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KOREAN AND FINNISH TEACHERS' PERCEPTIONS REGARDING THE IMPLEMENTATION OF 21ST CENTURY COMPETENCIES AND RELATED INFLUENCING FACTORS

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SUMMARY

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For the last few years, new national core curricula incorporating the concept of 21st century competencies have been implemented in South Korea and Finland. This study aims to examine how the 21st century competencies are reflected in the Korean and Finnish curricula, and teachers' perceptions of implementing these 21st century competencies in practice, both in general and in relation to teacher autonomy and self-efficacy.

In the curriculum analysis, nine core concepts of 21st century competencies reflected in the curricula were derived and for these core concepts, it was examined how they were reflected in each curriculum. To investigate the teachers' perceptions, a questionnaire targeting primary teachers working in Jeju Province and Southwest Finland was conducted to investigate differences between the Korean and Finnish teachers' perceptions as well as relationships among the three concepts.

The findings revealed differences, not only in terms of the reflection ratios between the countries but also in Korean and Finnish teachers' perceptions of their actual implementation of the competencies. Also, Korean teachers' higher levels of belief regarding teacher autonomy and self-efficacy are associated with their higher levels implementation of 21st century competencies while this interconnectedness seems to be much less strong in Finland. Therefore, supporting teachers with lower perceived efficacy and autonomy might be a good approach to implement innovative ideas such as 21st century competencies in Korea, but not as much in Finland. Because of a variety of variations existing concerning the concepts, the results should be interpreted cautiously and comprehensively along with the particularity of the context.

Keywords: 21st century competencies, teacher autonomy, teacher self-efficacy, curriculum reform, curriculum implementation

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I. INTRODUCTION

1. Background and Purpose of the Study

In the last two decades, twenty-first century competencies have been discussed a lot in the field of education. Current society requires educational systems to equip students with a new set of competencies that are suited to the knowledge society where creating new knowledge is more valuable than its accumulation (Anderson, 2008; Voogt & Roblin, 2012; Ananiadou & Claro, 2009).

Accordingly, many frameworks regarding 21st century competencies were developed to identify core competencies by organizations such as the Organization for Economic Co-operation and Development (OECD), the European Union (EU), and the Partnership for 21st Century Learning (P21) (OECD, 2005; EU, 2006; P21, 2015). Also, many countries have made an effort to incorporate 21st century competencies into the educational standards by reforming curricula or even developing the first national curricula. (Ananiadou & Claro, 2009).

Responding to the emergence of the new phenomenon, both South Korea and Finland recently introduced the concept of the 21st century competencies in the newest version of national core curricula for basic education. These curricula are known as the National Core Curriculum for Basic Education 2014 in Finland (FNC 2014) and the National Core Curriculum for Basic Education 2015 in South Korea (KNC 2015).

However, differences concerning the incorporation of the competencies into the curricula exist between the two countries. In other words, along with the emergence of increased attention to competencies and challenging demands in 21st century, the underpinning values, needs, or culture of education in the context influence the process of the reform and choice of certain skills as valuable for 21st century (Gorden et al., 2009).

In Finland, seven transversal competence areas were introduced in FNC 2014: (T1) Thinking and learning to learn, (T2) Cultural competence, interaction, and self-expression, (T3) Taking care of oneself, managing daily life, (T4) Multiliteracy, (T5) ICT competence, (T6) Working life competence and entrepreneurship, (T7) Participation, involvement and building a sustainable future. The structure of the national curriculum was also altered to be presented by

grade unit instead of by the order of each subject corresponding to the central aim of the new curriculum; "integration of the knowledge and skills provided by different subjects to form meaningful wholes" (Finnish National Board of Education, 2016; Finnish National Agency for Education, 2016, p. 2).

In South Korea (hereafter referred to as Korea), to cultivate students with creativity and interdisciplinary ability, six core competencies were newly added in KNC 2015: (C1) Self-management, (C2) Knowledge and information management (C3) Critical thinking, (C4) Aesthetic and cultural sensitivity, (C5) Communication, (C6) Community competency. The amount of content presented was reduced focusing on core concepts in each subject to arrange the curriculum to integrate 21st century competencies (Korean Ministry of Education, 2015).

Nonetheless, these well-intended curriculum reforms do not guarantee the implementation of 21st century competencies into classroom practice. In the end, it is the teachers that will have to implement them in their classroom. This is why teachers have been considered as key agents in educational reform and innovation and why teachers' perceptions and willingness are crucial to foster 21st century competencies in learning, (Borko, 2004; Butler & Schnellert, 2012; Cerit, 2013).

Consequently, variations of teachers' implementation of 21st century competencies are inevitable. Some teachers make substantial changes to their teaching practice to incorporate the competencies while other teachers may not feel capable of the change, consider it not worthwhile to make the effort, or don't feel they have the agency to make changes. Thus, factors influencing teachers' actual perceptions should be considered instead of assuming teachers will be able to implement new curricula in the way intended by designers.

Teacher autonomy and teacher self-efficacy have been proven to be two of the most important factors to influence teachers' practice. According to many scholars, teachers' autonomy and self-efficacy beliefs are associated with educational reform initiative and willingness to implement innovative ideas (Guskey, 1988; Stein & Wang, 1988; Melenyzer, 1990; Short, 1994).

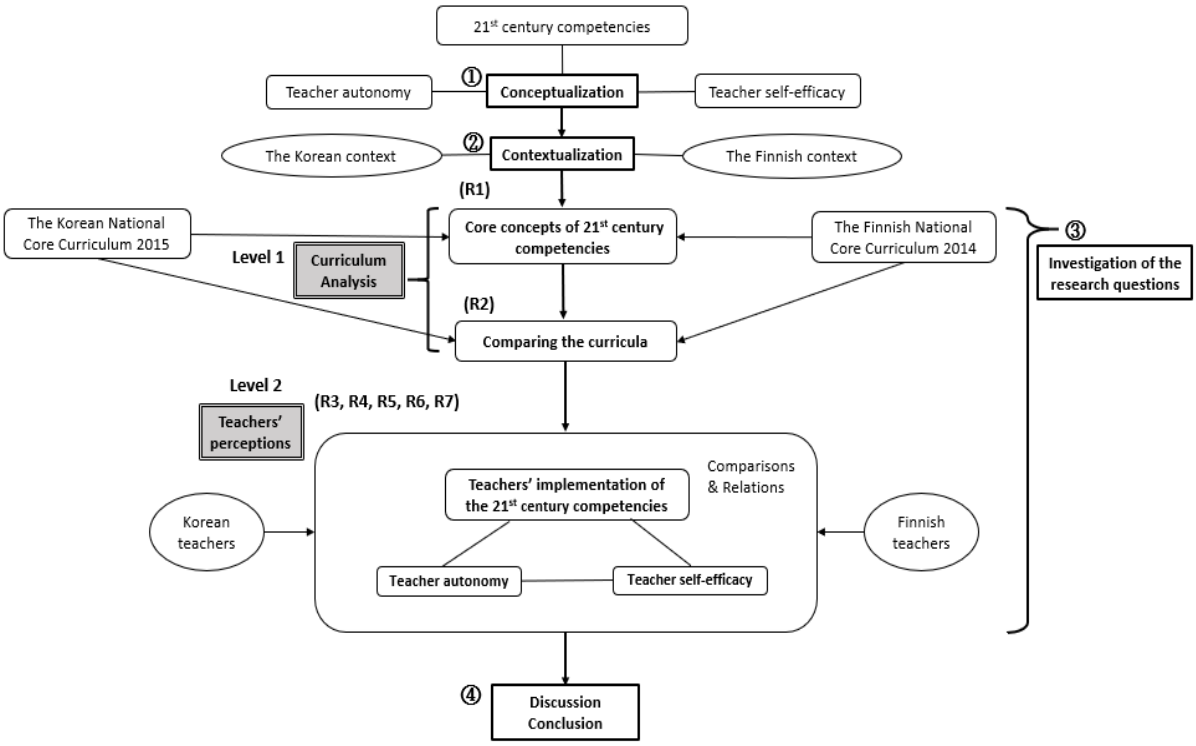
Those relations, however, do not exist in a vacuum. Instead, they are placed in a certain context constantly interacting with other internal and external influences such as teachers' lifestyle, roles, and other socio-cultural circumstances. In the current study, relations among the implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy

are investigated in Korea and Finland, which are two countries with a lot of similarities as well as distinctive differences regarding education. When the same phenomenon is investigated in two different contexts, findings of the study might have more implications to foresee the possible direction to solve existing issues or learn about ourselves better by comparison with others. (Phillips & Schweisfurth, 2014).

Therefore, the purpose of this study is to examine how the 21st century competencies are reflected in the Korean and Finnish curricula and teachers' perceptions of implementing these 21st century competencies in their classroom practices. Specifically, the current study aims to achieve this purpose by investigating relations among teachers' implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy. Comparisons between Korea and Finland regarding the topic are continuously drawn all through the process of the study. Together they provide insights in both the uptake of the curriculum reform in the respective countries and some implications on the need for support for teachers implementing innovative ideas such as 21st century competencies.

Figure 1

Research framework of the study modified from (Phillips & Schweisfurth, 2014, p.119)



2. Research Framework and Questions

As shown in Figure 1, this current study follows the structure for comparative inquiry (Phillips & Schweisfurth, 2014, p.119).

In the first stage termed conceptualization, the meaning and nature of the three concepts (i.e. 21st century competencies, teacher autonomy, teacher self-efficacy) are investigated.

The second stage is the process of contextualization which attempts to describe the situation related to the three concepts in the Korean and Finnish contexts. Through this process, the similarities and differences between the two contexts in terms of historical and socio-cultural backgrounds are examined. These two initial processes are presented in Chapter 2 (Theoretical Framework).

The third stage involves the investigation of the research questions which are framed in two levels: (1) Curriculum analysis, and (2) Teachers' perceptions. Seven research questions to examine are as follow:

Level 1. Curriculum analysis

- R1: What are the core concepts of 21st century competencies presented in the Korean and Finnish curricula?
- R2: What concepts of 21st century competencies were highlighted and emphasized in each curriculum?

Level 2. Teachers' perceptions

- R3: What are the differences between the Korean and Finnish teachers' perceptions of the implementation of 21st century competencies?
- R4: What are the differences between Korean and Finnish teachers' perceptions of teacher autonomy?
- R5: What are the differences between Korean and Finnish teachers' perceptions of self-efficacy?
- R6: How are teachers' perceptions of the implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy related?

- R7: Can teachers' autonomy and teachers' self-efficacy be factors to predict teachers' perceptions of the implementation of 21st century competencies?

In the first level of the investigation, using qualitative content analysis, the national core curricula of Korea and Finland (FNC 2014, KNC 2015) were analyzed to examine the core concepts of 21st century competencies reflected in the curricula (R1). Then, statements of objectives from the Korean and Finnish curricula were analyzed with a coding scheme derived from the previous part of curriculum analysis, and the results were then quantified to find which core concepts are highlighted and emphasized in each curriculum (R2). Together these two parts of curriculum analysis provide an in-depth understanding of 21st century competencies reflected in the curricula of the two countries. As national curricula reflect the countries' view on education they should be a major reference for actual teaching, which ideally should be reflected in the teachers' perceptions regarding the implementation of 21st century competencies in their classrooms.

This latter aspect is the focus of the second level of the investigation, that examines teachers' perceptions of the implementation of 21st century competencies. For this purpose, core concepts and descriptions of 21st century competencies derived from the curricula (FNC 2014, KNC 2015) were transformed into a 36-item survey with nine subscales representing the 21st century competencies. Because, as mentioned, teacher autonomy and efficacy are believed to be important factors for the uptake of curriculum changes, a teacher autonomy scale and teacher self-efficacy scale were constructed based on the scales developed by Pearson & Hall (1993) and Tschannen-Moran & Hoy (2001). Comparisons of the Korean and Finnish teachers' perceptions of the three concepts and their subscales, were done by collecting data with an online survey targeting primary teachers working in Jeju Province and Southwest Finland and conducting independent-samples t-tests and one-way ANOVAs (R3, R4, R5).

Furthermore, relations between teachers' perceptions of the implementation of 21st century competencies and the factors affecting teachers' perceptions are examined. Firstly, to see if and how teachers' perceptions of the implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy are related to each other, correlation analyses were performed (R6). Secondly, regression analyses were conducted to see if teachers' autonomy and self-efficacy can be predictors of teachers' perceptions of the implementations of 21st century competencies (R7).

The processes and results of these two levels are presented in Chapter 3 and Chapter 4.

Lastly, findings from the previous stages along with the implications and limitations of the study are discussed in Chapter 5.

II. THEORETICAL FRAMEWORK

1. Twenty-first century Competencies

1.1. Background

For several decades, twenty-first century competencies have drawn a lot of attention in the field of education. Many frameworks regarding 21st century competencies were developed to identify and define core competencies by organizations such as the Organization for Economic Co-operation and Development (OECD), the European Union (EU), and the Partnership for 21st Century Learning (P21) (OECD, 2005; EU, 2006; P21, 2015). Also, studies to review and compare those frameworks to find the similarities and differences were followed thereafter (Ananiadou & Claro, 2009; Dede, 2010; Voogt & Roblin, 2012).

Competency is not a new concept. Critical thinking and creative thinking skills labeled as 21st competencies in many frameworks have been argued and discussed by educators and philosophers since the time of Socrates. However, in the last two decades, the significance of the concept has been intensified because of changes in the world, especially in the labor market (Silva, 2009).

The current world has been characterized by globalization, advanced technologies, and knowledge society. Globalization and the development of information and communication technologies (ICT) have been transforming the present society into one of interconnection and interdependence. (OECD, 2005; EU, 2006; Voogt & Roblin, 2012).

Also, the concept of the knowledge society, a successor of the information society metaphor, has been mentioned a lot as one of the relevant contexts of the emergence of 21st century competencies. Knowledge society refers to a society in which knowledge functions as main assets and commodities. Moreover, in the knowledge society, knowledge is more than information or accumulation of knowledge, it also includes cognitive assets needed to interpret, process, make judgments and construct new forms of knowledge (Anderson, 2008; Voogt & Roblin, 2012).

These changes demand education to prepare students to be flexible and adaptable to the constantly changing labor market with resources that can be utilized in different situations. In

other words, core skills and competencies which can be flexibly used in a wide variety of contexts to meet important demands in the ever-changing world require incorporation in the education system (Anderson, 2008; Ananiadou & Claro, 2009).

1.2. Terminologies and definition of 21st century competencies

The terminologies and definitions of 21st century competencies vary in different frameworks and studies (Voogt & Roblin, 2012; Van de Oudeweetering & Voogt, 2018).

The term competencies have been interchangeably used with competences and skills related to 21st century learning. For example, competencies (OECD, 2005), competences (EU, 2006; Voogt & Roblin, 2012) and skills (Dede, 2010; P21, 2015) have been used in different frameworks and research.

Even though the word 'skills' has been widely used in the context of 21st century competencies, in many frameworks, the word 'skills' has been mentioned as merely one of the elements included in the concept of competencies. (e.g. "A competency is more than just knowledge and skills." from the OECD framework, "Competences are defined as a combination of knowledge, skills, and attitude" from the EU framework, "In general, at least in the early phases in Europe, competence was defined as going beyond skills acquisition") (OECD, 2005, p.4; EU, 2006, p.13; Gorden, 2009, p.35).

However, differences between the word 'competencies' and 'competences' are more subtle. Coming from the same Latin word '*competentia',* meaning meeting together, agreement, and symmetry, 'competence' refers to "the quality or state of having sufficient knowledge, judgment, skill, or strength", while 'competency' refers to "possession of sufficient knowledge or skill" or " a specific area of competence" (Competency, n.d.; Competence, n.d.). Both words have a highly similar meaning except the subtle difference that 'competency' has been used in describing a person's ability to perform a specific situation while 'competence' in a broader and general way including a person's skills, knowledge, or attitude (Ananiadou & Claro, 2009).

These two different sides of the meaning of the words, generality and specificity, were also captured in the definitions of 21st century competencies of different frameworks. For instance, competencies defined as "more than just knowledge and skills. It involves the ability to meet

complex demands, by drawing on and mobilizing psychosocial resources (including skills and attitudes) in a particular context." in the OECD framework, also similarly presented as "a combination of knowledge, skills, and attitudes appropriate to the context" in the EU framework. (OECD, 2005, p.4; EU, 2006, p.13).

As illustrated in the examples, the word contains the generality aspect of the meaning since it consists of knowledge, skills, attitudes, and behavior rather than narrowly defined skills. The other way, the specificity of the meaning was depicted because of the reason that it is involved with usage in a particular context.

Additionally, 21st century competencies have been characterized as being (a) multidimensional (i.e. competencies are comprised of knowledge, skills, and attitudes), being (b) flexible in a way that they can be broadly applied to certain situations adapting to the constantly changing demands of the world, and being (c) transversal (i.e. they can be utilized across many fields rather than related to a specific field) (Gorden, 2009; Voogt & Roblin, 2012).

Since 'competencies' and 'competences' respectively contain each side of the meaning, being multidimensional and being adaptable to certain contexts, both words were considered appropriate to use. Based on the results of searching the words with '21st century' using the Google Scholar, 'competencies' which had higher numbers of being used in the context of 21st century were chosen for the current study.

Considering crucial elements regarding 21st century competencies from other frameworks and research reviewed through the study, competencies were defined as;

Transversal abilities which are constructed of knowledge, skills, and attitudes to successfully meet complex demands in a particular context.

1.3. Core components of the 21st century competencies

Concerning the choice of what kinds of components have been included as core competencies for 21st century, commonalities were found from reviewing many frameworks such as OECD (2005), EU(2006), and P21(2015) (Mishra & Kereluik, 2011; Voogt & Roblin, 2012; Dede, 2010).

For instance, as mentioned in a meta-review, competencies such as ICT literacy, collaboration, communication, critical thinking, problem-solving, and cultural competencies were advocated by the majority of the frameworks (Voogt & Roblin, 2012).

Table 1

Overview of frameworks on 21st century competencies

EU (2006)	P21[1] (2015)	OECD (2005)	En Gauge[2] (2003)
-Communication	-Communication	-Ability to use language, symbols, and text interactively	-Basic, Scientific, Economic, and Technological Literacies
-Mathematical competence and basic competences in science and technology	-Collaboration	-Ability to cooperate	-Interactive Communication
			-Teaming, Collaboration, and Interpersonal Skills
-Digital competence	- ICT (Information, Communications, and Technology) Literacy	-Ability to use technology interactively	-Visual and Information Literacies
	- Information Literacy	-Ability to use knowledge and information interactively	
	- Media Literacy		
	-Critical Thinking -Problem Solving		-Higher-Order Thinking and Sound Reasoning
	-Creativity and Innovation -Flexibility and Adaptability		-Curiosity, Creativity, and Risk-Taking -Adaptability, Managing Complexity
			-Self-Direction
-Learning to learn			
-Sense of initiative and entrepreneurship	- Initiative and Self-Direction	-Ability to form and conduct life plans and personal projects	-Prioritizing, Planning, and Managing for Results
	- Productivity and Accountability		-Effective Use of Real-World Tools
	- Leadership and Responsibility		-Ability to Produce Relevant, High-Quality Products
		-Ability to assert rights, interests, limits, and needs ability to relate well to others	-Personal, Social, and Civic Responsibility
-Social and civic competences	-Social and Cross-Cultural Skills	-Ability to act within the big picture	-Multicultural Literacy and Global Awareness
		-Ability to manage and resolve conflicts	
-Cultural awareness and expression			

[1]Partnership for 21st century skills (2015), [2] Burkhardt et al. (2003).
Note. Constructed from EU (2006), P21 (2015), OECD (2005), and Burkhardt et al. (2003).

Especially, ICT literacy also called digital literacy or information literacy has been among the most mentioned competencies for 21st century (See Table 1). This implies that the current digital context involving the explosion of information triggered by advancing digital technology has facilitated the reconceptualization of literacies. In other words, in digital environments, skills to seek, evaluate, process information from different media and utilize the information as a source for producing new ideas has become vitally important (Ananiadou & Claro, 2009; Mishra & Kereluik, 2011).

Besides, collaboration, communication, critical thinking, and cultural competences were not new or unique skills that only emerged for 21st century. However, their implications have been altered to be more relevant to the digital environment and interconnectivity brought on from globalization (Mishra & Kereluik, 2011; Van de Oudeweetering & Voogt, 2018).

One the other hand, some competencies which were chosen for a certain framework were underemphasized by others. For instance, 'risk-taking' meaning "the willingness to make mistakes or tackle extremely challenging problems without obvious solutions" was only mentioned in the En Gauge framework (Burkhardt et al, 2003, p.33; See Table 1). Additionally, 'learning to learn' which was emphasized as one of the eight key competencies in the EU framework, was not explicitly mentioned in the other frameworks (EU, 2006).

Nonetheless, limitations exist in comparing different frameworks since each work has its way of grouping and categorization of 21st century competencies. To be more specific, even though some elements of competencies were mentioned in both of the frameworks to be compared, it does not necessarily mean that those were correspondingly meant by the two frameworks. To resolve this issue, synthesizing and reconstructing categories rather than merely examining categories and subcategories are necessary.

