finnish way.

With regards to the Sámi language and culture, it appears as though Finland's social order is making progress with its inclusion of the language and culture in its current state. The *social wrong* that exists with the nation's inclusion of the Roma culture is one that persists. Establishment of the National Policy on Roma and the government's interaction with and involvement of the Advisory Boards on Romani Affairs (Ministry for Foreign Affairs, 2017, p. 14) signify political efforts for Roma inclusion. However, social and educational imbalances remain within the current social order that suggest the need for further change. Lastly, in a compilation by various Finnish ministries the *International Migration 2017-2018 -- Report for Finland* (2018), examines Finland's most recent immigration and integration policies and amendments. The development of this report and the creation and revision of various legislation, such as the Nationality Act, implies that significant social and political changes are occurring; however, due to their recent establishment and implementation, it is difficult to determine their effectiveness and the extent to which these changes have disrupted the prior social order. The report also identifies the three most popular topics (domestically) in the media; these include "asylum seekers' rights", "the security threat associated with migration", and "racism against migrants" (Ministry of the Interior, 2018, p. 11). The document identifies immigrants' ability to gain employment, education and training as an area that it is working to improve, and the report cites multiple instances of hate speech as well as initiatives to prevent and eliminate racism and intolerances. It describes a recent controversy from 2017 surrounding the rejection and return of asylum seekers, demonstrations against such practices, and violations of the human rights of asylum

seekers' (Ministry of the Interior, 2018, p. 48). While many of the instances noted in this report are paired with efforts to rectify inequities and injustices surrounding the nation's admission, acceptance, and access of immigrants in Finland, social and political uncertainties surrounding immigration and integration remain. It is unclear if these recent instances of social unrest, political reforms, and evolving initiatives are a sign of the advent of systematic shifts within Finland or if they are simply products of recognized inequities.

Research Question 2: Habitus

Throughout both the basic core curriculum and the upper secondary schools curriculum, particular themes emerged. Social consciousness and cognizance of one's positioning within a larger community were messages interwoven throughout curriculum documents and embedded within subsequent principles. Appreciation for and awareness of sustaining both the physical environment and the school culture were also paramount. These themes stemmed from and led to cooperative, collective, and collaborative practices and processes in learning. A recurring practice within educational and instructional processes was also the pairing of both the individual and the community. With this sense of community, an ultimate objective of establishing and maintaining a peaceful and supportive learning environment arose, and this notion was identifiable through the habitus that was embedded within the educational and mathematics habitus.

With regard to the educational and mathematics curriculum and habitus of Finland, two broad characteristics were apparent. First, the curriculum encouraged actors' expression and reception of multiple perspectives in their ways of thinking, learning, and acting. With this openness to multiple viewpoints, the curriculum revealed students'

comprehensive and active participation in education, which was enabled by the practices and processes in place. Additionally, an open and creative approach to learning was embraced, and this approach that was perceived to facilitate the inclusion of multiple perspectives. Second, reflection, resilience and lifelong learning were three core features that were recurrent throughout the curriculum's discussion of educational practices and processes. Reflection was a fundamental component of students' self-evaluation, independence, progression, and their interactions with teachers. Resiliency was partnered with reflection, and it was identifiable through the cultural perception that learning is a process, mistakes are an assumed component of the process, and difficulties are inevitable in the acquisition of knowledge and skills. Lastly, lifelong learning was an ultimate intent of education; learning was perceived as an ever-present process that is existent throughout one's life and education fosters and facilitates one's independence in this process. Lifelong learning also aligns with an apparent cultural perception of the constant fluidity and evolution of individuals, communities, and systems. A perspective such as this supports the culture's practices and processes that produce the high level of equity within the Finnish educational system, and it is a perspective such as this that yields constant strides towards enabling and improving equity.

CHAPTER 6: IMPLICATIONS FOR MATHEMATICS EDUCATION

Curriculum texts shape and are shaped by the practices and procedures that embody the habitus of educational and mathematics fields— “The texts are based on parliamentary decision-making processes, including political struggles, and providers of education are obligated to follow them” (Lappalainen & Lahelma, 2016, p. 653-654). Therefore, curriculum texts manifest as the intermediary between Finland’s broader political and social institutions and the culture’s more narrowed educational and localized habitus. These texts echo the nation’s ideal intents and ultimately project the nuanced equities and inequities that exist within the undertones of cultural practices and procedures. Recognition of the textual subtleties that form and are formed by existent equity and inequity within the Finnish culture contribute to an understanding of the mechanisms that facilitate or hinder equitable educational and mathematics access.

