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## Analyses of Early Childhood Teachers' Concept Maps on Economic Education

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### **Abstract**

*The purpose of the study was to examine early childhood teachers' content knowledge of economic education. The subjects, 60 early childhood teachers, were asked to draw concept maps about early childhood economic education. Their concept maps were analyzed in terms of superordinate and subordinate concepts by contents and frequencies. The results were as follows. First, 248 superordinate concepts were shown, and they were categorized into nine representative terms: 'Scarcity and Choice,' 'Decision Making,' 'Monetary Value,' 'Production,' 'Consumption,' 'Distribution,' 'Restrain,' 'Reuse,' and 'Economic Education Activity.' Second, 1,440 subordinate concepts were shown, and 'coin,' 'bill,' 'saving,' 'bank,' and 'money' were frequently shown. Third, the mean numbers of subordinate concepts per superordinate concepts showed that early childhood teachers had more knowledge about 'Consumption,' 'Monetary Value,' and 'Economic Education Activity' than other superordinate concepts. The results showed the need for early childhood teachers to have more systematic and hierarchical pedagogical content knowledge on economic education.*

**Keywords:** Economic Education, Concept Map, Early Childhood Teachers

### **1. Introduction**

Industrialization of these days makes people confront diverse and complex economic problems in daily lives. It is difficult for us to solve those problems without proper knowledge and concepts in economics. Economic concepts begin to be formed in early years, so the subjects of economic education should include not only adults but also young children. Although young children's concepts on economics are relatively inaccurate and naïve, those concepts are important in that they establish bases of mature and accurate economic concepts after childhood [1]. In addition, young children as part of consumer agencies also affect consumer and economic lives in family. Therefore, many researchers suggest the needs for young children to have various experiences of and knowledge in economics [2][3].

In addition, due to the increase of double-income families in modern society, the age that young children go to preschools has been lowered these days. The role of early childhood education in terms of economic education, thus, has become more important. Previous research reported that early childhood economic education affected young children's development in their knowledge and concepts as consumers and producers [4]. Therefore, the curriculum in early childhood education today needs to include appropriate economic education, and teachers' role is considerably important because they decide and practice curriculum.

Early childhood economic education is defined as education that helps young children be interested in economic and social phenomena around them and support their development of decision making in reasonable and effective ways [4][5]. There are various suggestions on which contents might be included in early

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childhood economic education. According to the Ministry of Education, Science, and Technology[6], nine major concepts are highly suggested to be encompassed in early childhood economic education; 'Scarcity and Choice,' 'Decision Making,' 'Monetary Value,' 'Production,' 'Consumption,' 'Distribution,' 'Restrain,' 'Reuse,' and 'Economic Education Activity.' The following is a brief explanation on each of the concepts. First, 'Scarcity and Choice' mean to understand that people face problems of choices because goods and services are lack, and their needs are different from person to person. Second, 'Decision Making' is to make reasonable decisions about what are needed and purchased. Third, 'Monetary Value' refers to the amount of goods and services that can be bought in money as the basis of economic life. It also deals with basic understanding of money or how it is used. Fourth, 'Production' means to understand how a wide range of products are made, and we are all producers as well as consumers. Fifth, 'Consumption' means to understand and to practice consumers' responsibilities and rights through planned experiences of desirable consumption. Sixth, 'Distribution' is to experience and to understand the meaning and value of the dissemination as the goods or services are attributed to individual members of society. Seventh, 'Restrain' means to know the need for the planned consumption and saving money. Eighth, 'Reuse' refer to recycling of used materials and to use them again as products. Ninth, 'Economic Education Activity' means activities that students may experience to get various economic concepts.

It is desirable for young children to learn the concepts in economic education at preschools through play [4]. It is also important not to make young children acquire economic knowledge by memorization but to relate economic education with their daily lives [7]. Since early childhood teachers who plan and operate the curriculum are major factors, their knowledge in economic education is crucial [8]. Previous study showed that the more knowledge on economic education early childhood teachers had, the more desirable behaviors young children formed [9]. Although many early childhood teachers were aware of the need for economic education, they had little experience with and reported to have difficulties in practicing economic education activities due to lack of knowledge or teaching materials [4][10]. Therefore, this study focused on the importance of early childhood economic education in modern society and investigated teachers' knowledge of economic education which had a major influence on its practice.