Therefore, to investigate and compare 21st century competencies reflected in the new curricula in South Korea and Finland, 21st century competencies were reconceptualized by qualitative content analysis of the curricula. Further details will be presented in Chapter 3.

2. Teacher Autonomy

Autonomy originated from the Greek word 'autonomos' which is a combination of 'auto' meaning 'self' and 'nomos' meaning 'law or rule'. Additionally, it is defined as a self-

governing state or self-directing freedom according to the Merriam-Webster dictionary (Autonomy, n.d.).

The root of autonomy also can be found in Kant's work which greatly affected the notion of autonomy concerning education (Nelson, 2018). Kant viewed autonomy, which was also referred to as 'moral autonomy' or 'autonomy of the will', as "a property of the rational will with implications for the nature of morality" (Reath, 2006, p.6). Distinguished with the word 'heteronomy' meaning actions ruled by a force outside the individual, for Kant, autonomous beings use their rationality to make their moral laws and judgments (Nelson, 2018; Reath, 2006).

The most dominant meaning of autonomy, self-rule or self-direction, has been widely adopted to the field of education in various ways depending on different viewpoints regarding education (Nelson, 2018). Some important studies presenting autonomy with different perspectives in education should be reviewed to specify the meaning and characteristics of teacher autonomy.

First, in self-determination theory, autonomy was indicated as one of the three basic psychological needs along with competence and relatedness to maintain one's intrinsic motivation. Deci and Ryan (2000) pointed out that "autonomy concerns the experience of integration and freedom" rather than just ideas of independence or individualism from control. (p. 231). In addition, autonomy refers to "the experience of behavior as volitional and reflectively self-endorsed" (Niemiec & Ryan, 2009, p.135). Applying these conceptualizations to teacher autonomy, teachers are autonomous when they have discretion regarding teaching content, methods, and strategies following their educational philosophy and beliefs (Skaalvik & Skaalvik, 2014).

However, when linked to the nature of the works and its social context, the taken-for-granted meaning of professional autonomy can be challenged (Pit& Phelan, 2008). To be more specific, one of the working definitions of autonomy; "independence from external influences and freedom of will" can face dilemmas with professional contexts such as being a teacher (Pitt & Phelan, 2008; Pitt, 2010, p. 2). For example, teachers may pursue their autonomy by making a judgment of individual student needs with specialized knowledge and skills. On the other hand, teachers may have to be incorporated with the situation (e.g. prescriptive and outcome-based curricula, and standardized tests) that constrains their autonomy (Pitt &

Phelan, 2008; Pitt, 2010). Therefore, Hoyle and John's definition of teacher autonomy as cited in (Parker, 2015) makes a strong point regarding teacher autonomy.

'a positive form of autonomy represents a teacher's freedom to construct a personal pedagogy which entails a balance between personality, training, experience and the requirements of the specific educational context' (Hoyle and John, 1995, as cited in Parker, 2015, p.21*).*

Concerning this relation between teachers' judgment and demands in a certain educational context, teacher autonomy is a matter of *degree* rather than a dichotomy of 'autonomy' vs. 'no autonomy' since teachers can't be perfectly isolated from external influences and pressures. (Ryan & Deci, 2006). Moreover, according to Person & Hall (1993), teacher autonomy is teachers' *perceptions* of "whether they control their work environments" (p. 173).

Also, there have been many empirical studies to find the link between teacher autonomy and other factors such as teacher motivation, job satisfaction, stress, and empowerment (Pearson & Moomaw, 2005; Brunetti, 2001; Kim & Loadman, 1994; Klecker & Loadman, 1996; White, 1992; Short & Rinehart, 1992). According to the studies, teacher autonomy is one feature of teacher motivation (White, 1992) and empowerment (Klecker & Loadman; 1996 Short & Rinehart, 1992), also associated with teachers' burnout and job satisfaction (Pearson & Moomaw, 2005; Brunetti, 2001; Kim & Loadman, 1994).

Furthermore, scholars have argued that curriculum autonomy is positively related to educational reform initiatives (Melenyzer, 1990; Short, 1994), they also pinpointed the significance of teacher autonomy in curriculum implementation (Kennedy, 1992). In other words, the implementation of the new curriculum should be done along with allowing teachers to take initiative in curriculum development and enhancing teachers' autonomy (Öztürk, 2011).

3. Teacher Self-efficacy

The concept of teacher self-efficacy is theoretically grounded in Bandura's social cognitive theory, emphasizing key factors of human agency that influence what people do. (Tschannen-Moran & Hoy, 2001; Skaalvik & Skaalvik, 2007). One of the factors, perceived self-efficacy,

refers to "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments." (Bandura, 1997, p3). According to Bandura (1997), people's beliefs in self-efficacy is the main basis of behaviors and actions. To be more specific, such beliefs determine whether they initiate a set of actions to achieve a certain goal, how much effort they put in, how long they persist in those actions despite obstacles and failures.

Based on Bandura's work, teacher self-efficacy can be conceptualized as teachers' beliefs in their ability to organize and practice activities needed to accomplish given educational goals (Bandura, 1997; Skaalvik & Skaalvik, 2007). More specifically, it can be defined as teachers' judgment of their capabilities to have a positive effect on student learning and engagement even those who may be unmotivated or difficult to manage (Guskey & Passaro, 1994; Soodak & Podell, 1996).

Despite the relatively simpler idea of this concept, when it comes to measurement, a great deal of confusion has existed with finding the right dimensions for measuring teacher self-efficacy (Tschannen-Moran & Hoy, 2001). In other words, over the last five decades, measurements of teacher efficacy have been developed, altered, examined in many different ways by numerous researchers (Armor et al., 1976; Gibson & Dembo, 1984; Hoy & Woolfolk, 1993; Woolfolk & Hoy, 1990; Guskey & Passaro, 1994; Tschannen-Moran & Hoy, 2001; Skaalvik & Skaalvik, 2007).

To capture this construct, researchers have approached it from two different theoretical bases; Rotter's (1966) the concept of internal and external control, and Bandura's (1997) self-efficacy and outcome expectancy (Tschannen-Moran & Hoy, 2001). For example, based on Rotter's work, the Rand researchers conceptualized teacher efficacy as teachers' levels of belief that they could control the reinforcement of their actions, that is, whether the reinforcement exists outside the teachers' control (external) or lies within their control (internal) (Tschannen-Moran & Hoy, 2001; Armor et al., 1976). In their research (Armor et al., 1976), two items respectively representing external and internal factors were used to measure teacher self-efficacy and they are as follows: (a) "When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment" and (b) "If I really try hard, I can get through to even the most difficult and unmotivated students." The first item evaluating the extent to which teachers' beliefs about the power of teaching or teachers in general compared to external factors was also labeled as general teaching efficacy (Hoy & Woolfolk, 1993; Kurz & Knight,

2004) and teaching efficacy (Gibson & Dembo, 1984). On the other hand, the second dimension of teacher self-efficacy indicating teachers' individual confidence in their abilities to overcome obstacles for student learning was referred to as personal efficacy (Guskey & Passaro, 1994) and personal teaching efficacy (Hoy & Woolfolk, 1993; Gibson & Dembo, 1984; Kurz & Knight, 2004).

Also, Bandura's self-efficacy(efficacy expectation) and outcome expectancy, respectively meaning the individual's judgment that she or he can manage and execute actions required in a given situation, and the individual's estimate of the likely consequence such actions will produce, were used as the structure of teacher self-efficacy (Bandura, 1997; Tschannen-Moran & Hoy, 2001). For instance, Gibson and Dembo (1984) asserted that two dimensions emerged from their research corresponded to the two expectancies of Bandura's social cognitive theory. Regarding outcome expectancy, Gibson and Dembo (1984) assumed that what teachers in general expected to be able to attain was the outcome of individual teachers' expectations of what they can do in their teaching. However, Bandura pinpointed that an outcome expectancy is a judgment of the likely consequence of a certain performance with an individual's assessment of the expected level of performance. Moreover, outcome expectancy has little impact on motivation since the outcome that an individual expects primarily comes from the person's beliefs in his or her expected ability of the performance.

Recognizing the issues of existing teacher self-efficacy measurements being inconsistent with the factor structure, Tschannen-Moran and Hoy (2001) developed a new measure of teacher efficacy; the Ohio State Teacher Efficacy Scale (OSTES) based on Bandura's unpublished measure (Bandura, n.d.).

Bandura underscored the characteristics of self-efficacy being contextual and multifaceted emphasizing that efficacy scale should reflect particularized task demands within a given activity domain (Bandura, 1997). Following Bandura's idea, 24 items (12 items for a short version) with the three dimensions representing important task demands and elements regarding teaching and teachers' works, were developed by Tschannen-Moran and Hoy (2001). For the current study, the short version of OSTES was used and further details will be presented in Chapter 4.

Despite the issue of the measurements, teacher self-efficacy has been a considerably fruitful concept to investigate in the field of education. In other words, for almost half a century, many studies on teacher self-efficacy have been produced with significant implications about

teaching practices and students' learning (Tschannen-Moran and Hoy, 2001). For example, teachers' perceptions of self-efficacy have been shown to be related to student achievement and motivation (Armor et al., 1976; Ross, 1992; Mojavezi & Tamiz, 2012), teacher burnout (Skaalvik & Skaalvik, 2010; Schwarzer & Hallum, 2008), teacher autonomy (Skaalvik & Skaalvik, 2014), job satisfaction (Klassen & Chiu, 2010; Skaalvik & Skaalvik, 2014; Türkoğlu, Cansoy & Parlar, 2017), and teacher engagement (Skaalvik & Skaalvik, 2014; Simbula, Guglielmi & Schaufeli, 2011). Moreover, teachers with a high level of self-efficacy are more likely to be open to new ideas and willing to implement innovative methods to meet students' needs (Guskey, 1988; Stein & Wang, 1988).

4. Educational Contexts in South Korea and Finland

4.1. The development of the educational systems

Both South Korea and Finland have placed high values on education and education played a key role in the transformation from impoverished post-war nations (i.e. the Korean War: 1950-1953, the Finnish Continuation War: 1939-1944) to highly industrialized nations well known as having good education systems (Jones, 2013; Seth,2012; Sahlberg, 2015). In other words, both countries accomplished delayed and compressed modernization by expanding educational attainment from primary level to secondary and tertiary level.

Finnish compulsory education for primary level started in 1921 while Korea initiated it in 1954 and completed in 1959 (Simola, 2015; Kim, 2002). Also, in the 1970s, the new comprehensive school system (peruskoulu) ensuring all students, regardless of their socio-economic status, attended the compulsory 9-year basic education governed by public authorities was implemented. Afterward, the reform of teachers' training system followed with important changes from seminars and colleges of teacher education to the new educational faculties in universities with master's degree requirements. These decisions were associated with the principles of social justice and equality which have been continued to be the main values in Finnish education. (Sahlberg, 2015).

The school system in Korea which consists of six years of primary school, three years of middle school, three years of high school, and four years of university originated from educational reforms by the U.S. Military Government (1945-1948) (So, Kim, & Lee, 2012).

After the compulsory primary education was accomplished in 1959, intensified competition for entering elite middle schools and increasing private tutoring became a social issue. For that reason, the Korean government abolished entrance examinations to middle school in 1969 ensuring students could go to middle schools within their districts. After this equalization policy, access to secondary education expanded during the 1960s and 1970s. Subsequently, free, compulsory education in the middle school level started in 1985 in rural areas and affected the whole country in 2002. Regarding the teacher training system, the unsystematized two-year college level was changed into the 4-year university level in the 1980s (Kim, 2002; Lee, Kim & Byun, 2012).

4.2. National core curricula and curriculum development

The purpose of the core curriculum is to promote the equality and high quality of education by steering the equal provision of education and managing educational change properly. Sharing this same goal, both South Korea and Finland have continuously developed and revised the national core curricula since the establishment of compulsory education (i.e. compulsory education of primary level: 1921 in Finland, 1959 in South Korea). (Finnish National Board of Education, 2016; Korean Ministry of Education, 2015). Although in the early stage the national core curricula were strongly centralized, since the decentralization process, the structure of curriculum development consisting of three levels (i.e. national core curriculum, local curriculum, and school curriculum) was set up in both countries. While the national core curriculum provides a common structure, basic guidelines, and regulations, the local and school curricula are more context-driven meaning that they are developed by taking into account the students' needs and special features in the local and school context. By having this structure of curriculum development, both countries intended to allow municipalities, schools, and teachers more curriculum autonomy to reflect students' individual needs for learning (Vitikka, Krokfors, & Hurmerinta, 2012; Finnish National Board of Education, 2016; Korean Ministry of Education, 2015). Nonetheless, the process of operating this system or teachers' perceptions of curriculum autonomy might be different in the two countries.

In Finland, networking, and collaboration have been a driving force for the process of curriculum development. Finnish people are known as being willing to work with others with low hierarchic relationships and those characteristics were indicated as some of the main

reasons for the high-quality Finnish education system (Sahlberg, 2015). For example, making the national core curriculum was not a process only determined by administrators. The work was coordinated by the National Board of Education, but educational professionals, parents, researchers, and other stakeholders also participate in the process and their views have been taken into account. Moreover, education providers are asked to provide feedback on the curriculum during the process. In this way, the Finnish national core curriculum has been the result of a collaborative effort between different educational stakeholders rather than just guidelines and regulations. Also, this well-functioning tradition of collaboration and networking has become a central part of curriculum development at the local and school level enhancing educational providers' involvement and ownership of the curriculum with a great deal of autonomy (Vitikka, Krokfors, & Hurmerinta, 2012).

On the other hand, in South Korea, a clear gap exists between curriculum autonomy presented in the curriculum document and curriculum autonomy perceived and managed by educators in practice. In other words, Korean teachers tend to perceive curriculum autonomy as 'forced autonomy' meaning another form of regulation they have to comply with (Kim & So, 2014). In fact, since the reform emphasizing decentralization regarding curriculum (i.e. national core curriculum, local curriculum, and school curriculum), the number of regulations and guidelines about curriculum autonomy has increased (Kim, 2018). This might imply that both the educational system and teachers are still constrained to hierarchical structure with the centralization of power even though decentralization and curriculum autonomy is clearly indicated in the document. It is worthwhile to discuss some of the historical, socio-cultural factors related to the top-down administration structure or hierarchical relationships between people in Korea.

Korea was ruled by a royal dynasty until the early 20th century and the dominant values of education were closely related to Confucianism which emphasizes loyalty to the king, reverence of the elderly by the young, and filial duty to one's parents. These Confucian values functioned as ideological tools to maintain the royal authority and status system until the end of the Chosun Dynasty (1910) (So, Kim, & Lee, 2012). According to Schwartz (2006), Confucian influenced countries exhibit more hierarchy and less egalitarianism compared with other regions such as the European and American cultures. Furthermore, these hierarchical cultures originating from Confucianism has been solidified through historical circumstance (e.g. Japanese occupation: 1910-1945, military dictatorships: 1961-1992) affecting both

centralized administration system and vertical relationships between superiors and subordinates (So, Kim, & Lee, 2012; Kim, Lee, Hong, Hwang, Lee & Kim, 2013).

Nonetheless, in the recent decade, in opposition to the hierarchical education administration system, there has been a new school improvement initiative called Hyukshin (i.e. the Korean word meaning 'innovation') School movement in Korea. Hyukshin schools are public schools that are intended to employ progressive and democratic practices where educational practitioners have a greater influence on school curriculum and development (Sung & Lee, 2018). The efficacy of new movements like Hyukshin is still being researched.

4.3. High academic achievements with distinctive features

Since the first results of the Programme for International Student Assessment (PISA) revealed in the 2000s, South Korea and Finland have become well known for students' high achievement on the assessment. For example, in 2003, Finland and South Korea ranked respectively 1st and 2nd in Reading, 2nd and 3rd in Mathematics, and 1st and 4th in Science (Adams, 2003). Although the rankings of the two countries have gone down since the early report, they are still among the most well-performing countries (OECD, 2019). Despite these similarly high results of the two nations, several distinctive features also can be found from them.

In Korea, traditionally, education and formal learning have been perceived as a way of achieving status and power (Seth, 2012). As the attainment in higher education increases, entrance to the few prestigious so-called 'SKY universities' has become a precondition to achieve a higher level of economic and social status. This prestige orientation has made the educational environment more competitive focusing more on the academic results than learning itself. And it is closely associated with the prevalence of shadow education which means supplementary private tutoring to provide additional support outside of school (Choi, & Choi, 2016; Byun, Schofer & Kim, 2012; Byun,2014; Lee & Shouse, 2011). In 2018, 82.5% of elementary school students and 69.6% of middle school students received at least one or more forms of shadow education. And the weekly participation hours recorded 6.2 hours per student including all three levels (i.e. elementary, middle, and high school) (Korea National Statistical Office, 2018).

In the Finnish education system, development has been emphasized more than competition and comparison (Voogt & Kasurinen, 2005). Except for the matriculation examination at the end of upper secondary education, there never has been any national examinations (Hautamäki & Kupiainen, 2014; Voogt & Kasurinen, 2005). Instead, student self-assessment has been frequently used to support students' development of learning to learn competencies and help students to feel responsible for their own learning (Voogt & Kasurinen, 2005). Since the first framework for evaluating educational outcomes in 1995 by the Finnish National Board of Education, learning to learn competencies has seen as common pedagogical goals regardless of any kind of subject (Hautamäki & Kupiainen, 2014). Also, 'thinking and learning to learn' was presented as one of the seven transversal competencies in the Finnish National Core Curriculum for Basic Education 2014 (Finnish National Board Education, 2016). Also, educational institutions in Finland are predominantly publicly funded. Household expenditure constitutes only 1% of all educational expenditure in Finland while 12% in South Korea (7% in OECD average) at the primary, secondary, and post-secondary levels (OECD, 2018). Furthermore, the Finnish context lacks private tutoring commonly used in many countries including South Korea (Sahlberg, 2015).

4.4. Teachers in South Korea and Finland

In both South Korea and Finland, teachers have a high level of status, and teaching is a prestigious profession especially for young females. The percentage of female teachers in primary schools is 78% in South Korea and 79% in Finland (OECD, 2018). Primary school teachers' salaries are similar at the starting point of the career, which are 32,485 US dollars in South Korea and 33,915 in Finland. And the rate of the salary increase depending on years of experience is higher in South Korea. (primary teachers' salary with 15 years of experience: 57,179 US dollars in South Korea, 42.180 in Finland) (OECD, 2018). In both countries, class teachers are generalists and they teach all subjects in primary schools. Also, they have various tasks such as teaching, preparation of lessons, student counseling, and general administrative work (Paronen & Lappi, 2018). One notable difference concerning teachers' task is that Korean teachers spend more hours on general administrative work such as paperwork, communication, and other clerical duties. According to TALIS 2013 results, Korean teachers spent 6 hours per week on administrative work while Finnish teachers spent just 1.3 hours on it. (OECD average: 2.9 hours, lower secondary level) (OECD, 2014). The ratio of students to

teaching staff in primary education is under the OECD average (15) in Finland (13) and over the OECD average in South Korea at 16 (OECD, 2018).

In the 1990s, both countries encountered significant changes economically and politically. In 1992, Korea elected the first president of civil government after a period of the military dictatorships followed by the International Monetary Fund crisis in 1997. Finland also had an economic crisis in the early 1990s and became a member of the European Union (EU) in 1995. Also, in this period, neoliberal logic influenced educational reforms in many countries, and they affected teachers' work significantly.

In South Korea, the government implemented a series of market-based educational policies such as performance-based bonus pay (introduced in 2001) and the teacher evaluation system. Those new policies were used as a means of improving teachers' accountability and the quality of teachers though competition and assessment to strike negative reputations of public schools and continuously increasing house expenditure on private tutoring (Cho & Park, 2016; Yoo, 2018).

The Korean teacher evaluation system was originally related to a teacher's performance rating for promotion mainly through evaluations by the principal and vice-principal of the school. Because of the criticism of the traditional system failing to promote teachers' professional development, the new teacher evaluation system was introduced in 2006 and fully implemented in 2011. With this new system, teachers are evaluated by multiple evaluators such as school principals, colleagues, parents, and students (Cho & Park, 2016; Yoo, 2018). The teacher evaluation system resulted in fierce debate among educational stakeholders in South Korea, and whether the system fosters teachers' professional learning and growth remains questionable (Yoo, 2018).

On the other hand, Finland has not followed the global accountability movement in education aiming at making teachers more accountable for their performance. Instead, in the 1990s, there was a movement to improve the school by encouraging teachers to explore a concept of knowledge and learning and develop their teaching methods rather than applying external accountability structures. Schools and teachers were granted a great degree of autonomy with collective responsibilities which were formed by networking and collaborating with other schools, teachers, and parents. (Sahlberg, 2007, Sahlberg, 2008, Sahlberg, 2011, Sahlberg, 2015; Webb et al., 2009). School inspection was abolished in the early 1990s, and there is no

evaluation of teachers on an individual basis. (Sahlberg, 2015; European Commission/EACEA/Eurydice, 2015).