This inquiry identified nuanced components of the text that project political and social approaches through the visible habitus. For example, cooperation and collaboration are recurring characteristics for the *way* (habitus) in which cultural practices and procedures are enacted. However, this notion of cooperation and collaboration are also evident intents of curricular text pertaining to school culture and more specifically mathematics practices. As evidenced through the curricular text analysis, the transference of broader cultural notions to content-specific realms, such as mathematics, highlights the significance of identifying and understanding the interplay that exists between policy, curriculum, and practice. The nuanced components of the curriculum are one facet of the educational structuring that have the potential to affect students’ equitable or inequitable participation and influence their academic careers, their mathematics careers and their

participation in society.

Equity is understood as an open and contested concept, taking its meaning from the discursive and institutional context in which it appears (Ferree, 2009, p. 88, 2011, p. 56). The educational system can be seen as one of the contexts in which multi-dimensional forms of inequality are experienced, contested and reproduced in historically changing forms (Lappalainen & Lahelma, 2016, p. 653).

The present inquiry demonstrated the delicate balance that exists among systematic characteristics of Finnish education. For example, while the system's autonomy and flexibility foster equity through individualization, these same features simultaneously create potential vulnerabilities for the infiltration of power imbalances through social and cultural capital. The curriculum communicates the political and social intents of a culture and its message subsequently impacts *what* and *how* practices are enacted within educational and mathematics fields. This inquiry demonstrates the significance and bidirectional nature of curriculum's positioning as it is both influenced by the political and social systems and also influences political, social, and educational realms. Broadening this inquiry to other nations with larger and more heterogenous populations, such as the United States, has the potential to provide novel insights, not only with regards to the equities and inequities of each unique nation, but also into the varied and distinct nature of curriculum within different contexts.

Future Directions

An extension of the timeline and more in-depth analysis of both gender and immigration related inequities are necessary. With regard to gender, two particular areas necessitate further review. First, the shift in gender performance on the mathematics

portion of the PISA occurred between the 2009 and 2012 administrations, with boys performing slightly higher than girls in 2009 and girls performing slightly higher than boys in 2012. While the mathematics score differences among the two genders have remained relatively small, identification and further understanding of the mechanism(s) that enabled and sustained this shift should be explored. Exploration would allow for potential understanding of the processes that can have had an effective, and positive, impact upon Finland's gender equity in mathematics performance; understanding of that which has had a positive effect could benefit other educational entities, and it could also provide insight into the nuances that contribute to girls' persisting underrepresentation in the sciences at the university level. Second, not only has this trend of girls outperforming boys in mathematics continued with the 2015 PISA administration, but this pattern is identifiable in all three core domains of the PISA, and in some domains, this score difference is substantial. An extension of this inquiry could heighten awareness of the substantiating imbalances impacting boys' educational performance, and a more in-depth review of policy documents and their evolution could provide insight into social shifts. For example, a comparison of the Government Action Plan for Gender Equality 2008-2011 with the Government Action Plan for Gender Equality 2016-2019 could provide insight into prior perceptions, Finland's progression towards equity, and areas in which the nation has faltered. The incorporation of the most recently administered 2018 PISA would provide additional data related to each gender's performance, and it would clarify whether these patterns remain constant, have amplified, or have reverted back in favor of boys. Additionally, extending the exploration of gender-related data beyond students' and beyond their performance and achievement could provide further insight into components

that contribute to educational and mathematics outcomes. Specifically, incorporating data pertaining to educational actors, such as teachers and administrators, and the prior and current composition of individuals by gender may reveal additional influences that contribute to gender-related divergences in performance and participation.