As teachers' content knowledge has been emphasized, various methods were proposed to measure its content and structure. One of the methods relatively often used is the concept map proposed by Novak and Gowin [12-13]. The concept map represents individual's concepts of a certain topic in a visual and graphical form. This method is reported as a useful instrument to measure the content and structure of teachers' knowledge [14]. In order to make concept maps, a teacher first writes down the superordinate concepts (1<sup>st</sup> level) that are most general and comprehensive and then writes down subordinate concepts (2<sup>nd</sup> and less levels) related to each of superordinate ones sequentially. This allows to visualize the concepts and knowledge that teachers have on a particular topic. The researchers can investigate teachers' concepts and their levels by analyzing the contents and frequencies of superordinate and subordinate concepts shown in the visualized diagrams. Thus, the present study utilized the method of concept maps to investigate early childhood teachers' knowledge on economic education. We proposed the following research questions:

*Research question 1:* What are the contents and frequency of superordinate concepts presented in early childhood teachers' concept map of economic education?

*Research question 2:* What are the contents and frequency of subordinate concepts presented in early childhood teachers' concept map of economic education?

*Research question 3:* What are the number of subordinate concepts for superordinate concepts presented in early childhood teachers' concept map of economic education?

## **2. Method**

### **2.1 Participants and Procedure**

The participants of the study were 60 early childhood teachers working at four daycare centers and nine kindergartens that were located in the metropolitan area in South Korea. The convenient sampling method was used to select the participants. All the participants were females. Of the participants, 38.3% were aged between 20 and 25, 38.8% were between 26 and 30, 13.3% between 31 and 35, 3.3% between 36 and 40, and 6.7%

were between 41 and 49. In terms of teaching experiences in years, 56.7% had 1 to 3 years, 20.0% had 4 to 6 years, 16.7% had 1 year or less, 5.0% had 10 years or more, and 1.7% had 7 to 9 years. In level of education, 51.7% graduated from 2 to 3-year colleges and 48.3% 4-year universities.

A preliminary survey was conducted using five early childhood teachers in November 1<sup>st</sup> through 3<sup>rd</sup>, 2017 in order to check out the average time that it would take and the processes in general. The data collection was conducted at the preschools or kindergartens where the participants were working in November 10<sup>th</sup>, 2017 ~ February 20<sup>th</sup>, 2018. The participants were given the consistent structured instructions about how to draw concept maps with an example of a theme other than early childhood economic education, and then asked to draw their own concept maps on early childhood economic education. No restrictions were specified regarding the total number of concepts. There was no time limit, and the average time to draw concept map was about 60 minutes. Once the participants started drawing concept maps, they were asked to fulfill some questions on their background information. They were allowed to revise the contents of their concept maps before submitting them.

## **2.2 Instrument**

In order to investigate early childhood teachers' content knowledge on early childhood economic education, the method of concept map proposed by Novak and Gowin [11] was utilized. The participants' concept maps represented their content knowledge and cognitive structures. The level of knowledge is expressed hierarchically depending on concept map components including superordinate and subordinate concepts. The most general and comprehensive content knowledge are shown in superordinate concepts while specific and narrow-downed knowledge are arranged in the lower levels of subordinate concepts.

## **2.3 Data Analyses**

Early childhood teachers' content knowledge of economic education was investigated by analyzing the superordinate and subordinate concepts as proposed by Novak and Gowin [11] and introduced by Lee [15]. In South Korea, some studies in the area of early childhood education used this method of analyses including Ahn and Kim [12]. Specifically, first, superordinate concepts were all recorded and categorized. Representing concepts of each category were then derived in order to examine the contents of superordinate concepts. The frequency of each representing concept was calculated. Second, subordinate concepts presented in the concept maps were all recorded and their frequency was calculated. Subordinate concepts of higher frequency were presented. Third, the numbers of subordinate concepts that were connected to each of superordinate concept were counted. Then the mean and standardized deviation of the numbers were calculated for each of representative superordinate concepts.