III. CURRICULUM ANALYSIS

1. Core Concepts of 21st century Competencies in the Curricula

1.1. Method

To examine the core concepts of the 21st century competencies (R1), an inductive approach was applied in this research. Such an approach means that the national core curricula were analyzed without imposing any preconceived concepts from other frameworks such as OECD (2005) and EU (2006). This decision was made based on the following reasons. First, there were too many frameworks with different foci. Choosing one framework could result in a limited vision of the concept, choosing many would require analyzing and synthesizing these frameworks first. This would in a way also be redundant, as the skills in the national curricula are the result of synthesizing many frameworks rather than a single one. Second, if the 21st century competencies were reflected differently in the national curricula based on the context or values in each country, this provides important information on the views on 21st century skills that are conveyed through the curriculum.

Since analyzing the whole national core curricula would be beyond the scope of this research, the two curricula (FNC 2014, KNC 2015) were reviewed to highlight what the 21st century competencies mean in the two countries. In this research, descriptions of the 21st century competencies in each curriculum were selected based on the following reasons. First, the descriptions were intentionally developed by curricula designers to inform education stakeholders of the meaning and explanation of the 21st century competencies. Second, in both countries, the descriptions were constructed in a rather similar format with condensed information about the 21st century competencies.

These two selected parts (i.e. descriptions of 21st century competencies from the KNC 2015 and the FNC 2014) were analyzed using qualitative content analysis to synthesize the core concepts of the 21st century competencies. As mentioned by Hsieh, & Shannon (2005), the qualitative content analysis extends beyond only counting words or organizing text more

efficiently, rather it provides broader and deeper insight into the phenomenon by interpreting the meaning subjectively and identifying patterns of the content systematically.

1.2. Data analysis

Modifying the process of the conventional content analysis from Hsieh & Shannon (2005), this analysis was conducted in four stages: reading as a whole, open coding, grouping and categorization, and defining the categories.

In the first stage (i.e. reading as a whole) all of the selected data, which were descriptions of 21st century competencies in the two different national curricula, was read as one would read a novel. The purpose of this stage was to gain a holistic picture of the overall data before coding. After reading as a whole, numerous similarities were found between the two curricula. For example, many competencies, such as communication competency, self-oriented learning, and cultural competency were detected in both curricula even though they were grouped or named in different ways.

In the second stage (i.e. open coding), the data was read word by word to derive codes. Statements that were considered relevant to capture the key concept of 21st century competencies were highlighted with color. Statements to be included in the same category of competencies were underlined with the same color. In this stage, six different colors were used to highlight the statements, and those color codes formed an initial sense of categorization. Additionally, keywords or short descriptions of the statements were added in the margin of the paper. This stage was repeated until there were no more changes made.

In the third stage, the data was read through again for grouping and categorization. Highlighted notes and headings written in the margin of the text from the previous phase became the source of preliminary codes. Accordingly, considering the key concepts of 21st century competencies, a great number of codes were formed and collected on a new file. Such codes ranged from ‘to recognize problems through logical and critical thinking’ to ‘to develop their learning strategies’ and more. Then, codes were organized into categories based on how different codes were linked and related. At this phase, whether all aspects of each category were described and covered was examined cautiously. Initially, six categories emerged from the data. These categories were Self-Management, Knowledge and Information Management, Creative Thinking, Cultural competency, Communication and collaboration, and Community.

Thereafter, three subcategories of Self-Management, which were Self-regulated Learning, Self-Care, and Working-Life became the main categories. Additionally, Knowledge and Information Management was split into two different categories, which were ICT competency, and Problem-solving & Critical thinking. This decision was made to demonstrate the characteristics of each category distinctly for the next part of the analysis. In other words, to compare which concepts of the 21st century competencies were emphasized in each curriculum, the categories that were more highlighted in one of the countries such as Self-Care and Working Life should be prominent. Later on, Self-Care and Problem-solving & Critical thinking were respectively changed to Self-Management and Knowledge & Information Management which were considered to better fit the concept. Thus, nine categories were generated which were Self-regulated Learning (SL), Self-Management (SM), Working Life (WL), Knowledge and Information Management (KIM), ICT competency (ICT), Creative Thinking (CT), Cultural competency (C), Communication and Collaboration (CC), and Community (CO).

However, reading through the original text while keeping the nine categories in mind, issues of ambiguity were detected. To elaborate, since most of the categories were interconnected, it was considerably difficult to draw a clear line of whether some of the codes were included in one category or the others. For example, 'human rights' could be included in either Cultural competency or Community. Moreover, statements about 'social skills' could be included in either Self-Management or Communication and Collaboration. For this reason, it was greatly important to develop clear descriptions of the categories for the high reliability of the analysis.

In the final stage of the data analysis, descriptions of nine categories were established. Subcategories and codes from the previous stage were then modified and added to the updated description sheet to cover all components of each category and to avoid ambiguity. To evaluate the reliability of the process, descriptions of the respective category were checked by four different observers. To be more specific, each description was reconnected to one of the categories by the observers who were only given basic information about the process. A few disagreements among the observers and the researcher were resolved by revising some of the descriptions to strengthen the clarity of the statements. For example, "To be adaptable and flexible to the changing world" was revised to "To be mindful of how the world and job market is changing" to strengthen the connection with the other three descriptions of Working Life (WL). Also, "To analyze topics critically from different viewpoints" regarding

Knowledge and Information Management (KIM) was altered to "To analyze topics critically" to draw a line between Knowledge and Information Management (KIM) and Creative Thinking (CT).

Table 2

Core concepts and descriptions of 21st century competencies derived from the curricula

Core concepts	Description	Relevant concepts from other frameworks
Self- regulated Learning (SL)	• To set goals, plan their work, assess their learning progress • To recognize their personal way of learning and develop their learning strategies • To maintain motivation, confidence, and joy of learning • To perceive learning as a lifelong process	- Learning to learn (EU, 2006) - Self-directed Learners (P21, 2015) - The ability to form and conduct life plans and personal projects (OECD, 2005)
Self-Management (SM)	• To manage their health, safety, well-being • To manage their own daily life (finance, leisure, consumption, time management, etc.) • To manage personal emotions and self-esteem • To establish self-identity	- The ability to form and conduct life plans and personal projects (OECD, 2005)
Working Life (WL)	• To have an interest and a positive attitude towards working life • To understand the significance of work and entrepreneurship • To identify their vocational interests and develop skills for their future career • To be mindful of how the world and job market is changing.	- Sense of initiative and entrepreneurship (EU, 2006) - Flexibility and adaptability (P21, 2015)
Knowledge and Information Management (KIM)	• To analyze topics critically • To seek, evaluate, modify, and process knowledge and information • To utilize knowledge and information for problem-solving, argumentation, reasoning, drawing of conclusions • To evaluate their argumentation, conclusions, and solutions	- The ability to use knowledge and information interactively (OECD, 2005) - Critical thinking and problem-solving (P21, 2015) - Information literacy (P21, 2015)
ICT competence (ICT)	• To familiarize with various ICT applications • To understand the significance and risks of ICT in their life • To use ICT responsibly, safely.	- Digital competence (EU, 2006) - ICT literacy (P21, 2015)

	• To develop their practical ICT competence in producing their own work.	- The ability to use technology interactively (OECD, 2005)
Creative Thinking (CT)	• To think outside of the box and be open to new and diverse perspectives • To create new and innovative ideas • To elaborate and develop their ideas • To fuse knowledge, skills, and experience in various areas and use them to create new ideas	- Creativity and innovation (P21, 2015)
Cultural Competence (C)	• To understand their social, cultural and linguistic roots • To understand cultural diversity and respect others • To be open to various cultural values • To recognize the significance of art, culture and cultural heritage	- Cultural awareness and expression (EU, 2006) - Social and cross-cultural skills (P21, 2015)
Communication and Collaboration (CC)	• To understand and respect other's opinions • To express their opinions and feelings effectively in various situations. • To interact and cooperate with other people to strive for a common goal • To have negotiation and conflict resolution skills	- Communication in the mother tongue and foreign languages (EU, 2006) - Ability to use language, symbols, and text interactively, ability to relate well to others, ability to cooperate, ability to manage and resolve conflicts (OECD, 2005) - Communication and collaboration (P21, 2015)
Community (CO)	• To recognize and participate in solving various issues in the society and the global community (environment, equity, justice, human right, etc.) • To learn to become active citizens who use their rights and freedom responsibly • To understand the significance of rules, agreements, and trust in society • To learn to contribute to a sustainable development	- Social and civic competences (EU, 2006)

1.3. Results

As shown in Table 2, the final version of core concepts and descriptions of 21st century competencies derived from the national core curricula (FNC 2014, KNC 2015) were indicated. Moreover, several relevant concepts from other frameworks such as OECD (2015) and EU (2006) were found to support the assumption that 21st century competencies in the

national curricula are the results of synthesizing other frameworks. This set of 21st century competencies were utilized as a coding scheme to compare the subject area of the respective curriculum, which were presented in the next part of curriculum analysis.

2. Comparing the Curricula

2.1. Method

The second step of the curriculum analysis involves highlighting core concepts that are emphasized in each curriculum (R2). Both the Korean and Finnish national core curricula consist of two main parts which are a general part with the mission, values, and structure of education and a more practical part with the objectives and core content of teaching for subjects.

To select samples to compare the two curricula (FNC 2014 and KNC 2015), the subject area of each respective curriculum was reviewed entirely based on how the core concepts of the 21st century competencies were presented in the practical part of the curricula. Subsequently, mother tongue, social studies, and ethics were selected since those contain the core concepts of 21st century competencies more than other subjects such as mathematics and music. Moreover, those subjects were introduced to similar age groups in both countries with relatively equivalent content structure. Afterward, religion was also added in the list for the reason that in the Finnish context, students are supposed to choose either ethics or religion.

Table 3

Statements of objectives in the Korean and Finnish curricula

<table>
<tr><td></td><td colspan="3">Objectives (Number of Statements)</td></tr>
<tr><td>Subject</td><td>The Korean Curriculum</td><td>The Finnish Curriculum I</td><td>The Finnish Curriculum II</td></tr>
<tr><td>Mother tongue</td><td>Korean Language (3rd~6th grade) (57)</td><td colspan="2">Finnish Language and Literature (3rd~6th) (15)</td></tr>
<tr><td rowspan="2">Social studies</td><td rowspan="2">Social studies & History (3rd~6th) (72)</td><td colspan="2">Social studies (4th~6th) (9)</td></tr>
<tr><td colspan="2">History (4th~6th) (11)</td></tr>
<tr><td>Ethics</td><td>Ethics (3rd~6th) (24)</td><td>Ethics (3rd~6th) (10)</td><td></td></tr>
<tr><td>Religion</td><td></td><td></td><td>Religion (3rd~6th) (12)</td></tr>
</table>

Total	153 statements	45 statements	47 statements
		57 statements	

Furthermore, only statements of achievement objectives in the Korean curriculum and objectives of instruction in the Finnish curriculum from those four subjects (i.e. mother tongue, social studies, ethics, and religion) were extracted for the study. This decision was made for the reason that objectives show the essence of what teachers are supposed to teach and what students need to learn. This initial review resulted in 153 statements, or sentences, from the Korean Curriculum, 45 statements from the Finnish Curriculum (I) including ethics, mother tongue, and social studies, and 47 statements from the Finnish Curriculum (II) with religion instead of ethics, and the two other subjects (See Table 3).

These samples were analyzed with both deductive content analysis and quantitative content analysis. Deductive content analysis is a form of category application based on categories development of R1 rather than other previous theories or frameworks. After coding the data based on a coding scheme derived from the first step of the curriculum analysis, quantitative content analysis was performed to quantify the reflection ratio in the two curricula and to compare the results.

2.2. Data analysis

Modifying the step model of deductive category application from Mayring (2000), the selected objectives (i.e.153 statements written in the Korean language from KNC 2015 and 57 statements written in English from FNC 2014) were analyzed with four stages: constructing a coding frame, initial coding to establish coding rules, coding, and checking of reliability and revision.

Table 4

Example of the coding frame

Category	Descriptions	Examples
Self-regulated Learning (SL)	- To set goals, plan their work, assess their learning progress - To recognize their personal way of learning and develop their learning strategies	- To guide the pupil to plan and assess his or her learning (Ethics, Finnish Curriculum)

	- To maintain motivation, confidence, and joy of learning - To perceive learning as a lifelong process	- Students check their reading habits and read texts that they find themselves. (First language, Korean curriculum)
Self-Management (SM)	- To manage their health, safety, well-being - To manage their own daily life (finance, leisure, consumption, time management, etc.) - To manage personal emotions and self-esteem - To establish self-identity	- To support the pupil in understanding the basics of managing his or her personal finances and consumer choices (Social studies, Finnish curriculum) - Students think about the consequences of not controlling their feelings and desires, and make a habit to control their feelings correctly. (Ethics, Korean curriculum)

In the first stage, as shown in Table 4, a coding frame was established based on the core concepts and descriptions of 21st century competencies which were the results of the previous step of the curriculum analysis (R1). Each core concept became the main category while descriptions of each concept and examples were also added in the coding frame.

In the second stage, initial coding was performed to find possible issues regarding the coding process and to establish coding rules to minimize the problems. After working through the data a few times, several issues were detected.

Firstly, some of the statements from the Finnish curriculum are longer and contain more complex sentence structures compared with the Korean samples. To resolve the issue, multiple codes were allowed per each objective.

Secondly, some objectives did not apply to any of the nine categories and the number of these examples was too little to generate a new category. For this reason, along with the nine categories, one category named 'NON' was added to include those cases.

Thirdly, some of the objectives were more focusing on specific content rather than competencies which means more than just knowledge according to the literature review. This issue was more prominent in the Korean samples. For example, many objectives were presented with the Korean words meaning 'analyze', 'search', and 'explore' following statements of specific knowledge (e.g. basic elements of the map, means of transportation).

These statements may not apply to any of the competencies. On the other side, 'analyze', 'search', and 'explore' can be included in Knowledge and Information Management (KIM) since one of the descriptions is about 'to seek and process knowledge and information'. This made it hard to draw a clear line between statements that apply to KIM or not, which may have resulted in broadening the meaning of KIM and possibly in the loss of some more specific characterization of the concept.

Table 5

Example of the coding process

	Ethics (Finland)										
N	Objectives	SL	SM	WL	KIM	ICT	CT	C	CC	CO	NON
1	to guide the pupil to recognise and assess arguments and their justifications										
2	to promote the pupil's ability to perceive relationships between issues and to develop his or her thinking										

Table 6

Percentages of agreement between two sets of the coding process

	Total	SL	SM	WL	KIM	ICT	CT	C	CC	CO	NON
Total	285	13	18	2	136	11	5	20	35	41	4
In agreement	244	8	16	1	123	9	5	17	29	33	3
In disagreement	41	5	2	1	13	2	0	3	6	8	1
In agreement (%)	85.6	61.5	88.9	50	90.4	81.8	100	85	82.9	80.5	75
Final (after resolving disagreements)	270	10	18	2	135	9	5	19	32	37	3

SL=Self- regulated Learning, SM= Self-Management, WL=Working Life, KIM= Knowledge and Information Management, ICT= ICT competence, CT= Creative Thinking, C= Cultural Competence, CC= Communication and Collaboration, CO= Community, NON=Not applicable

In the third stage, the data was coded based on the coding frame and coding rules constructed in the previous stages. The whole coding process was conducted twice with an interval of four weeks in between by the same researcher to be able to check intra-rater reliability and review

the disagreements to improve the validity of the classifications. The decision to use intra-rater rather than inter-rater coding was made because it would have been hard to find a second-rater that possessed all qualities needed for the coding process. The second coder would have needed comprehensive knowledge about 21st century competencies and proficient language skills in the English and the Korean language to be able to interpret and classify the objectives according to the coding scheme.

This resulted in two sets of coding results that were compared to check the reliability of the coding process (See Table 6). Earlier it was mentioned that the length of statements differed considerably between the two curricula and that it was therefore decided to allow multiple codes per statement. While this solved a problem that occurred during coding, it makes traditional methods to assess reliability be inapplicable. Agreement between ratings was used instead as an indication of reliability and disagreements were resolved afterward to improve validity. The justification for this approach is that the main aim was not to create a perfectly reliable coding scheme for the curricula, but one that was "good enough" to create an instrument for the questionnaire, and to get ideas about the curricula. The agreement rate is relatively high in SM, KIM, ICT, CT, C, CC, and CO, but relatively low in SL. The agreement is also low in WL and NON, but these categories are already so small in themselves that any disagreement would lower the percentage below 80%. Subsequently, 41 coding results in disagreement were revised and the final version of the results was made.

Table 7

Distribution of 21st century competencies between the Korean and Finnish Curricula

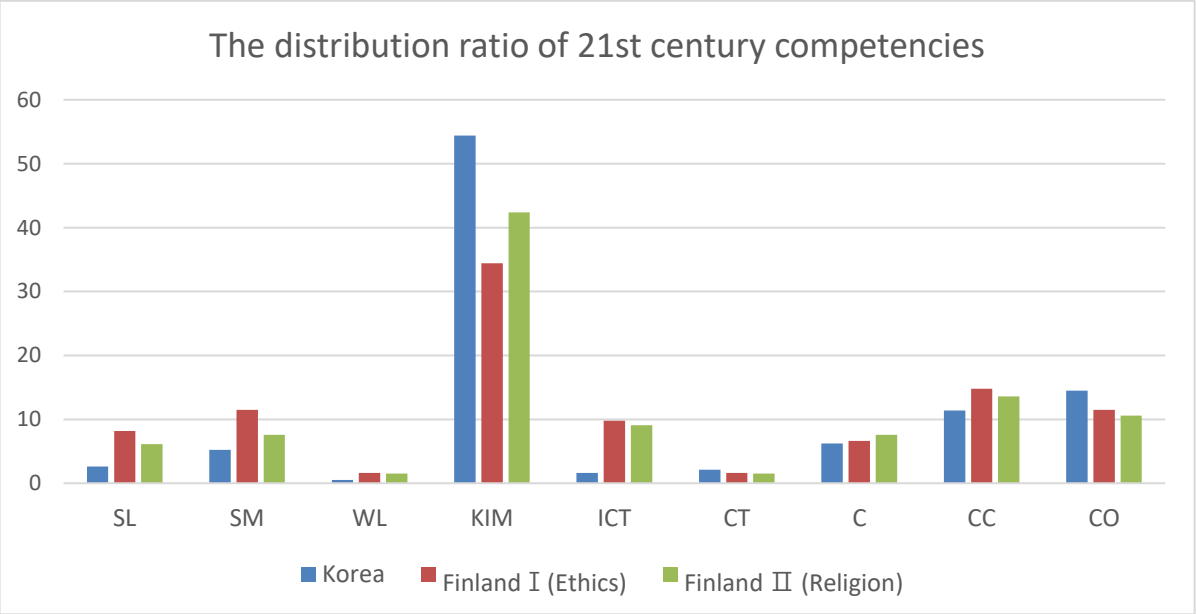
Country / N of objectives		Total	SL	SM	WL	KIM	ICT	CT	C	CC	CO	NON
Fi-I	M.T (15)	26	3	2	0	6	6	1	1	7	0	0
		%	11.5	7.7	0	23.1	23.1	3.8	3.8	26.9	0	0
	S.T (20)	24	1	2	1	13	0	0	1	1	5	0
		%	4.2	8.3	4.2	54.2	0	0	4.2	4.2	20.8	0
	Ethics (10)	11	1	3	0	2	0	0	2	1	2	0
		%	9.1	27.2	0	18.2	0	0	18.2	9.1	18.2	0
	Total (45)	61	5	7	1	21	6	1	4	9	7	0
		%	8.2	11.5	1.6	34.4	9.8	1.6	6.6	14.8	11.5	0
Fi-II	M.T (15)	26	3	2	0	6	6	1	1	7	0	0
		%	11.5	7.7	0	23.1	23.1	3.8	3.8	26.9	0	0
	S.T (20)	24	1	2	1	13	0	0	1	1	5	0
		%	4.2	8.3	4.2	54.2	0	0	4.2	4.2	20.8	0

	Religion (12)	16	0	1	0	9	0	0	3	1	2	0
		%	0	6.3	0	56.3	0	0	18.8	6.3	12.5	0
	Total (47)	66	4	5	1	28	6	1	5	9	7	0
		%	6.1	7.6	1.5	42.4	9.1	1.5	7.6	13.6	10.6	0
Kor	M.T (57)	63	4	2	0	33	1	4	1	16	0	2
		%	6.3	3.2	0	52.4	1.6	6.3	1.6	25.4	0	3.2
	S.T (72)	102	0	1	1	71	1	0	9	2	17	0
		%	0	1.0	1.0	69.6	1.0	0	8.8	2.0	16.7	0
	Ethics (24)	28	1	7	0	1	1	0	2	4	11	1
		%	3.6	25.0	0	3.6	3.6	0	7.1	14.3	39.3	3.6
	Total (153)	193	5	10	1	105	3	4	12	22	28	3
		%	2.6	5.2	0.5	54.4	1.6	2.1	6.2	11.4	14.5	1.6

M.T=Mother tongue, S.T=Social studies

Figure 2

The distribution ratio of 21st century competencies between the Korean and Finnish Curricula



2.3. Results

As indicated in Table 7 and Figure 2, the results were quantified to show the reflection ratio of each category, and Chi-square was calculated to determine the significance of differences illustrated by the graph.