Inclusion of the 2018 PISA will also provide additional data related to the presence of any ongoing or emerging performance differences among immigrant and nonimmigrant students. The incorporation of the data will provide initial insights into the effectiveness of recent legislation and reforms surrounding immigration and integration. A more in-depth review of social occurrences related to immigrant inequities is needed to fully understand the presence of power dynamics and the role of capital in social, political, and educational fields. Further analysis of social and political innovations and responses to these inequities is also warranted, not only to discern the necessary changes but also to gauge the society's perception and tolerance for the identified inequities. As described in Sinkkonen, & Kyttälä's (2014) study, "growing immigration is a more recent phenomenon (EUMC 2004). However, during the last 20 years, Finland has become a more multicultural society" (p. 167). While immigration is not a novelty to Finland, the nation is in the midst of establishing and restructuring immigration policy and social programs. Therefore, more time may be needed in order to fully understand the influences and effectiveness of these more recent social and political reforms. In particular, examining the presence of and effectiveness of training programs that facilitate the cultural competencies of actors within educational fields would contribute to a greater understanding of the attributes and deficiencies of the educational infrastructure that emanate equitable participation. Finally, understanding the nuances of immigrants'

nationalities and the ways and degree to which individuals of various nationalities experience inequities in Finland could contribute to the development of more effective and more immediate, positive change.

REFERENCES

- Aho, E., Pitkanen, K., & Sahlberg, P. (2006). *Policy development and reform principles of basic and secondary education in Finland since 1968*. Washington, DC: World Bank.
- Andere, E.M. (2014). *Teachers' perspectives on Finnish school education: Creating learning environments*. New York, NY: Springer. DOI 10.1007/978-3-319-02824-8.
- Andrews, P., Ryve, A., Hemmi, K., & Sayers, J (2014). PISA, TIMSS and Finnish mathematics teaching: an enigma in search of an explanation. *Educational Studies in Mathematics*, 87, 7-26. DOI 10.1007/s10649-014-9545-3
- Andrews, P. (2016). Understanding the cultural construction of school mathematics. In B. Larvor (Ed.), *Mathematical cultures: The London meetings 2012-2014* (pp. 9-23). Switzerland: Springer International Publishing.
- Apple, M.W. (1992). Do the standards go far enough? Power, policy, and practice in mathematics education. *Journal for Research in Mathematics Education*, 23. 412-431.
- Baker, T. & Clark, J. (2011). Educational equity in ethnically diverse group work. *Intercultural Education*, 22(5). pp. 411-422.
- Bartolini Bussi, M.G. & Martignone, F. (2013). Cultural issues in the communication of research on mathematics education. *For the Learning of Mathematics*, 33(1). 2-8.
- Basic Education. (n.d.). Retrieved from https://www.oph.fi/english/curricula_and_qualifications/basic_education.
- Boaler, J., & Greeno, J. (2000). Identity, agency, and knowing in mathematical worlds. In

- J. Boaler (Ed.), *Multiple perspectives on mathematics teaching and learning* (pp. 45-82). Stamford, CT: Ablex.
- Boaler, J. (2002). Paying the price for 'Sugar and Spice': Shifting the analytical lens in equity research. *Mathematical Thinking and Learning*, 4(2-3), 127-144.
- Boaler, J., Altendorff, L., & Kent, G. (2011). Mathematics and science inequalities in the United Kingdom: when elitism, sexism, and culture collide. *Oxford Review of Education*, 37(4), 457-484.
- Bourdieu, P. (1977). *Outline of theory of practice*. New York: Cambridge University Press.
- Bourdieu, P. (1989). Social space and symbolic power. *Sociological Theory*, 7(1), 14-25.
- Bourdieu, P. (1991). *Language and symbolic power*. (G. Raymond & M. Adamson, Trans.). Cambridge: Polity Press.
- Bronfenbrenner, U. (1976). The experimental ecology of education. *American Education Research Association*, 5(9), 5-15.
- Bulle, N. (2011). Comparing OECD educational models through the prism of PISA. *Comparative Education*, 47(4), 503-521.
- Capone, A. & Mey, J.L. (Eds.) (2016). *Interdisciplinary Studies in Pragmatics, Culture and Society*, Switzerland: Springer International Publishing.
- Central Intelligence Agency. (n.d.). The World Factbook. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/fi.html>.
- Cobb, P., Yackel, E., & Wood, T. (1992), A constructivist alternative to the representational view of the mind in mathematics education. *Journal for Research in Mathematics Education*, 23(1), 2-33.