# **3. Results and Discussion**

## **3.1. Contents and Frequencies of Superordinate Concepts**

Superordinate concepts are in the highest hierarchical level of the concept map. They reflect concepts regarded by childhood teachers as important in the context of early childhood economic education. In this study, it turned out that early childhood teachers used 248 superordinate concepts in total. As these concepts were categorized with the representing terms designated, nine representing terms were drawn: 'Scarcity and Choice,' 'Decision Making,' 'Monetary Value,' 'Production,' 'Consumption,' 'Distribution,' 'Restraining,' 'Reuse,' and 'Economic Education Activity.' (Table 1). As to the frequency(%) of each representing term, 'Monetary Value' was 57 (23.1%), 'Economic Education Activity' 38 (15.2%), 'Consumption' 33 (13.6%), 'Restraining' 33 (13.2%), 'Production' 22 (8.7%), 'Reuse' 20 (7.9%), 'Decision Making' 23 (9.5%), 'Scarcity and Choice' 11 (4.5%), and 'Distribution' 10 (4.1%) in order.

This result indicated that in child economic education, early childhood teachers recognized the importance of each factor in the following order: 'Monetary Value,' 'Economic Education Activity,' 'Consumption,' 'Restraining,' 'Production,' 'Reuse,' 'Decision Making,' 'Scarcity and Choice,' and 'Distribution,' in order. These nine representative terms of superordinate contents were also found to be consistent with the major contents that were proposed in Economy and Consumer Education Program for the Internalization of the Basic Curriculum in Kindergarten [6]. In addition, the most frequently used superordinate concept was 'Monetary Value' which encompassed various terms used in concept maps in this study such as money, pocket money,

use of money, concept of money, history of money, credit, and gap between the rich and the poor. This result supported the previous study done by Kim and Kim [3] in that early childhood teachers recognized the monetary value the best and utilized it most frequently in their curriculum planning and practices. On the other hand, the frequencies of 'Scarcity and Choice' and 'Distribution' appeared relatively low, indicating that early childhood teachers would be required to aware of those concepts and to use in economic education more.

**Table 1. Contents and Frequencies of Superordinate Concepts**

Superordinate Concepts	Representative Terms	n(%)	Rank
Scarcity, Choice, Comparison, Opportunity Cost,	Scarcity and Choice	11( 4.5)	8
Decision Making, Information, Experience, News, Way to Use, Place, Jobs	Decision Making	23( 9.5)	5
Monetary Value, Pocket Money, Use of Money, Concept of Money, History of Money, Credit, Gap between the Rich and the Poor	Monetary Value	57(23.1)	1
Production, Producer, Import, Resource	Production	22( 8.7)	6
Consumption, Consumer, Demand, Consuming Habit, Expenses	Consumption	34(13.6)	3
Distribution, Sharing, Mart, Market, Sales, Free Market	Distribution	10( 4.1)	9
Restrain, Save, Saving, Donation	Restrain	33(13.2)	4
Reuse, Recycling, Reduce of Garbage	Reuse	20( 7.9)	7
Group Activity, Role Play, Game, Home Education, Play, Song, Language Activity, Education, Field Trip, Art	Economic Education Activity	38(15.2)	2
Sum in total		248(100.0)	-

### 3.2. Contents and Frequencies of Subordinate Concepts

Subordinate concepts are relatively specific and connected to the lower levels in the concept map. It turned out that early childhood teachers used 1,440 subordinate concepts in the concept map of economic education for young children. The top 15 terms of subordinate concepts in order were as follows: 'coin,' 'bill,' 'saving,' 'bank,' 'money,' 'market play,' 'mart,' 'pocket money entry book,' 'recycling,' 'frugality,' 'kinds,' 'money saving box,' 'account,' 'making account,' and 'donation.' This result indicated that early childhood teachers had various subordinate concepts of economic education, and that they considered 'coin,' 'bill,' 'saving,' 'bank,' and 'money' as particularly important ones.

It was found that frequently used subordinate contents were consistent with some of superordinate contents. For instance, coin, bill, and money were parts of 'Monetary Value,' and 'market play,' 'mart,' 'pocket money entry book,' and 'kinds' were parts of 'Economic Education Activity.' In addition, 'saving,' 'frugality,' 'bank,' 'money saving box,' 'account,' and 'account making' were parts of 'Restrain.'