A chi-square test of independence shows that the distribution of 21st century competencies differs between the Korean curriculum and the Finnish curriculum (I) that includes ethics, $X2 (8, N = 251) = 20.5$, $p = .01$, but not between the Korean curriculum and the Finnish curriculum (II) that includes religion $X2 (8, N = 251) = 13.10$, $p = .11$. This difference indicates that although the differences between the ethics and religion are not vast, these differences do take the Finnish curriculum farther away from its Korean counterpart in terms of the distribution over the competencies

In both countries, Knowledge and Information Management (KIM) is by far the most frequently appearing competency (54.4% in Kor, 34.4% in Fi-I, and 42.4% in Fi-II). Also, Communication and Collaboration (CC), Community (CO), and Cultural competency (C) are similarly popular in both countries (CC: 11.4% in Kor, 14.8% in Fi-I, 13.6% in Fi-II, CO: 14.5% in Kor, 11.5% in Fi-I, 10.6% in Fi-II, C: 6.2% in Kor, 6.6% in Fi-I, 7.6% in Fi-II).

Although 'working life competence and entrepreneurship' is one of the seven transversal competence areas indicated in FNC 2014, Working Life (WL) is not explicitly presented in selected objectives in the Finnish curriculum. Likewise, Creative thinking (CT) does not explicitly appear in the Korean sample even though it is one of six core competencies in KNC, 2015.

Significant differences between the two countries were found in ICT competencies, Self-regulated Learning (SL), Self-Management (SM), and Knowledge and Information Management (KIM). The reflection ratio of ICT, SL, and SM is significantly higher in Finland, and KIM is reflected significantly more in the Korean curriculum. Also, a closer inspection of the distribution shows that the greater difference is between the Korean curriculum and the Finnish curriculum (I) particularly in the cases of those four competencies (i.e. SL, SM, KIM, ICT).

IV. TEACHERS' PERCEPTIONS

1. Method

1.1. Participants

127 elementary school teachers from South Korea and Finland participated in this study (69 from Jeju Province in South Korea, 58 from Southwest Finland). All 69 Korean teachers responded to the questionnaire by an online survey system (i.e. Webropol) while 51 Finnish teachers responded to the online survey and 7 Finnish teachers answered a paper version of the questionnaire. In the sample, 89.8% are women (88.4% of the Korean teachers, 91.4% of the Finnish teachers) and 81.9% are class teachers (87% of the Korean teachers, 75.9% of the Finnish teachers). And 67.7% are between the ages of 30 and 49 years (78.2% of the Korean teachers, 55.2% of the Finnish teachers). The majority of the teachers are teaching 5 to 10 different subjects (72.5% of the Korean teachers, 75.9% of the Finnish teachers) and are satisfied with their job (79.7% of the Korean teachers, 82.7% of the Finnish teachers).

Table 8

Background information of the participants

Item	Category	Percentage (%)	
		Korean teachers (N=69)	Finnish teachers (N=58)
Gender	Male	11.6	6.9
	Female	88.4	91.4
	Other	0	1.7
Age	Under 30 years	14.5	8.6
	30-39	44.9	25.9
	40-49	33.3	29.3
	50-59	7.2	32.8
	Over 59	0	3.4
Are you a class teacher this year?	Class teacher	87.0	75.9
	Non-class teacher	13.0	24.1
How many different subjects are you teaching?	Under 5	26.1	20.7
	5-10	72.5	75.9
	Over 10	0	3.4
	Missing	1.4	0
Are you satisfied with your job?	Strongly dissatisfied	1.4	0
	Dissatisfied	1.4	5.2
	Neutral	17.4	12.1
	Satisfied	65.2	60.3
	Strongly satisfied	14.5	22.4

1.2. Instrumentation

1.2.1. Teachers' implementation of 21st century competencies scale

In the current study, the Teachers' implementation of 21st century competencies scale was developed based on the core concepts and the descriptions of 21st century competencies which were derived from the Korean and Finnish national core curricula (Chapter 3). Each description of the respective core concept became one of the items to measure teachers' perceptions regarding the implementation of 21st century competencies such as Self-regulated Learning (SL), Working Life (WL), and Cultural competencies (C). For example, one of the descriptions for Cultural competencies (C), "To be open to various cultural values" was modified to "In this class, I let students be open to various cultural values" to measure teachers' perceptions of implementing Cultural competencies in practices.

This process resulted in the initial version of the questionnaire with 36 items and nine scales. Also, the survey items were presented with a five-point Likert scale.

The detailed descriptions of the nine scales and sample items are as follows:

- Self- regulated Learning (SL, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to develop self-regulated learning competencies in class. For example, "I let students set goals, plan their work, assess their learning progress."

- Self-Management (SM, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to develop their self-management competencies such as being able to manage their physical wellbeing, their own daily life, and personal emotions. For example, "I let students manage their health, safety, well-being."

- Working Life (WL, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to develop competencies involved with working life and future career. For example, "I let students have an interest and a positive attitude towards work and working life."

- Knowledge and Information Management (KIM, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to develop skills to manage various types of knowledge and information reasonably and critically to make judgments or solve problems. For example, "I let students seek, evaluate, modify, and process knowledge and information."

- ICT competency (ICT, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to familiarize with various Information and Communications Technology (ICT) applications and develop their practical ICT competencies in producing their own work. For example, "I let students familiarize themselves with various ICT applications."

- Creative Thinking (CT, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to be open to new and diverse perspectives and create innovative ideas in class. For example, "I let students think outside of the box and be open to new and diverse perspectives."

- Cultural Competency (C, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to develop cultural competencies such as being able to understand cultural diversity and recognize the significance of culture and cultural heritage. For example, "I let students understand cultural diversity and respect others."

- Communication and Collaboration (CC, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to develop communication skills as well as collaboration competencies meaning abilities to interact and cooperate with others properly to strive for common goals. For example, "I let students express their opinions and feelings effectively in various situations."

- Community (CO, four items): This scale measures teachers' perceptions of the extent to which they facilitate and support students to recognize and participate in managing various issues in the community such as environment, equity, and human right. For example, "I let students understand the significance of rules, agreements, and trust in society."

These 36 items were translated to both Korean and Finnish languages and translated back to English to check the validity of the translation process. Further explanation regarding the process for the final version of the Teachers' implementation of 21st century competencies scale will be presented with the other two scales (1.2.4. The validation of the instrument for comparisons).

1.2.2. Teacher autonomy scale

To measure teachers' perceptions of teacher autonomy level, the Teacher autonomy scale verified by Pearson and Moomaw (2005) was used in the current study. Pearson and Moomaw validated the existing 2-factor structure of the Teaching autonomy originated from Pearson & Hall (1993) with confirmatory factor analysis.

Two factors constructing the Teacher autonomy scale were (a) *curriculum autonomy* containing six items measuring "selection of activities and materials, instructional planning and sequencing", and (b) *general teaching autonomy* having twelve items related to "classroom standards of conduct and personal on-the-job decision making" (Pearson and Moomaw, 2005, p. 47).

To keep the total length of the questionnaire within reasonable limits, it was decided not to use the full scale, but to use the results of the confirmatory factor analysis (Pearson & Moomaw, 2005) to select the items to measure the Korean and Finnish teachers' level of teacher autonomy. To be more specific, four items from curriculum autonomy and eight items from general teaching autonomy with the higher loading coefficients were chosen for the current study.

Exceptionally, "The materials I use in my class are chosen for the most part by me." was included even though the item had a relatively lower factor loading (.27) because of the consideration of selecting materials as important aspects of the curriculum autonomy. The item "In my situation, I have little say over the content and skills that are selected for teaching" was excluded for the study because it represents a reversed version of the item "The content and skills taught in my class are those I select" with a lower factor loading.

Furthermore, one of the items originally taken from general teaching autonomy, "I follow my own guidelines on instruction." was tentatively moved to curriculum autonomy. [1] This was because of the following reasons. First, Pearson and Moomaw illustrated an additional path from the item to curriculum autonomy with a factor loading of .32 which was similar to the loading for general teaching autonomy. Second, as mentioned by Pearson and Moomaw, "I follow my own guidelines on instruction" was logically more involved with curriculum autonomy. Third, by moving the item to curriculum autonomy, the number of items of the two dimensions would become more balanced with five and seven items rather than four and eight.

[1] Since the difference in reliability results of the two options (when included in curriculum autonomy: .832, when included in general teaching autonomy: .840) was small, the item was left in curriculum autonomy for the further analyses in the current study.

Table 9

The initial version of the Teacher autonomy scale and factor loadings from Pearson & Moomaw (2005)

Factors	Items (factor loading from Pearson & Moomaw, 2005)	Included in the current study
Curriculum autonomy (5 items)	What I teach in my class is determined for the most part by myself. (.80)	O
	The content and skills taught in my class are those I select. (.75)	O
	My teaching focuses on those goals and objectives I select myself. (.68)	O
	In my situation, I have little say over the content and skills that are selected for teaching. (.38)	X
	In my teaching, I use my own guidelines and procedures. (.30)	X
	The materials I use in my class are chosen for the most part by me. (.27)	O
	I follow my own guidelines on instruction. (.32)	O
General teaching autonomy (7 items)	The selection of student-learning activities in my class is under my control. (.43)	O
	I select the teaching methods and strategies I use with my students. (.38)	O
	My job does not allow for much discretion on my part. (.37)	O
	The scheduling of use of time in my classroom is under my control. (.36)	O
	I am free to be creative in my teaching approach. (.35)	O
	In my situation, I have only limited latitude in how major problems are solved. (.33)	O
	The evaluation and assessment activities used in my class are selected by others. (.33)	O
	I have little say over the scheduling of use of time in my classroom. (.31)	X
	I seldom use alternative procedures in my teaching. (.26)	X
	Standards of behavior in my classroom are set primarily by me. (.24)	X
	In my class, I have little control over how classroom space is used. (.23)	X

Original items from Pearson & Moomaw (2005) with factor loading coefficients and items included in the current study were indicated in Table 9.

The initial version of the Teacher autonomy scale with five items for curriculum autonomy and seven items for general teaching autonomy were reviewed again during the process of translating the items from English to Korean by the researcher.

Although the consistency and construct validity of items of the Teaching autonomy scale was verified by Pearson & Hall (1993) and Pearson & Moomaw (2005), the items should be examined carefully if they still would have the same level of consistency and validity when they were translated to the two different languages. In other words, the intended meaning of the original items can be easily changed by the process of translating to different languages.

For example, the original meaning of the items reflecting low autonomy such as “My job does not allow for much discretion on my part.” can subtly confuse the Korean teachers when those are translated in Korean. Therefore, to improve the validity and clarity of the items and to keep the same form of the sentence with the other nine items, three items presenting low autonomy were changed to sentences reflecting high autonomy.

For instance, “ My job does not allow for much discretion on my part.” was changed into “ My job allows for much discretion while teaching.”, “In my situation, I have only limited latitude in how major problems are solved.” to “ How major problems are solved in my classroom is under my control.”, and “ The evaluation and assessment activities used in my class are selected by others. ” was changed to “The evaluation and assessment activities used in my class are selected by myself.” Besides, “My teaching focuses on those goals and objectives I select myself.” was modified to “I choose the goals and objectives to focus on in my teaching.” to simplify the sentence for the process of translating.

The number of answer alternatives for the survey items was changed from a four-point Likert scale (Pearson & Hall, 1993) to a five-point Likert scale (e.g., 1 = definitely false, 3 = neutral, 5 = definitely true) in order to retain consistency with the formats of the other scales; Teachers’ implementation of 21st century competencies and Teacher self-efficacy scales were presented in a five-point Liker scale.

This modified version of the 12 items to investigate teachers’ perceptions of teacher autonomy was translated to both Korean and Finnish languages and translated back to English

to check the validity of the translation process. Further explanation concerning the process for the final version of the Teacher autonomy scale will be presented with the other two scales.

1.2.3. Teacher self-efficacy scale

As mentioned in (Pajares, 1996), teacher self-efficacy should be measured at the optimal level of specificity by representing critical elements and tasks related to what teachers deal with every day. (e.g. when it is too specific and it is only involved in tasks existing in one certain context, it may not proper to use for teachers in a different context; when it is too general it may not reflect efficacy).

The Ohio State Teacher Efficacy Scale (OSTES; Tschannen-Moran & Hoy,2001) that is used in this current study, was constructed based on Bandura's teacher efficacy scale (Bandura, n.d.) with that purpose in mind. Tschannen-Moran & Hoy reviewed the original items from Bandura's teacher efficacy scale, some of the items not capturing crucial teacher's tasks were excluded and some items reflecting aspects of teaching not represented in the original were added.

The resulting questionnaire adequately represents important tasks or elements related to teaching and teachers' work-life with the appropriate balance between specificity and generality for the current study. In other words, items constructing OSTES are specific enough to provide teachers with clear activities and tasks in mind when they assess self-efficacy on three aspects of efficacy; instructional strategies, classroom management, and student engagement. The elements addressed in the items are general enough to assess teachers in the two different contexts and compare the results.

Tschannen-Moran and Hoy (2001) designed two forms of the instrument to measure teacher self-efficacy: a long version with 24 items and a short version with 12 items. The short form with 12 items that also proved to be reasonably valid and reliable was used in the current study.

The initial version of the Teacher self-efficacy scale for the current study was examined during the process of translating the items from English to Korean by the researcher. Consequently, the phrase "to what extent" was removed in all 12 items since this phrase could

not be translated well into Korean. Also, the meaning of "to what extent" can be delivered to respondents with statements in the response scale such as "not at all (1)" and "some (3)"

The original nine-point Likert scale from Tschannen-Moran and Hoy (2001) was changed into a five-point Likert scale (e.g., 1 = not at all, 2 = very little, 3 = some, 4 = quite a bit, 5 = completely) in order to retain consistency with the other parts of the questionnaire.

- Efficacy for instructional strategies (four items) sample item: "Can you use a variety of assessment strategies?"
- Efficacy for classroom management (four items) sample item: "Can you control disruptive behavior in the classroom?"
- Efficacy for student engagement (four items) sample item: "Can you get students to believe they can do well in schoolwork?"

This modified version of the 12 items to investigate teacher self-efficacy was translated to both Korean and Finnish languages and translated back to English to check the validity of the translation process. Further explanation of the process for the final version of the Teacher self-efficacy scale will be presented with the other two scales.

1.2.4. The validation of the instrument for comparisons

Teachers' implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy scales were combined and named Teachers' implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy questionnaire (T21CAS). Back-translation and cognitive pre-testing were used to preserve the validity of the T21CAS questionnaire across the two contexts.

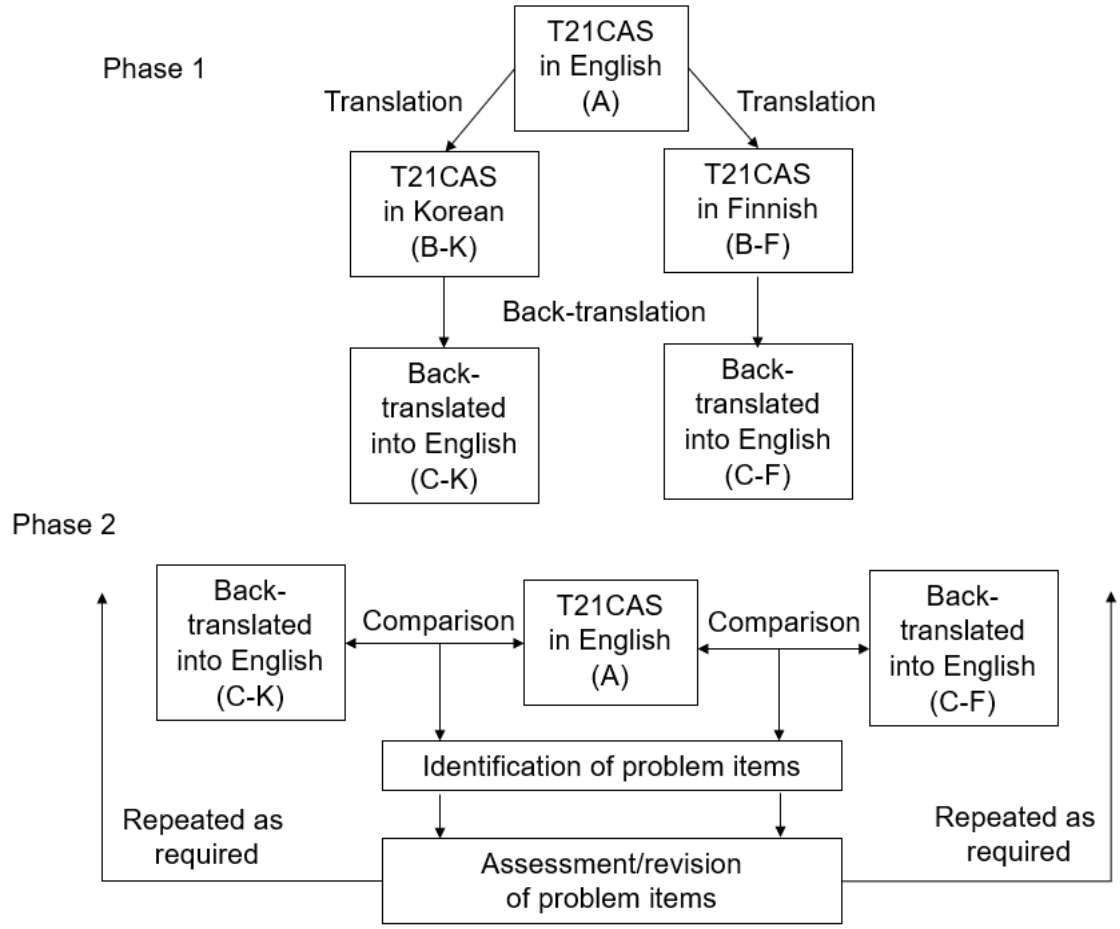
(1) Validation of the T21CAS: back-translation

As pointed by Sperber (2004), even though the translation has been commonly used for cross-cultural research, this method has a critical weakness that can cause poor validity of the research. To be more specific, the subtle meaning and intent of the original items can easily

shift through the process of the translation. Also, when the translator does not consider the particularity of the context, certain terms may not be understood by the respondents as expected.

Figure 3

Diagram of the translation (phase 1) and validation (phase 2) processes



Note. Modified from (Sperber, 2004, p.126)

In this regard, Sperber (2004) suggested one method consisting of the translation including the back-translation (phase 1) and validation processes (phase 2). The modified form of Sperber's method was used in the current study to validate the T21CAS questionnaire (see figure 3).

The first validation approach of the T21CAS questionnaire was conducted with the following steps. First, the original questionnaire presented in English (A) was translated to Korean (B-K) by the researcher and to Finnish (B-F) by one Finnish native speaker.

Second, another Korean native speaker and Finnish native speaker translated the Korean and Finnish versions of the questionnaire from the first step back to English.

Third, the original source-language version and the back-translated version were compared. In other words, both the back-translated version of the T21CAS into English from Korean (C-K) and the back-translated version of the T21CAS into English from Finnish (C-F) were compared with the original T21CAS (A) separately.

Each item in the two versions was evaluated by the researcher and another native English speaker if they contain the appropriate level of "similarity of interpretability to engender the same response even if the wording is not the same" (Sperber, 2004, p.126). The two raters evaluated the two sets of 60 items in the two versions independently and inserted 'O' when it had similar meaning while 'X' when the meanings of two versions of the item were dissimilar to the extent that it may cause different responses.

- ✓ Comparisons between the T21CAS back-translated into English from Korean (C-K) and the T21CAS in English (A)

Table 10

Comparisons between the T21CAS back-translated into English from Korean (C-K) and the T21CAS in English (A)

Rater A	Rater B	N	Sample items
O	O	56 items (93.3%)	(A) Can you use a variety of assessment strategies? (C-K) Can you use the various assessment strategies?
X	X	2 items (3.3 %)	(A) Can you craft good questions for your students? (C-K) Can you ask students questions that promote interaction among them?
X	O	2 items (3.3 %)	(A) I let students fuse knowledge, technology, and experience in various areas and use them to create new ideas. (C-K) I get students to converge knowledge, skills, and experience in various fields and utilize them to create new ideas.

Both raters agreed on 56 items (93.3%) as being translated properly while four items (6.6%) were identified by at least one of the raters as having possible translation issues. For example, in the third set of items presenting in Table 10, the word "technology" was incorrectly translated to "skills" since the Korean word 'Gisul' can mean both technology and skill.