- Cobb, P. (1994). Where is the mind? Constructivist and sociocultural perspectives on mathematical development. *Educational Researcher*, 23(7). 13-20.
- Cobb, P. & Hodge, L.L. (2002). A relational perspective on issues of cultural diversity and equity as they play out in the mathematics classroom. *Mathematical Thinking and Learning*, 4(2-3). 249-284. https://doi.org/10.1207/S15327833MTL04023_7
- Cobb, P. & Hodge, L.L. (2009). An interpretive scheme for analyzing the identities that students develop in mathematics classrooms. *Journal for Research in Mathematics*, 40(1). 1-36.
- Coburn, C.E. (2005). The Role of nonsystem actors in the relationship between policy and practice.: The case of reading instruction in California. *Educational Evaluation and Policy Analysis*, 27(1), 23-52.
- Compare Your Country. (n.d.). Compare Your Country – PISA 2015. Retrieved from <http://www.compareyourcountry.org/pisa/country/FIN?lg=en>.
- Craig, C.J. (2017). International teacher attrition: multiperspective views. *Teachers and Teaching: Theory and Practice*, 23(8). 859-862.
<https://doi.org/10.1080/13540602.2017.1360860>
- Ekstam, U. Linnanmäki, K. & Aunio, P. (2015). Educational support for low performing students in mathematics in the three tier support model in Finnish lower secondary schools. *European Journal of Special Needs Education*, 30(1). 75-92.
<https://doi.org/10.1080/08856257.2014.964578>
- Ernest, Paul. (2002). Empowerment in mathematics education. *Philosophy of Mathematics Education Journal*, 15.
- Esmonde, I. (2009). Ideas and identities: Supporting equity in cooperative mathematics

learning. *Review of Educational Research*, 79(2). 1008-1043. DOI:
10.3102/0034654309332562

Fairclough, Norman. (1989). *Language and Power*, London. Longman.

Fairclough, N. (2001). *Language and Power*. Harlow, England: Longman.

Fairclough, N. (2013). *Critical discourse analysis: The critical study of language*.
London: Routledge.

Finnish National Agency for Education. (2017). *Finnish education in a Nutshell*.

Retrieved from https://www.oph.fi/english/education_system.

Finnish National Board of Education. (2016a). *National Core Curriculum for Basic Education 2014*. Helsinki: Finnish National Agency for Education Publications.

Finnish National Board of Education. (2016b). *National Core Curriculum for General Upper Secondary Schools 2015*. Helsinki: Finnish National Board of Education Publications.

Furuto, L. I. (2014). Pacific Ethnomathematics: Pedagogy and practices in mathematics education. *Teaching Mathematics and its Applications*, 1-12.

Garcia Ruiz, M.J. & Ciorida, J.V. (2015). The success of educational tradition in postmodern times: The case of Finland. *International Journal of Educational Reform*, 24(1), 20-36.

Gee, J. P. (1990). *Social linguistics and literacies: Ideology in discourses*. (Third Edition, 2008). New York: Routledge.

Gee, J. P. (1999). *An introduction to discourse analysis: Theory and method*. (Fourth Edition, 2014). London: Routledge.

Gee, J. P. (2008). *Social linguistics and literacies: Ideology in Discourses* (3rd ed). New

York: Routledge.

General upper secondary education. (n.d.). Retrieved from

https://www.oph.fi/english/curricula_and_qualifications/basic_education.

Government Publications. (2015). *Finland, a land of solutions: Strategic Programme of Prime Minister Juha Sipilä's Government*. Retrieved from

<https://valtioneuvosto.fi/en/sipila/government-programme>.

Gravemeijer, K., Stephan, M., Julie, C., Lin, F. & Ohtani, M. (2017). What mathematics education may prepare students for the society of the future? *International*

Journal of Science and Mathematics Education, 15(1). 105-123. DOI

10.1007/s10763-017-9814-6

Guitierrez, R. (2013). The sociopolitical turn in mathematics education. *Journal for*

Research in Mathematics Education, 44(1). 37-68.

Hancock, L. (2011, September). Why are Finland's schools successful? The country's

achievements in education have other nations doing their homework. *Smithsonian magazine*.

Hanushek, E.A., Peterson, P.E., & Woessmann, L. (2012). Achievement growth:

International and U.S. state trends in student performance. *Harvard's Program on Educational Policy and Governance*, 12(3).