### 3.3. Number and Mean of Subordinate Concepts per Superordinate Concepts

We counted the number of subordinate concepts for each of superordinate concepts and then calculated the means and standardized deviations (Table 2). 'Consumption' ( $M = 6.79$ ;  $SD = 4.17$ ) showed the highest mean, followed by 'Monetary Value' ( $M = 6.72$ ;  $SD = 4.25$ ), 'Economic Education Activity' ( $M = 6.05$ ;  $SD = 4.35$ ), 'Production' ( $M = 5.84$ ;  $SD = 3.04$ ), 'Restrain' ( $M = 5.76$ ;  $SD = 3.30$ ), 'Reuse' ( $M = 5.72$ ;  $SD = 2.92$ ), 'Distribution' ( $M = 4.90$ ;  $SD = 3.73$ ), 'Decision Making' ( $M = 4.67$ ;  $SD = 2.17$ ), and 'Scarcity and Choice' ( $M = 3.82$ ;  $SD = 1.30$ ) in order. The results showed that early childhood teachers had more knowledge on

'Consumption,' 'Monetary Value,' and 'Economic Education Activity' than other superordinate concepts. Lee [8] reported that most part of economic education in preschools and kindergartens focused on consumption related activities, and our results supported it. However, some concepts of economic education proposed by Ministry of Education, Science, and Technology [6] such as 'Scarcity and Choice,' 'Distribution,' and 'Decision Making' showed low means, which revealed that early childhood teachers needed to have more knowledge on these concepts. Teachers' knowledge and expertise can be enhanced through education and training [16], so we suggest that programs for teacher education should include and deliver comprehensive concepts on economic education.

**Table 2. Number and Mean of Subordinate concepts**

Superordinate concepts (Number of subordinate concepts)	M(SD)	Superordinate concepts (Number of subordinate concepts)	M(SD)
1. Scarcity and Choice (11)	3.82(1.30)	6. Distribution (56)	4.90(3.73)
2. Decision Making (86)	4.67(2.17)	7. Restrain (192)	5.76(3.30)
3. Monetary Value (366)	6.72(4.25)	8. Reuse(105)	5.72(2.92)
4. Production (113)	5.84(3.04)	9. Economic Education	6.05(4.35)
5. Consumption (227)	6.79(4.17)	Activity (269)	
Sum in total (1,440)			

#### 4. Conclusion

The purpose of the present study was to investigate early childhood teachers' content knowledge of economic education for young children. In order to fulfill the objective of the study, the content and frequency of superordinate and subordinate concepts as well as the mean of subordinate concepts per superordinate concepts presented in concept maps were analyzed. Major findings of this study were as follows: First, as the frequency of superordinate concepts early childhood teachers used 248 superordinate concepts in total. As categorized into 9 representing concept, they were 'Monetary Value,' 'Economic Education Activity,' 'Consumption,' 'Restrain,' 'Production,' 'Reuse,' 'Decision Making,' 'Scarcity and Choice,' and 'Distribution' in order of frequency.' Second, early childhood teachers used 1,440 subordinate concepts in total. Among them, 15 concepts of higher frequency in order were as follows: 'coin,' 'bill,' 'saving,' 'bank,' 'money,' 'market play,' 'mart,' 'pocket money entry book,' 'recycling,' 'frugality,' 'kinds,' 'money saving box,' 'account,' 'making account,' and 'donation.' In summary, findings of this study show that early childhood teachers had a wealth of superordinate concepts and subordinate concepts of economic education, but there were differences in scopes among major concepts. Early childhood teachers demonstrated high level and wide scope in 'Monetary Value,' 'Economic Education Activity,' and 'Consumption,' but low level and narrow scope in 'Decision Making,' 'Scarcity and Choice,' and 'Distribution.'

The results of the present study imply the need for early childhood teachers to have more systematic and hierarchical knowledge in the content organization. Since early childhood teachers' content knowledge of economic education affects planning and execution of curriculum for early childhood education, findings of this study need to be reflected in planning teacher education programs. In rapidly changing society today, economic education for young children, who are part of economic agents, is essential. Therefore, early childhood teachers' systematic and hierarchically organized knowledge is required for desirable economic education. In addition, the results would be utilized in developing and implementing teacher training and education programs of economic education for young children.

There are some limitations in this study, and further research is required. Since the presented study used the convenience sampling method, there are concerns of lacking generalizability of the results. Another limitation involves the restriction of the participants' residence on the metropolitan area. Further studies in the future need to take factors such as representative national samples and multiple data sources into account. We suggest that future researchers focus on investigation of how early childhood teachers' content knowledge of

economic education actually affects their planning and implementing related activities in curriculum.

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