- ✓ Comparisons between the T21CAS back-translated into English from Finnish (C-F) and the T21CAS in English (A)

Table 11

Comparisons between the T21CAS back-translated into English from Finnish (C-F) and the T21CAS in English (A)

Rater A	Rater B	N	Sample items
O	O	58 items (96.6 %)	(A) Can you calm a student who is disruptive or noisy? (C-F) Are you able to calm down a disruptive or loud student?
X	X	1 item (1.6 %)	(A) Can you get children to follow classroom rules? (C-F) Are your students able to follow the classroom rules?
X	O	1 item (1.6 %)	(A) I choose the goals and objectives to focus on in my teaching. (C-F) I set goals, which I focus on during my teaching.

Concerning the Finnish version, two raters agreed on 58 items (96.6%) as having the appropriate level of similarity of interpretability to engender the same response while two items (3.3%) were identified by at least one of the raters as having possible translation issues.

For instance, as presented in the second set of items (Table 11), "Can you get children to follow classroom rules?" is about teachers' capability while "Are your students able to follow the classroom rules?" is asking students' abilities to follow rules.

Lastly, items of both the Korean and Finnish versions of the T21CAS questionnaire were reviewed and revised based on the issues identified from the previous step. Furthermore, the process of reviewing and revising the items was repeated before finalizing the T21CAS questionnaire.

(2) Validation of the T21CAS: Cognitive pretesting of the T21CAS questionnaire

The second part of the validation concerning the T21CAS questionnaire was based on the cognitive processing of self-report items in educational research (Karabenick et al., 2007). Karabenick suggested the cognitive pretesting technique to examine whether respondents interpret the self-reported items as the researcher was intended to measure.

As pinpointed by Sperber (2004), when the questionnaire items are translated into another language for cross-cultural research, translated items can be irrelevant or confusing when applied to a different cultural group even though they were translated literally 'good'. In this context, Cognitive Pretesting (CP) was expected to show not only the respondents' cognitive processing of the survey items constructed with the researcher's intended meaning but also to reveal translation issues resulting from the particularity of the two different contexts that could not be caught in the previous back-translation process.

Thus, Cognitive Pretesting (CP) procedures and interview questions from Karabenick et al (2007) were modified and applied to the current study. The detailed descriptions of the modified CP process are as follows.

First, the T21CAS questionnaire was reviewed fully by the researcher to confirm the understanding of what each item intended to measure. Second, semistructured interviews were conducted with one Korean teacher and one Finnish teacher separately. Both teachers were primary level class teachers working in Jeju and Southwest Finland respectively which were the target areas of the current study. Face to face interview was performed for the Finnish teacher while an online video call software was used to interview the Korean teacher. The Finnish teacher was interviewed with the Finnish version of the T21CAS questionnaire and English was used for asking and answering the interview questions. One the other hand, the Korean teacher was interviewed with the Korean version of the T21CAS questionnaire also communicating with the Korean language.

Both teachers were asked to read 60 items one by one and three questions were asked for each item; (Question 1) What is this question trying to find out from you? (Question 2) Which answer would you choose as the right answer for you? (Question 3) Can you explain to me why you chose that answer? (Karabenick et al, 2007, p.143). Both interviews were recorded fully for the next step.

Third, items having possible issues with transferring the researcher's intended meaning to the target population were identified by evaluating interviewees' cognitive processing of each item. Accordingly, some of the items were reviewed and revised to have a valid instrument. To be more specific, the researcher examined the Finnish and Korean versions of the questionnaire independently and coded 'O' when the teachers interpreted the meaning as intended while 'X' when they processed differently than the researcher expected.

- ✓ Evaluation of the Korean version of the T21CAS questionnaire

Table 12

Evaluation of the Korean version of the T21CAS questionnaire

Code	Teacher autonomy scale (12 items)	Teacher self-efficacy scale (12 items)	Teachers' implementation of 21st century competencies scale (36 items)
O	12 items	11 items	31 items
X		1 item	5 items

One item from the Teacher self-efficacy scale and five items from the Teachers' implementation of 21st century competencies scale were identified to be understood by the Korean inconsistently with the intent (Table 12).

For example, the item translated into the Korean language of "Can you assist families in helping their children do well in school?" was understood by the Korean teacher as more related to the government education welfare policy rather than teachers' capabilities of supporting families to help their students for school work and life. This item was modified with words that can show the intended meaning more distinctly.

Besides, regarding the Teachers' implementation of 21st century competencies scale, the Korean teacher understood the item "I let students contribute to a sustainable future" as more regarding career development for the future rather than helping students to participate in the environmental issues. For this reason, 'a sustainable future' in the original item was changed into 'a sustainable development' which can show the original intent more easily.

- ✓ Evaluation of the Finnish version of the T21CAS questionnaire

Table 13

Evaluation of the Finnish version of the T21CAS questionnaire

Code	Teacher autonomy scale (12 items)	Teacher self-efficacy scale (12 items)	Teachers' implementation of 21st century competencies scale (36 items)
O	11 items	11 items	32 items
X	1 item	1 item	4 items

One item respectively from the Teacher autonomy scale and the Teacher self-efficacy scale, and four items from the Teachers' implementation of 21st century competencies scale were identified to be processed by the Finnish teacher not corresponding to the intent of the researcher (Table 13).

With those six items, issues resulting from the cultural particularity of the certain context were more recognized from the Finnish case. For instance, regarding the item "How major problems are solved in my classroom is under my control" from the Teacher autonomy scale, the Finnish teacher responded that;

"In Finnish school, it is about cooperation. Not just me. With consultants, psychologists, other specialties. I always get help."

This was distinctly different from the Korean teacher's interpretation of the item involved with the teacher's discretion on deciding the ways to solve the major problems in a class. Since this difference in interpretation cannot be not easily be resolved through a different formulation of the question it was decided to keep the question as is, but as something that may need extra attention in the analyses, and potentially in the interpretation of the outcomes.

Concerning one item "Are you able to create a classroom management system for every group of students?", the Finnish word 'hallintosysteemi' originally translated for 'classroom management' was not understood by the Finnish teacher who participated in the pre-testing interview. Instead of 'hallintosysteemi', she suggested 'työrauha' which was understood widely in the similar meaning of 'classroom management' in the Finnish context even though it translated to 'work peace' in English using the Google translator. Also, a different Finnish word 'luokanhallinta' was recommended by another Finnish native speaker commenting that 'työrauha' has a wider meaning than 'classroom management'. After another discussion with

the Finnish teacher (i.e. who participated in the pre-testing interview) about the issue, 'työrauha' was used for 'classroom management', also 'luokanhallinta' was added at the end of the sentence with a bracket to specify the meaning.

Regarding the Teachers' implementation of 21st century competencies scale, the four items coded as 'X' were from Self-regulated Learning (SL) and Self-Management (SM) scales (Table 13). For example, regarding the items of "I let students manage their health, safety, and well-being" and "I let students manage their own daily life (leisure, consumption, time management, finance, etc.)", the Finnish teacher respectively responded that;

"Do I control them? I don't think so. I will choose 3 because it is not just up to me."

"I am just a teacher. I might advise. I cannot control it. I can talk and we can discuss it. It is more family's business."

This interpretation did not correspond to the intended meaning which was involved with teachers' implementation to support students in managing their health, well-being, and daily life rather than students' actual achievement of those competencies. For this reason, the original eight items from Self-regulated Learning (SL) and Self-Management (SM) scales were revised using in the form of 'I support students in ~' instead of 'I let students ~'. For instance, "I let students manage their health, safety, and well-being" was changed into "I support students in managing their health, safety, and well-being."

Finally, after the repetitive process of reviewing and revising the items from the two validation methods, the final version of the T21CAS questionnaire was made and entered in the online survey creation program 'Webropol' to collect data from the Korean and Finnish teachers.

2. Data analysis

The SPSS program (IBM SPSS Statistics 25) was used to carry out the statistical analysis. The Cronbach's alpha coefficients were calculated to check the reliability of the T21CAS questionnaire. Independent-samples T-test was used to see whether there were statistically significant differences between the two countries in terms of perceived levels of teacher autonomy, teacher self-efficacy, and the implementation of 21st century competencies. Moreover, ANOVA analysis was conducted after splitting samples with three homogeneous

groupings identified by K-mean cluster analysis to provide more detail on differences across and within countries.

Pearson bi-variate correlation analysis was performed to specify the relationship between the variables. A standard level of $p < .05$ was used for evaluating the statistical significance of all quantitative analyses performed in this study. Following Cohen's (1988) work (as cited in Klerk & Koekemoer, 2015), effect sizes were used to determine the practical significance of the relationship setting at 0.30 (medium effect) and 0.50 (large effect) as the cut-off point of the correlation coefficients. Finally, multiple regression analyses using the Enter method and teacher autonomy, teacher self-efficacy as predictor variables were conducted to see if teachers' perceptions of autonomy and efficacy can predict the teachers' perceived level of implementation of 21st century competencies in the two countries.

Table 14

Reliability and T-test results

Variable	N of item	ALL			KOREA			FINLAND			T-test		
		MEAN	SD	α	MEAN	SD	α	MEAN	SD	α	t	df	Sig. (2-tailed)
Aut_Cur	5	3.78	0.77	0.83	3.98	0.08	0.87	3.55	0.65	0.76	3.32	124.91	**.001**
Aut_Gen	7	4.07	0.57	0.81	4.07	0.63	0.85	4.07	0.48	0.80	-0.08	123.89	.934
SL	4	4.01	0.68	0.83	3.90	0.79	0.86	4.15	0.50	0.76	-2.11	116.68	**.037**
SM	4	4.20	0.57	0.79	4.36	0.52	0.78	4.01	0.58	0.76	3.59	125	**.000**
WL	4	3.87	0.69	0.84	3.91	0.78	0.87	3.83	0.58	0.80	0.64	123.55	.523
KIM	4	3.97	0.77	0.92	3.84	0.86	0.93	4.11	0.62	0.89	-2.04	122.11	**.044**
ICT	4	4.14	0.69	0.87	4.04	0.75	0.87	4.25	0.61	0.86	-1.68	124.93	.096
CT	4	4.13	0.70	0.92	4.14	0.72	0.93	4.13	0.68	0.92	0.11	124	.911
C	4	4.51	0.46	0.80	4.54	0.48	0.86	4.46	0.43	0.70	1	125	.319
CC	4	4.60	0.41	0.76	4.67	0.41	0.83	4.53	0.39	0.65	1.91	125	.058
CO	4	4.34	0.59	0.83	4.37	0.63	0.86	4.29	0.54	0.78	0.77	124.92	.443
Eff_Ins	4	4.23	0.59	0.86	4.14	0.67	0.89	4.34	0.47	0.79	-2	121.04	**.047**
Eff_cla	4	4.18	0.59	0.88	4.29	0.65	0.88	4.04	0.48	0.87	2.43	123.23	**.017**
Eff_stu	4	3.81	0.68	0.84	3.97	0.78	0.87	3.62	0.5	0.76	3.04	117.14	**.003**

Aut_Cur=Curriculum autonomy, Aut_Gen=General teaching autonomy, SL=Self- regulated Learning, SM= Self-Management, WL=Working Life, KIM= Knowledge and Information Management, ICT= ICT competency, CT= Creative Thinking, C= Cultural Competency, CC= Communication and Collaboration, CO= Community, Eff_Ins= Efficacy for instructional strategies, Eff_cla= Efficacy for classroom management, Eff_stu= Efficacy for student engagement

3. Results

3.1. Reliability

As presented in Table 14, the Cronbach's alpha coefficients for the 14 scales (e.g. Aut_Cur, SL, and Eff_Ins) of the whole sample including the Korean and Finnish teachers ranged from .76 to .92, indicating good internal consistency for each scale. When the sample was separated by country, all reliability coefficients (α) were higher in the Korean sample (ranging from .78 to .93) than the Finnish sample (ranging from .65 to .92). Especially, coefficients (α) of Communication and Collaboration (CC) and Cultural competency (C) were a lot lower in the Finnish case (respectively .65 and .70) indicating that items of those two scales were answered less consistently by the Finnish teachers compared to the Korean teachers.

3.2. T-test

An independent-samples t-test was conducted to compare the perceived levels of teacher autonomy, teacher self-efficacy, and the implementation of 21st century competencies for the Korean and Finnish teachers (see Table 14).

There was a significant difference in the scores of curriculum autonomy for the Korean teachers (M = 3.98, SD = 0.08) and the Finnish teachers (M = 3.55, SD = 0.65; $t(125) = 3.32$, $p = .001$) indicating that the Korean teachers had higher levels of curriculum autonomy compared with the Finnish teachers.

When the T-test is conducted with five items of curriculum separated, items showing significant differences are Item 2 (Korea: M = 3.9, SD = 1.1, Finland: M = 3.4, SD = 1.02; $t(125) = 2.83$, $p = .005$), Item 3 (Korea: M = 4.4, SD = 0.73, Finland: M = 3.7, SD = 0.91; $t(108) = 4.3$, $p < .001$), and Item 4 (Korea: M = 4, SD = 0.96, Finland: M = 3.1, SD = 0.97; $t(121) = 5.34$, $p < .001$) which are about the choice of content, materials, and skills in teaching. This result indicates that the Korean teachers reported higher levels of autonomy in a selection of content, materials, and skills in class than the Finnish teachers.

Even though no significant difference was identified concerning general teaching autonomy as a whole demension, when the T-test is conducted with individual items of the scale, four items show significant differences between the two contexts. More specifically, the Finnish teachers reported significantly higher scores regarding Item 1 (Korea: M = 3.8, SD = 0.95, Finland: M = 4.5, SD = 0.57; $t(114) = -4.96$, $p < .001$) and Item 3 (Korea: M = 3.8, SD = 0.99,

Finland: M = 4.4, SD = 0.62; $t(116) = -4.03$, $p < .001$) while the Korean teachers reported higher levels of perception concerning Item 2 (Korea: M = 4.4, SD = 0.64, Finland: M = 3.9, SD = 0.66; $t(125) = 3.58$, $p < .001$) and Item 5 (Korea: M = 4.3, SD = 0.75, Finland: M = 3.8, SD = 0.79; $t(124) = 3.51$, $p = .001$). (General teaching autonomy Item 1: I am free to be creative in my teaching approach, Item 2: The selection of student-learning activities in my class is under my control, Item 3: My job allows for much discretion while teaching, Item 5: How major problems are solved in my classroom is under my control).

In terms of 21st century competencies, the Korean teachers (M = 4.36, SD = 0.52) had significantly higher levels of the implementation of SM than the Finnish teachers (M = 4.01, SD = 0.58; $t(125) = 3.59$, $p < .001$). Conversely, the Korean teachers (SL: M = 3.9, SD = 0.79, KIM: M = 3.84, SD = 0.86) had significantly lower levels of the implementation of SL and KIM than the Finnish teachers (SL: M = 4.15, SD = 0.50, KIM: M = 4.11, SD = 0.62); $t(117) = -2.11$, $p = .037$, $t(122) = -2.04$, $p = .044$).

Concerning teacher self-efficacy, there was a significant difference of efficacy for instructional strategies for the Finnish teachers (M = 4.34, SD = 0.47) and the Korean teachers (M = 4.14, SD = 0.67; $t(121) = -2$, $p = .047$) indicating that the Finnish teachers had higher levels of efficacy for instructional strategies compared with the Korean teachers. On the other hand, the Finnish teachers (Eff_cla: M = 4.04, SD = 0.48, Eff_stu: M = 3.62, SD = 0.5) had significantly lower levels of efficacy for classroom management and efficacy for student engagement than the Korean teachers (Eff_cla: M = 4.29, SD = 0.65), Eff_stu: M = 3.97, SD = 0.78); $t(123) = 2.43$, $p = .017$, $t(117) = 3.04$, $p = .003$).

Table 15

K-mean cluster analysis results

	Cluster 1 (H-H)		Cluster 2 (M-M)		Cluster 3 (L-L)	
Aut_Cur	4.6		3.6		3.2	
Aut_Gen	4.6		4.0		3.6	
Eff_Ins	4.6		4.4		3.7	
Eff_cla	4.7		4.2		3.7	
Eff_stu	4.3		3.9		3.2	
N of cases (%)	Korea	Finland	Korea	Finland	Korea	Finland
	32 (46.4%)	10 (17.2%)	16 (23.2%)	28 (48.3%)	21 (30.4%)	20 (34.5%)
	42		44		41	

Aut_Cur=Curriculum autonomy, Aut_Gen=General teaching autonomy, Eff_Ins= Efficacy for instructional strategies, Eff_cla= Efficacy for classroom management, Eff_stu= Efficacy for student engagement

3.3. Cluster analysis

K-mean cluster analysis led to three groups of teachers, which are significantly similar among each other while being different from other teachers. The first cluster comprises participants who reported a high level of both autonomy and self-efficacy which range from 4.3 to 4.7. The second cluster consists of teachers with a medium perception of the criterion which ranges from 3.6 to 4.4. The third cluster consists of those with a feeling of low autonomy and self-efficacy ranging from 3.2 to 3.7 (See Table 15).

A chi-square test of independence shows that there is a significant difference between Korea and Finland in terms of the distribution of teachers over the three clusters, X2 (2, N = 127) = 14.0, p = .001. This difference can mainly be attributed to a higher number of teachers in Cluster 1 and a lower number of teachers in Cluster 2 in Korea compared to Finland.

Table 16

One-way ANOVA analysis results

Competencies / Cluster		KOREA					FINLAND				
		M	SD	df	F	Sig.	M	SD	df	F	Sig.
SL	Cluster 1	4.37	0.59	2	19.6	**.000**	4.35	0.8	2	2.22	.119
	Cluster 2	3.83	0.55	/66			4.2	0.37	/55		
	Cluster 3	3.25	0.75				3.98	0.45			
SM	Cluster 1	4.65	0.35	2	15.83	**.000**	4.2	0.81	2	1.1	.341
	Cluster 2	4.28	0.47	/66			4.04	0.51	/55		
	Cluster 3	3.98	0.51				3.88	0.55			
WL	Cluster 1	4.23	0.74	2	8.93	**.000**	3.83	0.87	2	3.29	**.045**
	Cluster 2	3.92	0.81	/66			4.01	0.44	/55		
	Cluster 3	3.4	0.53				3.59	0.53			
KIM	Cluster 1	4.32	0.64	2	24.01	**.000**	4.08	1.24	2	1.14	.326
	Cluster 2	3.95	0.66	/66			4.23	0.39	/55		
	Cluster 3	3.04	0.7				3.96	0.39			
ICT	Cluster 1	4.41	0.6	2	13.47	**.000**	4.3	1.09	2	2.42	.098
	Cluster 2	4.06	0.58	/66			4.39	0.45	/55		
	Cluster 3	3.48	0.72				4.01	0.43			
CT	Cluster 1	4.5	0.65	2	15.45	**.000**	4.08	1.12	2	1.7	.193
	Cluster 2	4.19	0.54	/66			4.29	0.55	/54		
	Cluster 3	3.56	0.58				3.92	0.53			
C	Cluster 1	4.79	0.32	2	13.3	**.000**	4.83	0.37	2	4.97	**.010**

	Cluster 2	4.52	0.47	/66			4.41	0.47	/55		
	Cluster 3	4.19	0.49				4.35	0.32			
CC	Cluster 1	4.85	0.28	2	8.78	**.000**	4.68	0.46	2	3.77	**.029**
	Cluster 2	4.63	0.35	/66			4.61	0.36	/55		
	Cluster 3	4.42	0.5				4.35	0.33			
CO	Cluster 1	4.59	0.56	2	4.56	**.014**	4.33	0.83	2	0.24	.792
	Cluster 2	4.3	0.64	/66			4.33	0.43	/55		
	Cluster 3	4.1	0.63				4.23	0.54			

3.4. Analysis of variance

The one-way ANOVA (analysis of variance) was conducted to examine differences between the three clusters in terms of the implementation of 21st century competencies. And the results showed distinctly different pictures across the countries meaning that the clear pattern across clusters which was evident in all Korean competencies was not found in the Finnish case.

To be more specific, in the Korean sample, there were statistically significant differences at the $p < .01$ level in SL, SM, WL, KIM, ICT, CT, C and CC scores for the three groups: SL: $F(2, 66) = 19.6$, $p < .001$, SM: $F(2, 66) = 15.83$, $p < .001$, WL: $F(2, 66) = 8.93$, $p < .001$, KIM: $F(2, 66) = 24.01$, $p < .001$, ICT: $F(2, 66) = 13.47$, $p < .001$, CT: $F(2, 66) = 15.45$, $p < .001$, C: $F(2, 66) = 13.3$, $p < .001$, CC: $F(2, 66) = 8.78$, $p < .001$ (See Table 16). Post-Hoc comparisons indicated that all these outcomes were from the differences between Cluster 1 and Cluster 3. Additionally, in SL and SM, significant differences were found not only between Cluster 1 and Cluster 3 but also between Cluster 1 and Cluster 2 ($p = .02$). Also, one significant difference at the $p < .05$ level between Cluster 1 and Cluster 3 was found in CO scores; $F(2, 66) = 4.56$, $p = .012$.