Heikkinen, H., Jokinen, H., & Tynjälä, P. (2012). Teacher education and development as

lifelong and lifewide learning. In H. Heikkinen, H. Jokinen, & P. Tynjälä (Eds.),

Peer-group mentoring for teacher development (pp. 3–30). London: Routledge.

Hofstede, G. (1986). Cultural differences in teaching and learning. *International*

Journal of Intercultural Relations, 10. pp. 301-320.

- Holmes, K. Gore, J., Smith, M., & Lloyd, A. (2018). An integrated analysis of school students' aspirations for STEM careers: Which student and school factors are most predictive? DOI 10.1007/s10763-016-9793-z
- Inghilleri, M. (2005). The sociology of Bourdieu and the construction of the 'object' in translating and interpreting studies. *The Translator*, 11(2). 125-145.
- Ikävalko, E., & Kantola, J. (2017). Feminist resistance and resistance to feminism in gender equality planning in Finland. *European journal of women's studies*, 24(3), 233-248.
- Jorgensen, R., Gates, P. & Roper, V. (2013). Structural exclusion through school mathematics: using Bourdieu to understand mathematics as a social practice. *Educational Studies in Mathematics*, 87. 221-239. DOI 10.1007/s10649-013-9468-4
- Kinard, J.T. & Kozulin, A. (2008). *Rigorous Mathematical Thinking: Conceptual Formation in the Mathematics Classroom*, New York: Cambridge University Press.
- Korpela, S. (2009, June). Young Finns Know Their Science. *This is Finland*. Retrieved from <https://finland.fi>.
- Lappalainen, S., & Lahelma, E. (2016). Subtle discourses on equality in the Finnish curricula of upper secondary education: reflections of the imagined society. *Journal of Curriculum Studies*, 48(5), 650-670.
<https://doi.org/10.1080/00220272.2015.1069399>
- Lempinen, S. & Niemi, A.M. (2018). Special support and neighborhood school allocation

- in Finland: a study on parental school choice. *European Journal of Special Needs Education*, 33(1). 102-117.
- Le Roux, K & Adler, J. (2016). A critical discourse analysis of practical problems in a foundation mathematics course in a South African University. *Educational Studies in Mathematics*, 91. 227-246. DOI 10.1007/s10649-015-9656-5
- Lui, K. & Guo, F. (2016). A review on critical discourse analysis. *Theory and Practice in Language Studies*, 6(5), p. 1076-1084.
- Lundkvist, M., Nyby, J., Autto, J. & Nygard, M. (2017). From universality to selectivity? The background, discourse and ideas of recent early childhood education and care reforms in Finland. *Early Childhood Development and Care*, 187 (10), 1543-1556.
- Malaty, George. (1998). Eastern and Western mathematics education: unity, diversity, and problems. *International Journal of Mathematical Education in Science and Technology*, 29(3), 421-436.
- Martins, L. & Veiga, P. (2010). Do inequalities in parents' education play an important role in PISA students' mathematics achievement test score disparities? *Economics of Educational Review*, 29. 1016-1033.
- Ministry of Economic Affairs and Employment of Finland. (2016). *Government Integration Programme for 2016-2019 and Government Resolution on a Government Integration Programme*. Helsinki: Publications of the Ministry of Economic Affairs and Employment.
- Ministry of Education and Culture. (2016). *PISA 2015: Finnish youth still at the top despite the drop*. Retrieved from <https://minedu.fi/en/press-releases-and-news>.

- Ministry of Education and Culture. (2017). *Multilingualism as a strength: Procedural recommendations for developing Finland's national language reserve*. Retrieved from <https://minedu.fi/en/multilingualism>.
- Ministry of Education and Culture. (2017a). *PISA 2015: Finnish youth among the best in collaborative problem solving*. Retrieved from <https://minedu.fi/en/press-releases-and-news>.
- Ministry for Foreign Affairs of Finland. (2017). *Universal Periodic Review of the United Nations Human Rights Council: Third National Report by Finland*. Retrieved from <https://um.fi/the-un-s-periodic-review-of-human-rights-in-finland-in-2017>.
- Ministry of Foreign Affairs of Finland. (n.d.). *Migration and refugee crisis in Europe*. Retrieved from <https://um.fi/migration-and-refugee-crisis-in-europe>.
- Ministry of the Interior. (2018). *International Migration 2017-2018 – Report for Finland*. Helsinki: Ministry of the Interior Publications.
- Ministry of Justice. (1991). Finnish National Board of Education Act. Retrieved from <https://www.finlex.fi/en/laki/kaannokset/1991/en19910182.pdf>.
- Ministry of Justice. (1998). Basic Education Act. Retrieved from <https://www.finlex.fi/en/laki/kaannokset/1998/en19980628.pdf>.
- Ministry of Justice. (2003). Act on the Sámi Parliament. Retrieved from <https://www.finlex.fi/en/laki/kaannokset/1995/en19950974.pdf>.
- Ministry of Justice. (2008). Finnish National Board of Education Decree. Retrieved from <https://www.finlex.fi/fi/laki/kaannokset/2008/en20080805.pdf>.
- Ministry of Social Affairs and Health. (2017). *Government Action Plan for Gender*

Equality 2016-2019. Helsinki: Publications of the Ministry of Social Affairs and Health.

Ministry of Social Affairs and Health. (2019). *Gender stereotypes and sexism represent a serious obstacle to the achievement of equality*. Retrieved from <https://valtioneuvosto.fi/en/web/stm/frontpage>.

Ministry of Social Affairs and Health. (n.d). *Finland is a gender equality pioneer*. Retrieved from <https://valtioneuvosto.fi/en/web/stm/frontpage>.

National Action Plan: Finland. (n.d). Retrieved from <https://www.peacewomen.org/nap-finland>.

Niemi, H. & Jakku-Sihvonen, R. (2011) Teacher education in Finland. In M. V. Zuljan & J. Vogrinc, (Eds.). *European Dimensions of Teacher Education-Similarities and Differences* (33-51). Ljubljana: European Union.

Nolan, K. (2012). Dispositions in the field: viewing mathematics through the lens of Bourdieu's social field theory. *Educational Studies in Mathematics*, 80 (1/2). 201-215.

O'Connor, M.C. (1998). Language socialization in the mathematics classroom: Discourse practices and mathematical thinking. In M. Lambert & M.L. Blunk (Eds.), *Talking Mathematics in school: Studies of teaching and learning*. New York, NY: Cambridge University Press, p. 17-55.

OECD (2010), *PISA 2009 Results: What Students Know and Can Do – Student Performance in Reading, Mathematics and Science (Volume I)*
<http://dx.doi.org/10.1787/9789264091450-en>.

OECD. (2012a). *Equity and Quality in Education: Supporting Disadvantaged Students*

and schools, OECD Publishing. <http://dx.doi.org/10.1787/9789264130852-en>.

OECD (2014), *PISA 2012 Results: What Students Know and Can Do – Student Performance in Mathematics, Reading and Science (Volume I, Revised edition, February 2014)*, PISA, OECD Publishing.

<http://dx.doi.org/10.1787/9789264201118-en>.

OECD (2014a), *PISA 2012 Results in Focus: What 15-Year-Olds Know and What They Can Do with What They Know*, PISA, OECD Publishing.

OECD. (2015), *The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence*, PISA, OECD Publishing. <http://dx.doi.org/10.1787/9789264229945-en>.

OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/9789264266490-en>.

OECD (2016a). *PISA 2015 Results in Focus*, OECD Publishing, Paris. 1-16.

OECD (2016b), "Overview: Policies and practices for successful schools", in *PISA 2015 Results (Volume II): Policies and practices for successful schools*, OECD Publishing, Paris. <http://dx.doi.org.libproxy.temple.edu/10.1787/9789264267510-5-en>

OECD (2016c), "School governance, assessment and accountability", in *PISA 2015 Results (Volume II): Policies and practices for successful schools*, OECD Publishing, Paris. <http://dx.doi.org.libproxy.temple.edu/10.1787/9789264267510-8-en>

OECD. (2017), "What kind of careers in science do 15-year-old boys and girls expect for themselves?", *PISA in Focus*, No. 69, OECD Publishing, Paris, <https://doi.org/10.1787/76e7442c-en>.