One the other hand, in the Finnish sample, there was no statistically significant difference between the groups at the 0.05 level of significance except for WL ($F(2, 55) = 3.29$, $p = .045$), C ($F(2, 55) = 4.97$, $p = .010$), and CC ($F(2, 55) = 3.77$, $p = .029$). Post-Hoc tests indicated that for WL the only significant difference was between Cluster 2 and Cluster 3 ($p = .035$) while for C significant differences were found not only between Cluster 1 and Cluster 3 ($p = .011$) but also between Cluster 1 and Cluster 2 ($p = .021$). However, for CC none of the post-hoc comparisons was significant.

Furthermore, as shown in Table 16, the Korean teachers' significantly higher levels of the implementation of SM compared to the Finnish teachers, which was indicated in the t-test results, can be attributed mostly to the Korean teachers from cluster 1 (Mean of the cluster 1

is 4.65 in Korea, 4.2 in Finland). On the other hand, the Korean teachers' significantly lower levels of the implementation of SL and KIM than the Finnish teachers might be attributed mostly to the Korean teachers from cluster 3 ((Mean of the cluster 3) SL: 3.25 in Korea, 3.98 in Finland, KIM: 3.04 in Korea, 3.96 in Finland).

Table 17

Pearson's correlation coefficients (Korea)

	Aut_ Cur	Aut_ Gen	SL	SM	WL	KIM	ICT	CT	C	CC	CO	Eff_ Ins	Eff_ cla	Eff_ stu
Aut_Cur	1	.82**	.57**	.62**	.39**	.56**	.41**	.52**	.39**	.41**	.36**	.43**	.54**	.34**
Aut_Gen		1	.44**	.52**	.38**	.53**	.46**	.45**	.38**	.39**	.28*	.38**	.51**	.30*
SL			1	.70**	.62**	.76**	.59**	.65*	.48**	.53**	.50**	.66**	.63**	.74**
SM				1	.69**	.68*	.58**	.66**	.62**	.67**	.65**	.52**	.51**	.58**
WL					1	.63**	.65**	.65**	.54**	.45**	.54**	.51**	.43**	.54**
KIM						1	.72**	.75**	.60**	.55**	.64**	.67**	.57**	.61**
ICT							1	.56**	.54**	.43**	.50**	.60**	.47**	.46**
CT								1	.60**	.54**	.66**	.51**	.45**	.58**
C									1	.76**	.75**	.64**	.61**	.51**
CC										1	.74**	.50**	.45**	.50**
CO											1	.50**	.44**	.48**
Eff_Ins												1	.77**	.67**
Eff_cla													1	.68**
Eff_stu														1

* $p < .05$, **p < .01
* Correlation **is** practically significant $r > 0.30$ (medium effect); ** Correlation is practically significant $r > 0.50$ (large effect, shadow used to highlight)

Table 18

Pearson's correlation coefficients (Finland)

	Aut_ Cur	Aut_ Gen	SL	SM	WL	KIM	ICT	CT	C	CC	CO	Eff_ Ins	Eff_ cla	Eff_ stu
Aut_Cur	1	.70**	.06	.04	.004	-.03	-.06	-.01	.15	-.001	-.15	.12	.21	.30*
Aut_Gen		1	.24	.34**	.24	.16	.17	.21	.30*	.34**	.13	.39**	.47**	.48**
SL			1	.60**	.51**	.61**	.57**	.54**	.19	.34**	.63**	.38**	.31*	.36**
SM				1	.55**	.59**	.53**	.55**	.24	.42**	.55**	.33*	.17	.28*
WL					1	.67**	.50**	.61**	.15	.35**	.52**	.54**	.06	.33*
KIM						1	.66**	.82**	.12	.38**	.68**	.43**	.03	.32*
ICT							1	.67**	.14	.27*	.48**	.42**	.21	.34**
CT								1	.33*	.43**	.65**	.43**	.08	.28*
C									1	.52**	.32*	.17	.40**	.13
CC										1	.53**	.40**	.35**	.41**
CO											1	.33*	.23	.27*
Eff_Ins												1	.27*	.48**
Eff_cla													1	.63**
Eff_stu														1

* $p < .05$, **$p < .01$
* Correlation **is** practically significant $r > 0.30$ (medium effect); ** Correlation is practically significant $r > 0.50$ (large effect, shadow used to highlight)

3.5. Correlation analysis

Pearson's correlation coefficients were calculated to find statistical relationships among 14 variables which were; (a) curriculum autonomy and general teaching autonomy, (b) SL, SM, WL, KIM, ICT, CT, C, CC, CO, (c) Efficacy for instructional strategies, Efficacy for classroom management, and Efficacy for student engagement.

As shown in Table 17 and Table 18, curriculum autonomy was positively related to general teaching autonomy with a large effect in both countries (Korea: $r = .82$, $p < .01$, Finland: $r = .70$, $p < .01$). Also, efficacy for instructional strategies was positively related to the other two subscales of teacher self-efficacy. (more large effect sizes in the Korean sample). Almost every nine subscales regarding the implementation of 21st century competencies were correlated with each other with a large effect size in the Korean case while cultural competency (C) was not associated with other competencies except critical thinking (CT) in the Finnish case.

The distinctive difference was found between two countries concerning the relationship between teacher autonomy and teachers' implementation of 21st century competencies. Curriculum autonomy and general teaching autonomy were related to almost all of nine scales of competencies with a medium and large effect in the Korean sample while no significant correlation was found between curriculum autonomy and competencies, and only three correlations with medium effect were found between general teaching autonomy and competencies in the Finnish sample.

Similarly, the three sub-scales of teacher self-efficacy (i.e. Eff_Ins, Eff_cla, Eff_stu) were more strongly associated with the implementation of 21st century competencies in the Korean case compared with the Finnish case (see Table 17 and Table 18).

Regarding the relationship between teacher autonomy and teacher self-efficacy, all five scales were significantly related to each other in the Korean sample while no significant correlations were found between curriculum autonomy and the two sub-scale of teacher self-efficacy (i.e. Eff_Ins, Eff_cla).

Table 19

Summary of regression analysis for variables predicting teachers' implementation of 21st century competencies (Korea)

	KOREA									
Dependent Variable	Predictors	*B*	*SE B*	*β*	t	Sig.	F	R	R^2	$\triangle R^2$
Model 1 SL	(Constant)	-.029	.445		-.065	.948	27.461	.828[a]	.685	.661
	Aut_Cur	.424	.125	.429	3.400	.001**				
	Aut_Gen	-.150	.155	-.120	-.963	.339				
	Eff_Ins	.263	.136	.223	1.933	.058				
	Eff_Clas	-.094	.157	-.077	-.600	.551				
	Eff_Stu	.546	.104	.534	5.248	.000**				
Model 2 SM	(Constant)	2.030	.349		5.817	.000	14.915	.736[a]	.542	.506
	Aut_Cur	.303	.098	.472	3.097	.003**				
	Aut_Gen	.023	.122	.029	.190	.850				
	Eff_Ins	.119	.107	.156	1.120	.267				
	Eff_Clas	-.129	.123	-.161	-1.048	.299				
	Eff_Stu	.274	.082	.413	3.358	.001**				
Model 3 WL	(Constant)	.767	.611		1.256	.214	7.789	.618[a]	.382	.333
	Aut_Cur	.105	.171	.108	.610	.544				
	Aut_Gen	.205	.213	.167	.960	.341				
	Eff_Ins	.336	.187	.290	1.798	.077				
	Eff_Clas	-.263	.215	-.219	-1.224	.225				
	Eff_Stu	.411	.143	.411	2.881	.005**				
Model 4 KIM	(Constant)	-.727	.546		-1.333	.187	18.689	.773[a]	.597	.565
	Aut_Cur	.234	.153	.218	1.525	.132				
	Aut_Gen	.245	.191	.181	1.285	.203				
	Eff_Ins	.568	.167	.444	3.405	.001**				
	Eff_Clas	-.258	.192	-.194	-1.342	.184				
	Eff_Stu	.352	.128	.318	2.761	.008**				
Model 5 ICT	(Constant)	.455	.557		.816	.418	10.002	.665[a]	.443	.398
	Aut_Cur	-.072	.156	-.078	-.463	.645				
	Aut_Gen	.442	.195	.376	2.269	.027*				
	Eff_Ins	.605	.170	.545	3.551	.001**				
	Eff_Clas	-.226	.196	-.195	-1.151	.254				
	Eff_Stu	.136	.130	.142	1.047	.299				
Model 6 CT	(Constant)	1.019	.527		1.934	.058	11.005	.683[a]	.466	.424
	Aut_Cur	.293	.148	.326	1.984	.052				
	Aut_Gen	.068	.184	.060	.370	.713				
	Eff_Ins	.162	.161	.151	1.005	.319				
	Eff_Clas	-.140	.185	-.125	-.754	.454				
	Eff_Stu	.405	.123	.437	3.294	.002**				
Model 7 C	(Constant)	2.226	.359		6.208	.000	10.292	.671[a]	.450	.406
	Aut_Cur	.010	.101	.017	.104	.917				
	Aut_Gen	.070	.125	.093	.563	.576				
	Eff_Ins	.277	.110	.385	2.525	.014*				
	Eff_Clas	.149	.126	.200	1.184	.241				
	Eff_Stu	.051	.084	.082	.610	.544				
Model 8 CC	(Constant)	2.987	.334		8.938	.000	6.636	.587[a]	.345	.293
	Aut_Cur	.066	.094	.128	.701	.486				
	Aut_Gen	.092	.117	.141	.784	.436				
	Eff_Ins	.166	.102	.270	1.621	.110				
	Eff_Clas	-.062	.118	-.097	-.528	.599				
	Eff_Stu	.158	.078	.297	2.020	.048*				
Model 9 CO	(Constant)	2.173	.522		4.162	.000	5.744	.560[a]	.313	.259
	Aut_Cur	.176	.146	.224	1.200	.235				

	Aut_Gen	-.070	.182	-.070	-.384	.703				
	Eff_Ins	.289	.160	.308	1.808	.075				
	Eff_Clas	-.055	.184	-.057	-.300	.765				
	Eff_Stu	.208	.122	.257	1.708	.093				

unstandardized regression coefficient (B), standard error (SE B), standardized regression coefficient (β), adjusted R^2 (ΔR^2), * $p < .05$, ** $p < .01$

Table 20

Summary of regression analysis for variables predicting teachers' implementation of 21st century competencies (Finland)

	FINLAND									
Dependent Variable	Predictors	*B*	*SE B*	*β*	t	Sig.	F	R	R^2	$\triangle R^2$
Model 1 SL	(Constant)	1.805	.725		2.491	.016	2.656	.451[b]	.203	.127
	Aut_Cur	-.091	.137	-.119	-.667	.508				
	Aut_Gen	.097	.214	.093	.453	.652				
	Eff_Ins	.278	.158	.259	1.761	.084				
	Eff_Clas	.131	.177	.125	.739	.463				
	Eff_Stu	.148	.181	.146	.814	.420				
Model 2 SM	(Constant)	1.790	.820		2.184	.033	3.352	.494[b]	.244	.171
	Aut_Cur	-.352	.155	-.396	-2.271	.027*				
	Aut_Gen	.670	.242	.556	2.771	.008**				
	Eff_Ins	.187	.179	.150	1.044	.301				
	Eff_Clas	-.178	.200	-.146	-.889	.378				
	Eff_Stu	.178	.205	.152	.870	.388				
Model 3 WL	(Constant)	1.346	.749		1.797	.078	6.124	.609[b]	.371	.310
	Aut_Cur	-.265	.142	-.297	-1.869	.067				
	Aut_Gen	.359	.221	.297	1.625	.110				
	Eff_Ins	.535	.163	.429	3.278	.002**				
	Eff_Clas	-.363	.183	-.299	-1.990	.052				
	Eff_Stu	.306	.187	.260	1.632	.109				
Model 4 KIM	(Constant)	2.224	.846		2.630	.011	4.035	.529[b]	.280	.210
	Aut_Cur	-.242	.160	-.257	-1.512	.137				
	Aut_Gen	.240	.249	.189	.964	.339				
	Eff_Ins	.414	.184	.315	2.247	.029*				
	Eff_Clas	-.408	.206	-.318	-1.980	.053				
	Eff_Stu	.446	.212	.359	2.110	.040*				
Model 5 ICT	(Constant)	1.811	.862		2.102	.040	3.292	.490[b]	.240	.167
	Aut_Cur	-.265	.163	-.284	-1.626	.110				
	Aut_Gen	.194	.254	.153	.763	.449				
	Eff_Ins	.401	.188	.307	2.133	.038*				
	Eff_Clas	-.038	.210	-.030	-.180	.858				
	Eff_Stu	.275	.216	.223	1.277	.207				
Model 6 CT	(Constant)	1.701	.970		1.753	.086	3.090	.482[b]	.233	.157
	Aut_Cur	-.268	.186	-.250	-1.441	.156				
	Aut_Gen	.355	.285	.250	1.245	.219				
	Eff_Ins	.480	.211	.332	2.269	.028*				
	Eff_Clas	-.276	.238	-.196	-1.160	.252				
	Eff_Stu	.265	.245	.192	1.081	.285				
Model 7 C	(Constant)	2.550	.616		4.139	.000	3.082	.478[b]	.229	.154
	Aut_Cur	-.010	.117	-.016	-.089	.929				
	Aut_Gen	.172	.182	.192	.946	.349				
	Eff_Ins	.111	.134	.120	.828	.412				
	Eff_Clas	.438	.150	.484	2.914	.005**				
	Eff_Stu	-.277	.154	-.317	-1.800	.078				

Model 8 CC	(Constant)	2.552	.515		4.953	.000	4.889	.566[b]	.320	.254
	Aut_Cur	-.235	.098	-.398	-2.410	.020*				
	Aut_Gen	.330	.152	.414	2.175	.034*				
	Eff_Ins	.160	.112	.194	1.428	.159				
	Eff_Clas	.056	.126	.070	.447	.657				
	Eff_Stu	.150	.129	.192	1.161	.251				
Model 9 CO	(Constant)	2.434	.773		3.149	.003	2.984	.472[b]	.223	.148
	Aut_Cur	-.342	.146	-.413	-2.337	.023*				
	Aut_Gen	.266	.228	.237	1.165	.250				
	Eff_Ins	.273	.169	.236	1.621	.111				
	Eff_Clas	.072	.188	.063	.380	.706				
	Eff_Stu	.142	.193	.130	.733	.467				

unstandardized regression coefficient (B), standard error (SE B), standardized regression coefficient (β), adjusted R^2 (ΔR^2), * $p < .05$, ** $p < .01$

3.6. Regression analysis

Multiple regression analyses were performed to further investigate the relationships among the three variables (i.e. perceived level of teacher autonomy, teacher efficacy, and the implementation of 21st century competencies) under examination. The five variables entered as independent variables in the multiple linear regression analysis were: (a) perceived level of curriculum autonomy, (b) perceived level of general teaching autonomy, (c) perceived level of efficacy for instructional strategies, (d) perceived level of efficacy for classroom management, (e) perceived level of efficacy for student engagement. The nine sub-scales of the implementation of 21st century competencies such as SL and SM were separately entered as a dependent variable to see whether each competency could be predicted with those five independent variables. Consequently, nine significant regression models were respectively produced in both contexts. All nine models in the Korean context are significant at .01 level while in Finland, three models predicting WL, KIM, and CC are significant at $p < .01$ and the others are significant at $p < .05$ in Finland.

(1) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Self-regulated Learning (SL)

In Korea, entries of all five variables as independent variables to predict teachers' implementation of SL in the regression analysis produced a statistically significant model ($F(5, 63) = 27.46$; $p < .001$) accounting for 69% of the total variance. More specifically it seems that curriculum autonomy ($\beta = .429$, $t = 3.40$, $p < .01$) and efficacy for student engagement ($\beta = .534$, $t = 5.25$, $p < .01$) are significant predictors of the implementation of SL (see Table 19).

On the other hand, in Finland, one regression model (F (5, 52) = 2.66; p = .033) which explains only 20% of the total variance was found without any significant predictor of the dependent variable (see Table 20).

(2) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Self-Management (SM)

In Korea, after entry of all five variables as independent variables to predict teachers' implementation of SM, one significant model (F (5, 63) = 14.92; p < .001) was found, accounting for 54% of the total variance. It was shown that curriculum autonomy (β = .472, t = 3.1, p < .01) and efficacy for student engagement (β = .413, t = 3.36, p < .01) are significant predictors of the implementation of SM.

In Finland, one significant model (F (5, 52) = 3.35; p = .011) was found which explains 24% of the total variance. It appears that curriculum autonomy (β = -.396, t = -2.27, p < .05) and general teaching autonomy (β = .556, t = 2.77, p < .01) are significant predictors of the implementation of SM.

(3) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Woking Life (WL)

In Korea, after entering all five variables as independent variables to predict teachers' implementation of WL, one significant model (F (5, 63) = 7.79; p < .001) was found, accounting for 38% of the total variance. It seems that efficacy for student engagement (β = .411, t = 2.88, p < .01) is the only significant predictor of the implementation of WL.

In Finland, one regression model (F (5, 52) = 6.12; p < .001) which explains only 37% of the total variance was found. It was shown that efficacy for instructional strategies (β = .429, t = 3.28, p < .01) is the only significant predictor of the dependent variable.

(4) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Knowledge & Information Management (KIM)

In Korea, after entry of all five variables as independent variables to predict teachers' implementation of KIM, one significant model (F (5, 63) = 18.69; p < .001) was found, accounting for 60% of the total variance. It was shown that efficacy for instructional

strategies (β = .444, t = 3.41, p < .01) and efficacy for student engagement (β = .318, t = 2.76, p < .01) are significant predictors of the implementation of KIM.

In Finland, one significant model (F (5, 52) = 4.04; p = .004) was found which explains 28% of the total variance. It seems that efficacy for instructional strategies (β = .315, t = 2.25, p < .05) and efficacy for student engagement (β = .359, t = 2.11, p < .05) are significant predictors of the implementation of KIM.

(5) Teacher autonomy, teacher self-efficacy, and teachers' implementation of ICT competency

In Korea, after entering all five variables as independent variables to predict teachers' implementation of ICT, one significant model (F (5, 63) = 10; p < .001) was found, accounting for 44% of the total variance. It seems that general teaching autonomy (β = .376, t = 2.27, p < .05) and efficacy for instructional strategies (β = .545, t = 3.55, p < .01) are significant predictors of the implementation of ICT.

In Finland, one significant model (F (5, 52) = 3.29; p = .012) which explains only 24% of the total variance was found. It was shown that efficacy for instructional strategies (β = .307, t = 2.13, p < .05) is the only significant predictor of the dependent variable.

(6) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Creative Thinking (CT)

In Korea, entries of all five variables as independent variables to predict teachers' implementation of CT in the regression analysis produced a statistically significant model (F (5, 63) = 11; p < .001) accounting for 47% of the total variance. More specifically it seems that efficacy for student engagement (β = .437, t = 3.29, p < .01) is one significant predictor of teachers' implementation of CT.

In Finland, one regression model (F (5, 51) = 3.09; p = .016) which explains only 23% of the total variance was found. It was shown that efficacy for instructional strategies (β = .332, t = 2.27, p < .05) is the only significant predictor of the dependent variable.

(7) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Cultural competency (C)

In Korea, entries of all five variables as independent variables to predict teachers' implementation of Cultural competency produced a statistically significant model (F (5, 63) = 10.29; $p < .001$) accounting for 45% of the total variance. It was shown that efficacy for instructional strategies ($\beta = .385$, $t = 2.53$, $p < .05$) is the only significant predictor of the dependent variable.

In Finland, one regression model (F (5, 52) = 3.08; $p = .016$) which explains only 23% of the total variance was found. It seems that efficacy for classroom management ($\beta = .484$, $t = 2.91$, $p < .01$) is one significant predictor of the implementation of Cultural competency.

(8) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Communication & Collaboration (CC)

In Korea, after entering all five variables as independent variables to predict teachers' implementation of CC, one significant model (F (5, 63) = 6.64; $p < .001$) was found, accounting for 35% of the total variance. It seems that efficacy for student engagement ($\beta = .297$, $t = 2.02$, $p < .05$) is the only significant predictor of the implementation of CC.

In Finland, one significant model (F (5, 52) = 4.89; $p = .001$) which explains only 32% of the total variance was found. It appears that curriculum autonomy ($\beta = -.398$, $t = -2.41$, $p < .05$) and general teaching autonomy ($\beta = .414$, $t = 2.18$, $p < .05$) are significant predictors of the dependent variable.

(9) Teacher autonomy, teacher self-efficacy, and teachers' implementation of Community (CO)

In Korea, entries of all five variables as independent variables to predict teachers' implementation of CO produced a significant model (F (5, 63) = 5.74; $p < .001$) accounting for 31% of the total variance. It seems that there is no significant predictor of teachers' implementation of CO.