- OECD (2017a), "What is PISA?", in *PISA 2015 Results (Volume V): Collaborative Problem Solving*, OECD Publishing, Paris.
- OECD (2017b). Country profile: Finland in *Education GPS: The World of Education at Your Fingertips*. OECD Publishing, Paris, 1-11.
- OECD (2017), *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematic, Financial Literacy and Collaborative Problem Solving*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/9789264281820-en>.
- OECD. (2018). *Is the last mile the longest? Economic gains from gender equality in Nordic countries*. Retrieved from <http://www.oecd.org/publications/is-the-last-mile-the-longest-economic-gains-from-gender-equality-in-nordic-countries-9789264300040-en.htm>.
- OECD.(n.d.). *PISA 2015 key findings for Finland*. Retrieved from <http://www.oecd.org/pisa/pisa-2015-finland.htm>.
- Pais, Alexandre. (2013). Ethnomathematics and the limits of culture. *For the Learning of Mathematics*, 33(3), 2-6.
- Pais, A. (2015). Symbolising the real of mathematics education. *Educational Studies in Mathematics*, 89, 375-391. DOI 10.1007/s10649-015-9602-6
- Pehkonen, E. (1997). Learning results from the viewpoint of equity: Boys, girls, and mathematics. *Teacher Mathematics and Its Application*, 16 (2), 58-63.
- Permuth, S. & Dalzell, N. (2013). Driven by history: Mathematics education reform. *International Journal of Educational Reform*, 22(3), 235-251.
- Purdue Writing Lab. (n.d). *General Format*. Retrieved from

https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html.

- Pyhalto, K., Pietarinen, J., & Salmela-Aro, K. (2011). Teacher-working-environment fit as a framework for burnout experienced by Finnish teachers. *Teaching and Teacher Education, 27*, 1101-1110.
- Pyhalto, K., Soini, T., & Pietarinen, J. (2011). A systematic perspective on school reform: Principals' and chief education officers perspectives on school development. *Journal of Educational Administration, 49*(1). 46-61.
- Risku, M., Kanervio, P., & Pulkkinen, S. (2014). School boards in Finland. In L. Moos & J.M. Paulsen (Eds) *School Boards in the Governance Process* (pp. 31-48). Switzerland: Springer International Publishing.
- Rosvall, P. Å., Hjelmér, C., & Lappalainen, S. (2017). Staying in the comfort zones—Low expectations in vocational education and training mathematics teaching in Sweden and Finland. *European Educational Research Journal, 16*(4), 425-439.
s://doi.org/10.1080/02680930601158919
- Ryve, A. Hemmir, K., & Borjesson, M. (2013). Discourses about school-based mathematics teacher education in Finland and Sweden. *Scandinavian Journal of Educational Research, 57*(2). 132-147.
- Sahlberg, P. (2007). Education policies for raising student learning: the Finnish approach. *Journal of Education Policy, 22*(2). 147-171.
<https://doi.org/10.1080/02680930601158919>
- Sahlberg, Pasi. (2011). Paradoxes of educational improvement: The Finnish experience. *Scottish Educational Review, 43*(1), 3-23.

- Sahlberg, Pasi. (2012). *Finnish Lessons 2.0: What can the world learn from educational change in Finland? (Series on school reform)*. Teachers College Press: New York.
- Salmela-Aro, K., Kiuri, N., Pietikainen, M., & Jokela, J. (2008). Does school matter? The role of school context in adolescents' school-related burnout. *European Psychologist, 13*(1). 12-23.
- Salokoski, E. (2011, April). Leaving our comfort zone. *This is Finland*. Retrieved from <https://finland.fi>.
- Saloviita, T. & Schaffus, T. (2016). Teacher attitudes towards inclusive education in Finland and Brandenburg Germany and the issue of extra work. *European Journal of Special Needs Education, 31*(4). 458-471.
<https://doi.org/10.1080/08856257.2016.1194569>
- Samuelsson, K. & Lindblad, S. (2015). School management, cultures of teaching and student outcomes: Comparing the cases of Finland and Sweden. *Teaching and Teacher Education, 49*, 168-177.
- Saxe, G. (1988). Candy selling and math learning. *Educational Researcher, 17*(6). 13-21.
- Seaburg, R.L. (2015). Mathematics Lessons from Finland and Sweden. *National Council of Teachers of Mathematics, 108*(8). 593-598.
- Simola, H. (2005). The Finnish miracle of PISA: Historical and sociological remarks on teaching and teacher education. *Comparative Education, 41*(4). Pp. 455-470.
- Sinkkonen, H.M. & Kyttälä, M. (2014). Experiences of Finnish teachers working with