In Finland, one statistically significant model (F (5, 52) = 2.98; $p = .019$) which explains 22% of the total variance was found. And it was shown that curriculum autonomy ($\beta = -.413$, t = -2.34, $p < .05$) is the only significant predictor of the dependent variable.

V. DISCUSSION & CONCLUSION

1. Discussion of the Finding

Because of the emergence of 21st century competencies in recent decades, many countries including Korea and Finland incorporated the new concept in their curricula. This study aimed to examine how the 21st century competencies are reflected in the Korean and Finnish curricula, and teachers' perceptions of implementing these 21st century competencies in practice, both in general and in relation to two factors expected to affect teachers' implementation of 21st century competencies; teachers' perceived autonomy and self-efficacy.

1.1. Curriculum analysis and teachers' implementation of 21st century competencies

With the qualitative content analysis of the two national curricula (FNC 2014, KNC 2015), the nine core concepts of 21st century competencies were derived, which were Self-regulated Learning (SL), Self-Management (SM), Working Life (WL), Knowledge and Information Management (KIM), ICT competency (ICT), Creative Thinking (CT), Cultural competency (C), Communication and Collaboration (CC), and Community (CO). These were then used to analyze the two curricula.

The results of this analysis indicated that the distribution of 21st century competencies differs between the Korean curriculum and the Finnish curriculum that includes ethics. More specifically, SL, SM, and ICT appear more in the Finnish curriculum while KIM presents more in the Korean curriculum.

The nine core concepts of 21st century competencies were used as the basis for an instrument that aimed to assess the Korean and Finnish teachers' implementation of 21st century competencies in practice. The analysis of the teachers' answers revealed three significant differences.

Firstly, the level of the implementation of Self- regulated Learning (SL) is significantly higher in the Finnish context compared to the Korean context. This finding is congruent with the result from curriculum analysis which indicates that SL is reflected more in the Finnish

curriculum. This has a long history, learning to learn competencies and students' responsibilities for their learning have been emphasized in Finland since the 1990s, (Hautamäki & Kupiainen, 2014; Voogt & Kasurinen, 2005). In the current Finnish curriculum 'thinking and learning to learn' is one of the seven transversal competencies (Finnish National Core Curriculum for Basic Education, 2014).

However, Self-regulated Learning (SL) is a relatively new concept in Korea where competitiveness focusing on academic results has been emphasized more than students' development of learning to learn. This might explain the result of ANOVA analysis after splitting samples with three homogeneous groups showing that the Korean teachers' significantly lower levels of the implementation of SL might be attributed mostly to the Korean teachers from cluster 3 (i.e. teachers with a feeling of low autonomy and self-efficacy). Since the competencies regarding SL and learning to learn have not been established as much in Korea, it is harder for teachers to implement in practice especially for those who believe they do not have enough autonomy and efficacy in teaching.

Secondly, the level of the implementation of Self-Management (SM) is significantly higher in the Korean context. Even though SM is reflected less in the Korean curriculum compared to Finland, elements of Self-Management such as safety, health, and managing personal emotions have been highlighted in the Korean context. Especially, since the Sewol ferry disaster in 2014, which caused many casualties who were high school students going on to a school trip, safety has become one of the most important values in Korean society. Responding to the strong social needs, one class hour per week for 1st and 2nd grade in primary school was newly added to the original teaching hours for safety education (Korean Ministry of Education, 2015). It is possible that, in the Korean context, these social needs such as students' safety and health are well integrated with student guidance on a daily basis as well as teaching although they are not explicitly presented in selected objectives of the curriculum.

Another factor that may help to understand this inconsistency between curriculum analysis results and teachers' implementation of SM in practice might be related to different perceptions of student guidance and teachers' roles between the two countries. In a study that compared teachers' perceptions of school guidance in Korea and Finland, Kim (2016) found Korean teachers to be more actively involved, acting as parents in school rather than merely instructing students. Finnish teachers tended to consider themselves more as a bridge between

school, parents, and students. This perception is also clearly evident in the response from the Finnish teacher (pre-test interview for validating the T21CAS questionnaire; see Chapter 4) on the second item measuring the implementation of SM (i.e. 'I support students in managing their own daily life');

"I am just a teacher. I might advise. I cannot control it. I can talk and we can discuss it. It is more family's business."

This response was the reason for revising the items of SM and using the word 'support' instead of 'let' to emphasize the intended meaning. The different perceptions of Finnish and Korean teachers on SM indicate that this did not entirely prevent the influence of socio-cultural differences on the teachers' answers.

Thirdly, the level of the implementation of Knowledge and Information Management (KIM) is significantly higher in the Finnish context. This is also inconsistent with the curriculum analysis result which indicates KIM was reflected significantly more in the Korean curriculum. The explanation might be related to the coding issue already detected in the process of categorizing and coding each objective (see Chapter 3). As expected, including also objectives focusing on specific content rather than only on competencies resulted in higher rates of KIM in Korea since those objectives appear more in the Korean curriculum compared to the Finnish curriculum.

In addition to those three significant findings, some implications can be drawn from other competencies even though T-test results were not significant.

First, no significant difference was found concerning teachers' implementation of ICT while ICT appears significantly more in the Finnish curriculum. However, when the four items were separated, one significant difference can be identified from item 4 (i.e. 'I let students develop their practical ICT competence in producing their own work.') between Korea ($M=3.82$, $SD=1.03$) and Finland. ($M=4.21$, $SD=0.75$; $t(122)=-2.42$, $p<0.05$). This may suggest that ICT competencies in Finland also focus on creating with ICT not just using ICT. This may be because of the more beneficial situation for implementing ICT competencies in the Finnish context (in Turku, where the majority of the teachers in this study come from, each student has a personal iPad while in Jeju Province one set of tablets is usually shared by different classes).

Second, despite its mention as one of the seven transversal areas in Finland, Working Life is a relatively new concept for both countries. This may explain why the mean scores of WL (3.91 in Korea, 3.83 in Finland) are lower than other competencies, especially for the third and fourth items (i.e. 'I let students identify their vocational interests and develop skills for their future careers.', 'I let students be mindful of how the world and job market is changing.').

Third, based on the high mean scores, CT, C, CC, and CO are being implemented well in both counties which may indicate that those competencies are not new concepts and have been established in both countries. This is congruent with the curriculum analysis results showing that C, CC, and CO are similarly popular in both countries except for CT. In the case of CT, it is possible that Creative thinking has been well incorporated into teaching in Korea and Finland even though it is not explicitly presented in selected objectives of the curricula.

In summary, the nine 21st century competencies derived from the Finnish and Korean curricula were reflected differently in the objectives in the two curricula. Teachers' implementation of those competencies also shows variations possibly caused by different social needs, socio-cultural backgrounds, and educational resources in two contexts.

1.2. Teachers' perceptions of teacher autonomy

Based on the reliability results, the Teacher autonomy scale for the current study worked well with both contexts (curriculum autonomy: α =0.87 in Korea, α =0.76 in Finland; general teaching autonomy: α =0.85 in Korea, α =0.80 in Finland). However, the reliability coefficients (α) are higher in Korea indicating that the answers of Korean teachers to the survey items, especially curriculum autonomy items, were more coherent than those of the Finnish teachers.

Also, the T-test results indicate that Korean teachers have significantly higher levels of curriculum autonomy compared with the Finnish teachers. When the T-test is conducted with five items of curriculum autonomy separated, items showing significant differences are about the choice of content, materials, and skills in teaching. This result suggests that the Korean teachers reported higher levels of autonomy in the selection of content, materials, and skills than the Finnish teachers. These findings to some extent contrast with the expectation from the literature review indicating that Finnish teachers are granted a great degree of autonomy

(Sahlberg, 2011, Sahlberg, 2015) while Korean teachers tend to perceive curriculum autonomy as 'forced autonomy' meaning another form of regulation they have to comply with (Kim & So, 2014).

Additionally, even though no significant difference was identified concerning general teaching autonomy as a whole dimension, when the T-test is conducted with individual items of the scale, four items show significant differences between the two contexts. More specifically, the Finnish teachers reported significantly higher scores regarding Item 1 (I am free to be creative in my teaching approach) and Item 3 (My job allows for much discretion while teaching) while the Korean teachers reported higher levels of perception concerning Item 2 (The selection of student-learning activities in my class is under my control) and Item 5 (How major problems are solved in my classroom is under my control).

This is a clear indication that the Korean teachers and Finnish teachers perceive teacher autonomy differently. Thus, it is worthwhile to discuss different perceptions of the two groups and some possible reasons for these differences connecting the results from the survey, the pre-test interview, and the literature review.

1.2.1. How the Korean and Finnish teachers perceive curriculum autonomy in relation to the national curricula

The T-test results show that, in both countries, the mean scores of curriculum autonomy (3.98 in Korea, 3.55 in Finland) are lower than general teaching autonomy (4.07 in Korea and Finland) suggesting that the existence of national core curricula might affect teachers' perceptions of curriculum autonomy. This may be because, to some degree, both the Korean and Finnish teachers need to follow the guidelines from the national curricula.

However, how teachers perceive their curriculum autonomy concerning the national curricula might be different between the two countries. It is possible that even though teachers in two groups are following a similar amount of guidelines from the curricula, they reported differently because of different perceptions of the elements involving curriculum autonomy.

For instance, the Finnish teacher and Korean teacher's comments about curriculum autonomy items from pre-test interviews show the differences:

The Finnish teacher:

"Partly yes, because of the national curriculum. I feel that I have to follow it. But the way I am doing it may look like I am not following it, but I am." "I think I follow the curriculum pretty well. I choose how I do it."

The Korean teacher:

"I think this question is about the teachers' curriculum reconstruction. Within the guideline provided by the national curriculum, if I think it is an important topic, it can be dealt with more importantly, or if I think it is not, it can be taught less importantly. It is the teacher's choice." (translated from the Korean language to English by the researcher)

As seen in the comments, curriculum autonomy for the Finnish teacher is more about being carried out through their own teaching methods and strategies following content and skills presented in the curricula. On the other hand, while the Finnish teacher focuses more on teaching methods, the Korean teacher may perceive content, skills, and teaching strategies as a whole for curriculum reconstruction. In the Korean context, curriculum reconstruction refers to practices that teachers reinterpret and revise contents, teaching methods, and evaluation based on the national core curriculum to fulfill students' educational needs (Jang, 2019; Lee, 2019). Since the introduction of the new 2015 revised curriculum (KNC, 2015), the concept of teachers' curriculum reconstruction has been highlighted as an essential ability related to teacher professionalism (Lee, 2019). It is possible that items of curriculum autonomy were interpreted by the Korean teachers not only as levels of discretion in teaching but also as levels of their abilities or willingness to reconstruct the curriculum.

1.2.2. Which agents of teacher autonomy were considered by the Korean and Finnish teacher

According to Cribb & Gewirtz (2007), when autonomy is considered in the school context, three different agents exist which are individual agents (i.e. individual teachers), collective agents (i.e. teachers acting in teams), and institutional agents (i.e. central government agencies, and local authorities).

When the teachers interpret the items of the Teacher autonomy scale, the Finnish teachers maybe consider collective agents more than the Korean teachers. This speculation can be supported by the comments from the Finnish teacher regarding the item (Aut_Gen_5) "How

major problems are solved in my classroom is under my control" from the pre-test interview (also mentioned in Chapter 4).

"In Finnish school, it is about cooperation. Not just me. With consultants, psychologists, other specialties. I always get help."

Also, regarding the item (Aut_Cur_3) "The materials I use in my class are chosen for the most part by me.", she responded that;

"Materials, I cannot choose myself. Books and everything are chosen by teachers together."

On the other hand, the Korean teacher who participated in the pre-test interview perceived those items as individual teachers' discretion on choosing materials and deciding the ways to solve the major problems in the class.

Also, this speculation that the Finnish teachers consider collective agents more than the Korean teachers might explain the Finnish teachers' significantly lower mean scores on those two items (i.e. Aut_Gen_5 and Aut_Cur_3) compared to the Korean teachers.

1.2.3. Contextual factors affecting teachers' perception of teacher autonomy

The T-test results of teacher autonomy indicate that there are variations in terms of what teacher autonomy meant for teachers in two different countries, which are closely associated with the contexts where the teachers are located.

According to Hoyle and John's definition, which also stated in Chapter 2, a positive form of autonomy "entails a balance between personality, training, experience and the requirements of the specific educational context' (Hoyle and John, 1995:92). Also, Pearson and Hall defined teacher autonomy as teachers' perceptions of whether they control their work environment. Both definitions emphasize contextual factors and external influences affecting teachers' perception of teacher autonomy.

Teachers' different perceptions in terms of these influences between the two contexts may be shown in the pre-test interview. For example, regarding Item 3 ("My job allows for much discretion while teaching") and Item 5 ("How major problems are solved in my classroom is under my control"), the Finnish teacher and Korean teacher responded that:

The Finnish teacher:

"Yes, I think this is the Finnish teachers' right, giving a lot of freedom. In the Finnish system, there is no inspector system. No one knows what I teach." (Item 3)

"In Finnish school, it is about cooperation. Not just me. With consultants, psychologists, other specialties. I always get help. I will use other persons' specialty, skills, and knowledge. I definitely use help and I will talk to other people about what should I do. I might have an idea, but I still want to discuss it. Luckily, I don't have to decide on my own. I always get help. At least in this building, I will never be left alone." (Item 5)

The Korean teacher:

"I think they allow a lot of discretion. However, when teachers use that discretion in practice the government does not take any responsibilities for teachers. So, most teachers use 1 or 2 (out of 5) amount of discretion in practice." (Item 3) (translated from the Korean language to English by the researcher)

The Finnish teacher's responses are in line with the studies pointing out that teachers' collaboration and collective responsibilities along with teacher's autonomy have been encouraged and established well in the Finnish context (Sahlberg, 2007, Sahlberg, 2008, Sahlberg, 2011, Sahlberg, 2015; Webb et al., 2009).

On the other hand, even though teachers' autonomy in terms of their teaching is generally accepted in Korea, however, in reality, Korean teachers are more hesitant to carry out it because of other external circumstances such as the hierarchical structure of the education system, teacher evaluation system, and parents' expectations (Kim & So, 2014).

This speculation might explain inconsistent results between the T-test result of curriculum autonomy and Item 3 of general teaching autonomy indicating that the Korean teachers feel that they have less discretion in teaching even though they reported higher levels of autonomy in the selection of content, materials, and skills in class compared to the Finnish teachers.

1.3. Teachers' perceptions of teacher self-efficacy

The T-test result shows that the Finnish teachers reported significantly higher scores of efficacy for instructional strategies compared to the Korean teachers. This result implies that the Finnish teachers have higher levels of judgment that they are capable of instructional

strategies (e.g. crafting good questions for your students, using a variety of assessment strategies) than the Korean teachers.

On the other hand, the Finnish teachers reported significantly lower levels of efficacy for classroom management compared to the Korean teachers. This result might suggest that the Korean teachers have higher levels of belief that they are capable of classroom management (e.g. controlling disruptive behavior in the classroom, making children follow classroom rules) than the Finnish teachers. One possible explanation of this result is that there are differences regarding teachers' involvement in terms of student guidance between the two contexts. As mentioned earlier, teachers' active involvement to guide students to behave better has been emphasized in the Korean context while the Finnish teachers tend to consider student guidance from aspects of the study or career guide (Kim, 2016). These different perceptions might affect the T-test result of efficacy for classroom management.

Also, another significant difference was found indicating that the Korean teachers reported higher levels of efficacy for student engagement (e.g. motivating students who show low interest in schoolwork and assisting families in helping their children do well in school). This difference might result from teachers' different interpretations of the items originating from socio-cultural differences between the two countries. It is possible that when the Finnish teachers interpret those items, they perceive that motivating students and helping families are out of their control or they are students' or parents' responsibilities.

1.4. Relationships

1.4.1. How are teachers' perceptions of the implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy related?

To see if and how teachers' perceptions of the implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy are related to each other, correlation analyses were conducted.

Regarding the relationships between teacher autonomy and teacher self-efficacy, in the Korean context, all five subscales of teacher autonomy and self-efficacy are significantly and positively related to each other. This result supports the finding of the previous study that teacher self-efficacy and autonomy are positively associated (Skaalvik & Skaalvik, 2014). On

the other hand, in the Finnish context, while teachers' general teaching autonomy is significantly and positively associated with the three subscales of teacher-efficacy, no significant correlations were found between curriculum autonomy and teacher self-efficacy except one with efficacy for student engagement ($r = .30$, $p < .05$). This distinctively different result might be because of the Finnish teachers' different perceptions of curriculum autonomy regarding the national curriculum as suspected earlier.

Earlier research suggested that curriculum autonomy is positively related to educational reform initiatives (Melenyzer, 1990; Short, 1994), and teacher autonomy is important in curriculum implementation (Kennedy, 1992). And the Korean case is in line with those studies. The Korean teachers' perceived levels of curriculum autonomy and general teaching autonomy are significantly and positively associated with the implementation of all nine scales of the competencies.

However, in the Finnish context, no significant correlation was found between curriculum autonomy and competencies, and only three correlations with medium effect were found between general teaching autonomy and the competencies. This is another example showing that the concept of teacher autonomy can be interpreted very differently depending on the particular context. A further discussion of the reasons behind these differences falls outside the scope of this paper.

Concerning the relationships between teacher self-efficacy and teachers' implementation of 21st century competencies, in the Korean context, all three subscales of teacher self-efficacy are significantly and positively related to all nine subscales of teachers' implementation of the competencies with the effect ranging from $r = .43$ to $r = .74$. These results support the previous study that teachers with a high level of self-efficacy are more likely to be open to new ideas and willing to implement innovative methods to meet students' needs (Guskey, 1988; Stein & Wang, 1988).

Also, in the Finnish context, significant and positive relationships between teacher self-efficacy and the implementation of the competencies were found with more variations depending on the variables. For example, efficacy for instructional strategies and efficacy for student engagement are correlated with competencies except for Cultural competency. This might be related to the significantly lower reliability result of C in the Finnish context indicating that the answers of the Finnish teachers to items of Cultural competency were not as consistent as those of Korean teachers. Moreover, efficacy for classroom management is

significantly correlated with SL, C, and CC but not with the rest of the competencies. This might be because of Finnish teachers' different interpretations of the items of efficacy for classroom management. More specifically, controlling disruptive behavior and making children follow classroom rules may not be understood as well as one of the elements of teachers' capabilities in the Finnish context where students' own responsibilities are well emphasized.

To further investigate the differences between the two groups of teachers, K-mean cluster analysis and the one-way ANOVA were performed. K-mean cluster analysis led to three groups of teachers including participants who reported a high level of both autonomy and self-efficacy, teachers with a medium level of both, and those with a low level of the criterion. Afterward, the one-way ANOVA was conducted to examine differences between the three clusters in terms of the implementation of 21st century competencies. The results showed that, in the Korean context, teachers with high levels of teacher autonomy and teacher self-efficacy tend to have higher levels of the implementation of the competencies than teachers with lower levels of the criterion. However, these patterns, which were very evident with the Korean teachers, were much less clear in the Finnish context. These results suggest that, especially in the Korean context, teacher autonomy, teacher self-efficacy, and teachers' implementation of 21st century competencies go hand in hand, which is congruent with the correlation analysis results.

1.4.2. Can teachers' autonomy and teachers' self-efficacy be factors to predict teachers' perceptions of the implementation of 21st century competencies?

To investigate whether teachers' autonomy and self-efficacy can be factors to predict teachers' perceptions of the implementation of 21st century competencies, multiple regression analyses were performed and nine significant regression models were respectively produced in both contexts. The total variance of each model was explained more by the Korean models probably resulting from the stronger associations between the variables as showed in the correlation analyses. The five variables of teacher autonomy and teacher self-efficacy (i.e. curriculum autonomy, general teaching autonomy, efficacy for instructional strategies, efficacy for classroom management, efficacy for student engagement) were shown to predict the level of competencies with some variations depending on the competencies and the contexts.

Curriculum autonomy was found to be a significant predictor of the implementation of SL and SM in the Korean context and SM, CC, and CO in the Finnish context. It is interesting to note that teachers' curriculum autonomy significantly predicted low levels of the implementation of SM, CC, and CO in Finland contrasting with the Korean results indicating curriculum autonomy as a significant predictor of high levels of the implementation of SL and SM. These negative relationships only occur between curriculum autonomy and the three competencies (i.e. SM, CC, CO) in the Finnish context. As mentioned earlier in this chapter, it might be due to items of curriculum autonomy being interpreted differently by the Finnish teachers compared to the Korean teachers. However, without further data collection, the understanding of the reasons for these differences are limited in the current study.

Additionally, regression analyses indicate that general teaching autonomy is a significant predictor of the implementation of ICT in Korea, and SM and CC in Finland. These positive relationships suggest that the greater the teachers' perception of general teaching autonomy, the better they implement those competencies (i.e. ICT in Korea, SM and CC in Finland) in practice.