- immigrant students. *European Journal of Special Needs Education*, 29(2). 167-183.
- Soini, Timo. (2018, November 21). Speech by Foreign Minister Timo Soini on Women, security and democratization. Retrieved from <https://um.fi/speeches>.
- Stacey, K. & Turner, R. (Eds.). (2015). *Assessing mathematical literacy: The PISA experience*. New York: Springer.
- Statistics Finland. (2018). *Foreigners in Finland*. Retrieved from https://www.stat.fi/tup/suoluk/suoluk_vaesto_en.html.
- Smolentseva, Anna. (2016). Universal higher education and positional advantage: Soviet legacies and neoliberal transformations in Russia. *Higher Education*, 73(2), 209-226. DOI 10.1007/s10734-016-0009-9
- Stigler, J. W. & Hiebert, J. (1999). *The Teaching Gap*. New York: Free Press.
- Taylor, S. (2004). Researching educational policy and change in 'new times': using critical discourse analysis. *Journal of Educational Policy*, 19(4). 433-451.
- This is Finland. (n.d.). Retrieved from <https://finland.fi>.
- Thomson, P. (2005). Bringing Bourdieu to policy sociology: codification, misrecognition and exchange value in the UK context. *Journal of Education Policy*. 20(6). 741-758.
- Tirri, K. (2014). The last 40 years in Finnish teacher education. *Journal of Education for Teaching*. 40(5). 600-609.
- Touhilampi, L. (2016). Contextualizing mathematics related affect: Significance of

students' individual and social level affect in Finland and Chile. *Journal of Research in Mathematics Education*, 5(1). 7-27.

<http://dx.doi.org/10.4471/redimat.2016.1823>

van Leeuwen, T. (2005). Three models of interdisciplinarity. In R. Wodak & P. Chilton (Eds.), *A new agent in (critical) discourse analysis* (p. 12). Amsterdam: John Benjamin Publishing Company.

Virtanen, T.E., Kiuru, N., Lerkkanen, M.K., Poikkeus, A.M. & Kuorelahti, M. (2016). Assessment of student engagement among high school students and associations with self-esteem, burnout, and academic achievement. *Journal for Educational Research Online*, 8(2). 136-157.

Vygotsky, L. (1979). Instrumental method in psychology. In J. Wertsch (Ed.), *The concept of activity in Soviet psychology*, Armonk, NY: Sharpe.

Waugh, L.R., Catalano, T., Masaeed, K.A., Do, T.H., & Renigar, P. G. (2016). Critical discourse analysis: Definition, approaches, relation to pragmatics, critique, and trends. In A. Capone & J.L. Mey (Eds.) *Interdisciplinary Studies in Pragmatics, Culture and Society* (pp. 71-135). Switzerland: Springer International Publishing.

Weaver-Hightower, M.B. (2008). An ecology metaphor for educational policy analysis: A call to complexity. *Educational Researcher*, 37(3). 153-167. DOI: 10.3102/0013189X08318050

Webb, R, Vulliamy, G., Hamalainen, S., Sarja, A., Kimonen, E., & Nevalainen, R. (2004). Pressures, rewards and teacher retention: a comparative study of primary teaching in England and Finland. *Scandinavian Journal of Educational Research*, 48(2). 169-188.

Wodak, R. & Meyer, M. (2001). *Methods of Critical Discourse Analysis*. London: SAGE Publications Ltd.

Wiley, T.G., Garcia, D.R., Danzig, A.B., and Stigler, M.L. (2014). Introduction: Language policy, politics, and diversity in education. *Review of Research in Education*, 38. vii-xxxiii.

Zilliacus, H., Holm, G., & Sahlström, F. (2017). Taking steps towards institutionalising multicultural education—The national curriculum of Finland. *Multicultural Education Review*, 9(4), 231-248.

<https://doi.org/10.1080/2005615X.2017.1383810>