Teacher self-efficacy also significantly predict teachers' implementation of 21st century competencies. Out of three subscales of teacher self-efficacy, in the Korean context, efficacy for student engagement is the one most frequently presented as a significant predictor of the implementation of the competencies (SL, SM, WL, KIM, CT, CC in Korea, KIM in Finland). On the other hand, in the Finnish context, efficacy for instructional strategies appears the most as a significant predictor (WL, KIM, ICT, CT in Finland, KIM, ICT, C in Korea). These may imply socio-cultural differences concerning what makes teachers efficient and which values have been more highlighted between the two countries. More specifically, teachers in Korea tend to involve student's life at home as well as in school to motivate them to engage better for schoolwork while teachers in Finland value more professional relationships for instructing and guiding students in the school (Kim, 2016). Additionally, efficacy for classroom management only appears as a significant factor to predict the implementation of Cultural competency in the Finland context.

2. Limitations and Recommendations

Although the current research provided some valuable findings, at least three limitations of this study should be noted.

The first limitation is in relation to sampling. The participants of this study were conveniently sampled from primary school teachers from Jeju Province and Southwest Finland. Therefore, the degree to which the sample employed represents the population of interest (i.e. Primary school teachers in South Korea and Finland) should be judged cautiously. Also, originally the study intended to exclusively target class teachers (i.e. teachers who are responsible for a particular group of students and usually teach more than one subject) considering that the implementation of 21st century competencies would be more significant when the teacher teaches more than one subject. Because the sample sizes for non-class teachers were not large enough to include as a separate group, and differences between class teachers and non-class teachers were small, the non-class teachers were also included in the sample. Though not apparent on the individual variable level, this decision may influence the results of the correlational nature of the study.

Secondly, because of the language barrier, all of the sources to investigate the Finnish context were written or translated into English, including the Finnish national curriculum which was one main source of the curriculum analysis. One the other hand, since the researcher is Korean, the amount of information in terms of the Korean context is greater than that of the Finnish context. This might confuse the coding process with the curricula or cause bias in research.

Thirdly, despite different perceptions of the concepts (i.e. teacher autonomy, teacher self-efficacy, 21st century competencies) between Korean and Finnish teachers were evident in this research, it is limited to investigate and interpret the differences more deeply without further exploring how teachers make sense of the concepts. While the pre-test interviews for the validation of the survey provided some indications for the origins of these differences, responses from one Finnish teacher and one Korean teacher are not enough to draw firm conclusions about the origins of differences between the two contexts. They did, however, give directions for future research that uses interviews with more teachers and a broader range of sources for a particular context to gain more insight into the differences.

3. Implications and Conclusion

This study attempted to not only understand 21st century competencies reflected in the curricula of the two countries but also examine teachers' implementation of those in practice. Although the incorporation of 21st century competencies into education is a global trend derived from challenging demands in the new century, when those are put into practice, contextual influences such as social needs, values, socio-cultural backgrounds actively affect the process of implementation. Likewise, even though teachers' autonomy and self-efficacy are internal and individual beliefs, they cannot be separated from the external circumstances in a particular context where they develop. These teachers' beliefs and perceptions play a critical role in implementing educational changes (Borko, 2004; Butler & Schnellert, 2012; Cerit, 2013) and maybe the reason that those well-intended curriculum reforms are not necessarily put into practice.

These two layers of the investigations revealed some discrepancies between the countries regarding the representation of the competencies in the curricula and the teachers' perceptions of their actual implementation of the competencies in class.

Furthermore, there were also gaps between the Korean and Finnish teachers' perceptions of the implementation of 21st century competencies, teacher autonomy, and teacher self-efficacy. In other words, one of the clearest findings of the study was that the three main concepts (i.e. 21st century competencies, teacher autonomy, teacher efficacy) were interpreted very differently by the Korean and Finnish teachers. This complexity of the concepts was well illustrated in the results of this study with distinctive interpretations between the Korean and Finnish teachers.

Another key finding of the study was the differences between the relationships among teachers' implementation of 21st century competencies, teacher autonomy, and self-efficacy. Based on the results of the study, it appears that in Korea teachers' higher levels of belief regarding teacher autonomy and self-efficacy leads to a higher level of the implementation of 21st century competencies. Therefore, supporting teachers with lower perceived efficacy and autonomy might be a good approach to get innovative ideas such as 21st century competencies implemented in practice. In the Finnish context, this interconnectedness among teacher autonomy, teacher self-efficacy, and the implementation of 21st century competencies seems to be much less strong, This appears to suggest that supporting teachers with lower autonomy

and efficacy perceptions would not be as beneficial in the Finnish context. The fact that the lowest level of implementation reported in the Finnish context was for the relatively new WL competencies provides an indication that more dedicated support for new elements in the curriculum would be a more appropriate choice in the Finnish context. However, because of a variety of variations existing in terms of the three concepts, the results should be interpreted cautiously and comprehensively along with the particularity of the context.

Considering that the purpose of comparative research is beyond merely comparing statistical numbers of different contexts, the current study provides valuable insights into the field of education. When policies are more easily and frequently borrowed from other countries, it should not be expected that the implementation will work exactly the same as in the context where they came from. The dynamics between any new concepts and possible factors that might affect the situation and people (e.g. teachers, students, and parents) in a particular context should be carefully considered.

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Appendix: T21CAS questionnaire

Teachers' implementation of 21st century competencies scale

	N	Korean	English (Original)	Finnish
SL (Self-regulated Learning)	1	나는 학생들이 학습 목표를 설정하고 자신의 학습을 계획하며 학습 과정을 스스로 평가할 수 있도록 지원한다.	I support students in setting goals, planning their work, assessing their learning progress.	Tuen oppilaitteni mahdollisuuksia asettaa tavoitteita, suunnitella työnsä ja arvioida oppimisensa etenemistä.
	2	나는 학생들이 자신의 학습 방법을 인식하고 자신만의 학습 전략을 개발할 수 있도록 지원한다.	I support students in recognizing their personal way of learning and developing their learning strategies.	Tuen oppilaitteni mahdollisuuksia tunnistaa heidän henkilökohtaiset oppimistapansa ja kehittää omia oppimisstrategioitaan.
	3	나는 학생들이 학습에 대한 즐거움 및 동기와 자신감을 유지할 수 있도록 지원한다.	I support students in maintaining motivation, confidence, and joy of learning.	Tuen oppilaitteni mahdollisuuksia ylläpitää motivaatiota, luottamusta ja oppimisen iloa.
	4	나는 학생들이 학습을 평생 학습의 과정으로서 인식할 수 있도록 지원한다.	I support students to perceive learning as a lifelong process.	Tuen oppilaitteni mahdollisuuksia nähdä oppimisen elämän mittaisena prosessina.
SM (Self-Management)	5	나는 학생들이 자신의 건강, 안전, 웰빙을 관리할 수 있도록 지원한다.	I support students in managing their health, safety, and well-being.	Tuen oppilaitteni mahdollisuuksia hallita heidän terveyttään turvallisuutta ja hyvinvointiaan.
	6	나는 학생들이 자신의 일상 생활을 잘 관리할 수 있도록 지원한다. (여가, 소비, 시간 관리, 재정 등)	I support students in managing their own daily life (leisure, consumption, time management, finance, etc.).	Tuen oppilaitteni mahdollisuuksia hallita heidän elämäänsä (vapaa-aika, kulutus, ajanhallinta, raha).
	7	나는 학생들이 자신의 감정을 조절하고 자아 존중감을 키울 수 있도록 지원한다.	I support students in managing personal emotions and build self-esteem.	Tuen oppilaitteni mahdollisuuksia hallita omia henkilökohtaisia tunteita ja rakentaa itsetuntoa.
	8	나는 학생들이 자신의 자아 정체성을 확립할 수 있도록 지원한다.	I support students in establishing self-identity.	Tuen oppilaitteni mahdollisuuksia rakentaa oma identiteetti.

WL (Working Life)	9	나는 학생들이 직업과 직업세계(생활)에 대한 흥미와 긍정적인 태도를 가질 수 있게 한다.	I let students have an interest and a positive attitude towards work and working life.	Annan oppilaitteni kiinnostua ja asennoitua positiivisesti työhön ja työelämään.
	10	나는 학생들이 직업과 기업가 정신의 중요성을 이해하게 한다.	I let students understand the significance of work and entrepreneurship.	Annan oppilaitteni ymmärtää työn ja yrittäjyyden merkityksen.
	11	나는 학생들이 자신의 직업적 관심사를 파악하고 미래의 직업을 위한 기술(역량)을 개발할 수 있게 한다.	I let students identify their vocational interests and develop skills for their future careers.	Annan oppilaitteni tunnistaa heidän omat ammatilliset kiinnostuksen kohteet ja kehittää taitoja tulevaa uraa varten.
	12	나는 학생들이 세계와 직업 시장이 어떻게 변하고 있는지 생각하게 한다.	I let students be mindful of how the world and job market is changing.	Annan oppilaitteni olla tietoisia siitä, miten maailma ja työmarkkinat muuttuvat.
KIM (Knowledge and Information Management)	13	나는 학생들이 주제를 비판적으로 분석하게 한다.	I let students analyze topics critically.	Annan oppilaitteni analysoida aiheita kriittisesti.
	14	나는 학생들이 다양한 지식과 정보를 탐색, 평가, 수정, 처리하도록 한다.	I let students seek, evaluate, modify, and process knowledge and information.	Annan oppilaitteni etsiä, arvioida, muokata ja prosessoida tietoa.
	15	나는 학생들이 문제해결, 논증, 추론, 결론 도출을 위해 다양한 지식과 정보를 활용하게 한다.	I let students utilize knowledge and information for problem-solving, argumentation, reasoning, drawing of conclusions.	Annan oppilaitteni hyödyntää tietämystä ja informaatiota ongelmanratkaisuissa, argumentoinnissa, päättelyssä ja johtopäätösten tekemisessä.
	16	나는 학생들이 자신의 논증, 결론, 해결방안을 평가하게 한다.	I let students evaluate their argumentation, conclusions, and solutions.	Annan oppilaitteni arvioida heidän omia argumentteja, päätelmiä ja ratkaisuja.
ICT (ICT competency)	17	나는 학생들이 다양한 ICT(정보통신기술) 응용 프로그램(애플리케이션)에 익숙해지도록 한다.	I let students familiarize with various ICT applications.	Annan oppilaitteni tutustua erilaisiin tietotekniikkasovelluksiin.
	18	나는 학생들이 자신의 삶에서 ICT(정보통신기술)의	I let students understand the significance and potential risks of ICT in their life.	Annan oppilaitteni ymmärtää tietotekniikan merkityksen ja mahdolliset riskit.

		중요성과 잠재적 위험을 이해하도록 한다.		
	19	나는 학생들이 ICT(정보통신기술)를 책임감 있고 안전하게 사용할 수 있게 한다.	I let students use ICT responsibly and safely.	Annan oppilaitteni käyttää tietotekniikkaa vastuullisesti ja turvallisesti.
	20	나는 학생들이 자신만의 작품을 제작하기 위해 필요한 실용적인 ICT(정보통신기술) 역량을 개발할 수 있도록 한다.	I let students develop their practical ICT competence in producing their own work.	Annan oppilaitteni kehittää käytännön tietotekniikkaosaamistaan oman työn tuottamisessa.
CT (Creative Thinking)	21	나는 학생들이 틀에 박힌 생각에서 벗어나며 새롭고 다양한 관점에 열린 태도를 가질 수 있게 한다.	I let students think outside of the box and be open to new and diverse perspectives.	Annan oppilaitteni ajatella epäkonventionaalisesti ja olla avoin uusille ja monipuolisille näkökulmille.
	22	나는 학생들이 새롭고 독창적인 아이디어를 만들 수 있게 한다.	I let students create new and innovative ideas.	Annan oppilaitteni luoda uusia ja innovaattisia ideoita.
	23	나는 학생들이 자신의 아이디어를 개발하고 정교화 할 수 있도록 한다.	I let students elaborate and develop their ideas.	Annan oppilaitteni kehittää heidän ideoitaan.
	24	나는 학생들이 다양한 분야의 지식, 기술, 경험을 융합하여 새로운 아이디어를 창출하는 데 활용할 수 있게 한다.	I let students fuse knowledge, skills, and experience in various areas and use them to create new ideas.	Annan oppilaitteni yhdistää tietämystä, taitoja ja kokemusta useilla eri aihealueilla ja käyttää niitä uusien ideoiden luomiseen.
C (Cultural Competency)	25	나는 학생들이 자신의 사회적, 문화적, 언어적 뿌리를 이해하게 한다.	I let students understand their social, cultural and linguistic roots.	Annan oppilaitteni ymmärtää heidän sosiaalisen, kulttuurisen ja kielellisen taustansa.
	26	나는 학생들이 문화적 다양성을 이해하고 다른 사람들을 존중하도록 한다.	I let students understand cultural diversity and respect others.	Annan oppilaitteni ymmärtää kulttuurista monimuotoisuutta ja muiden kunnioittamista.
	27	나는 학생들이 다양한 문화적 가치에 대해	I let students be open to various cultural values.	Annan oppilaitteni olla avoimia erilaisille kulttuuriarvoille.

		개방적인 태도를 가지도록 한다.		
	28	나는 학생들이 예술, 문화, 문화유산의 중요성을 인식하게 한다.	I let students recognize the significance of art, culture and cultural heritage.	Annan oppilaitteni tunnistaa taiteen, kulttuurin ja kulttuuriperinnön merkityksen.
CC (Communication and Collaboration)	29	나는 학생들이 다른 사람의 의견을 이해하고 존중할 수 있도록 한다.	I let students understand and respect other's opinions.	Annan oppilaitteni ymmärtää ja kunnioittaa muiden mielipiteitä.
	30	나는 학생들이 다양한 상황에서 자신의 의견과 감정을 효과적으로 표현할 수 있게 한다.	I let students express their opinions and feelings effectively in various situations.	Annan oppilaitteni ilmaista mielipiteitään ja tunteitaan tehokkaasti erilaisissa tilanteissa.
	31	나는 학생들이 공통의 목표 달성을 위해 다른 사람들과 상호 작용하고 협력하게 한다.	I let students interact and cooperate with other people to strive for a common goal.	Annan oppilaitteni olla vuorovaikutuksessa ja tehdä yhteistyötä muiden ihmisten kanssa yhteisen tavoitteen saavuttamiseksi.
	32	나는 학생들이 협상과 갈등 조정 능력을 키우게 한다.	I let students develop negotiation and conflict resolution skills.	Annan oppilaitteni kehittää neuvottelu- ja konfliktin ratkaisutaitoja.
CO (Community)	33	나는 학생들이 사회와 글로벌 커뮤니티의 환경, 공정성, 정의, 인권 등 다양한 이슈를 인식하고 그것을 해결하는 데에 참여하도록 한다.	I let students recognize and participate in solving various issues in society and the global community (environment, equity, justice, human right, etc.).	Annan oppilaitteni tunnistaa ja osallistua ratkaisemaan erilaisia yhteiskunnallisia ja globaaleja ongelmia (ympäristö, tasa-arvoisuus, oikeus, ihmisoikeudet jne).
	34	나는 학생들이 권리와 자유를 책임감 있게 사용하는 민주사회의 적극적인 시민이 될 수 있도록 한다.	I let students learn to become active citizens who use their rights and freedom responsibly.	Annan oppilaitteni oppia tulemaan aktiivisiksi kansalaisiksi, jotka käyttävät oikeuksiaan ja vapauksiaan vastuullisesti.
	35	나는 학생들이 사회의 규칙, 합의, 신뢰의 중요성을 이해하게 한다.	I let students understand the significance of rules, agreements, and trust in society.	Annan oppilaitteni ymmärtää sääntöjen, sopimusten ja luottamuksen tärkeyden yhteiskunnassa.
	36	나는 학생들이 지속 가능한 발전에 기여할 수 있도록 한다.	I let students contribute to a sustainable development.	Annan oppilaiteni antaa panoksensa kestävään kehitykseen.

Teacher autonomy scale

	N	Korean	English (Original)	Finnish
Curriculum autonomy	1	내 수업에서 중점이 되는 수업 목표는 내가 선택한다.	I choose the goals and objectives to focus on in my teaching.	Valitsen tavoitteet joihin keskityn opetuksessani.
	2	수업 시간에 무엇을 가르칠 것인지는 대부분 내가 결정한다.	What I teach in my class is determined for the most part by myself.	Määritän suurimmaksi osaksi itse mitä opetan luokassani.
	3	수업에 활용할 자료들은 대부분 내가 선택한다.	The materials I use in my class are chosen for the most part by me.	Valitsen luokassani käytettävät materiaalit suurimmaksi osaksi itse.
	4	수업 시간에 가르칠 내용과 기술(역량)은 내가 선택한다.	The content and skills taught in my class are those I select.	Valitsen luokassani opetettavat asiat itse.
	5	나는 내가 만든 가이드라인에 따라 교육한다.	I follow my own guidelines on instruction.	Seuraan omia linjojani ohjeistuksessa.
General teaching autonomy	6	나는 수업에 창의적인 교수법을 자유롭게 적용할 수 있다.	I am free to be creative in my teaching approach.	Voin olla vapaasti luova opetustyylissäni.
	7	수업에서 학생들이 어떤 학습활동을 할 것인지는 내가 결정한다.	The selection of student-learning activities in my class is under my control.	Hallitsen opiskelijoiden oppimisaktiviteettien valikoimaa.
	8	교직은 나에게 수업에 관한 많은 재량권을 허락한다.	My job allows for much discretion while teaching.	Työni antaa minulle paljon harkintavaltaa opettaessani.
	9	나의 교실에서의 시간 배분을 내가 결정한다.	The scheduling of use of time in my classroom is under my control.	Luokkahuoneen ajankäytön suunnitteleminen on minun hallinnassani.
	10	교실에서 일어나는 주요한 문제에 대한 해결법은 내가 결정한다.	How major problems are solved in my classroom is under my control.	Minun hallinnassani on miten suuret ongelmat ratkaistaan luokkahuoneessani.
	11	수업에 활용되는 평가 방법 및 평가 활동들은 내가 결정한다.	The evaluation and assessment activities used in my class are selected by myself.	Valitsen luokassani käytettävät arviointitavat.
	12	수업에 활용할 수업방법과 전략들은 내가 결정한다.	I select the teaching methods and strategies I use with my students.	Valitsen käyttämäni opetusmetodit ja strategiat.

Teacher self-efficacy scale

	N	Korean	English (Original)	Finnish
Efficacy for instructional strategies	1	다양한 방법의 평가 전략을 사용할 수 있습니까?	Can you use a variety of assessment strategies?	Voitko käyttää erilaisia arviointistrategioita?
	2	학생들이 내용을 잘 이해하지 못할 때, 다른 방법으로 설명하거나 다른 예를 제시할 수 있습니까?	Can you provide an alternative explanation, or example when students are confused?	Pystytkö tarjoamaan vaihtoehtoisen selityksen tai esimerkin jos opiskelijat eivät ymmärrä ensimmäistä?
	3	학생들에게 좋은 발문을 할 수 있습니까?	Can you craft good questions for your students?	Pystytkö tekemään hyviä kysymyksiä oppilaillesi?
	4	수업에서 다양한 방법의 교수 전략을 적용할 수 있습니까?	Can you implement alternative strategies in your classroom?	Pystytkö toteuttamaan vaihtoehtoisia strategioita luokassasi?
Efficacy for classroom management	5	교실에서 수업을 방해하는 행동을 통제할 수 있습니까?	Can you control disruptive behavior in the classroom?	Pystytkö kontrolloimaan häiriökäyttäytymistä luokassasi?
	6	학생들이 학급에 필요한 규칙을 따르도록 지도할 수 있습니까?	Can you get children to follow classroom rules?	Voitko saada lapset seuraamaan luokan sääntöjä?
	7	수업에 비협조적이거나 시끄러운 학생을 차분하게 만들 수 있습니까?	Can you calm a student who is disruptive or noisy?	Pystytkö rauhoittamaan häiritsevän tai äänekkään oppilaan?
	8	학생들과 함께 교실운영시스템을 구축할 수 습니까?	Can you establish a classroom management system with each group of students?	Pystytkö luomaan työrauhan luokkaan jokaisen opiskelijaryhmän kanssa? (luokanhallinta)
Efficacy for student engagement	9	학생들이 스스로 학습을 잘할 수 있다는 자신감을 갖게 할 수 있습니까?	Can you get students to believe they can do well in schoolwork?	Saatko oppilaasi uskomaan että he pystyvät menestymään koulussa?
	10	학생들이 학습의 가치를 인식하도록 도울 수 있습니까?	Can you help your students value learning?	Pystytkö auttamaan oppilaitasi ymmärtämään oppimisen arvon?
	11	학습에 별로 흥미가 없는 학생들에게 동기를	Can you motivate students who show low interest in schoolwork?	Pystytkö motivoimaan oppilaitasi, jotka eivät ole motivoituneita koulussa?

		불러일으킬 수 있습니까?		
	12	학생들의 학교생활을 돕기 위해 가정과 연계하여 지도할 수 있습니까?	Can you assist families in helping their children do well in school?	Pystytkö avustamaan perheitä auttamaan heidän lapsiaan pärjäämään koulussa?