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Examining the Curriculum Literacy, Pedagogical Knowledge and Skill Levels of Preservice Teachers[1]

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Abstract

Curriculum literacy includes the concepts of curriculum and literacy in one concept. Pedagogical knowledge is a classroom management competence and skill related to teaching and learning process. The aim of this study was to examine preservice teachers' curriculum literacy levels and their pedagogical knowledge and skills. This research sample, a correlational model, consists of 213 preservice teachers studying at a state university in the Eastern Anatolia Region. The Curriculum Literacy Scale and Pedagogical Knowledge and Skills Scale were used to collect the research data. Mann-Whitney U test and Kruskal-Wallis test were used to analyze the data. It was understood that preservice teachers had positive opinions on curriculum literacy and pedagogical knowledge and skills scales. There was no significant difference between preservice teachers' curriculum literacy levels related to gender variable. However, a significant difference was found in the reading sub-dimension of curriculum literacy with reference to the grade variable. Although there was no statistically significant difference between the pedagogical knowledge and skills of preservice teachers in relation to the grade variable, a significant difference was observed in all sub-dimensions of the grade variable. As a result, it was also found that there was a moderate positive correlation between preservice teachers' curriculum literacy levels and their pedagogical knowledge and skills levels.

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Introduction

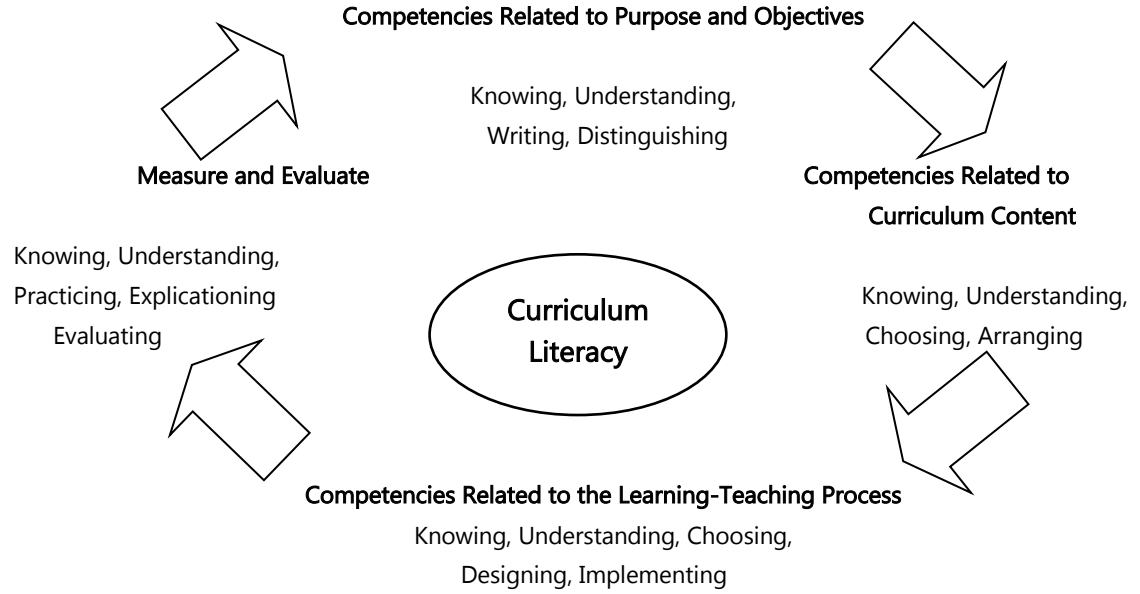
Today, competition between countries is increasing due to the effect of globalization and the more aware individuals. The essential requirement for the development and progress of the nations is education. The story of individuals and societies in economic, political, social, and legal fields is possible with education. In this direction, the most crucial investment of countries is their educational systems (Gencel, 2001). Rapid developments and changes in many fields led to new changes in the comprehension of learning and teaching (Arslan & Özpınar, 2008). Educators have remarkable responsibilities for countries to follow these changes to keep up with developed societies (Erdem, 2013). Teachers are the most important part of a country's education system. Teachers also have a significant role in providing people with knowledge and skills that societies need to raise new generations (Baysen et al., 2017; Çelikten et al., 2005).

Regardless of the stage of their life, people find the opportunity to get to know themselves and make sense of the society they live in, thanks to their education. The ability of individuals to discover their interests and skills, to know themselves, and to use their current potential for the society they live in, is related to the education they receive (Kozikoğlu & Uygun, 2018). For these reasons, teachers must be competent to fulfil their responsibilities in realizing the purpose of being an information society of nations (Erdem, 2013). The qualifications of the teachers and the qualifications of the students are closely related. The teacher is an artist and human architect who shapes the personalities of individuals (Çelikten et al., 2005). In this sense, teachers are expected to gain the knowledge and skills that students can acquire during the education-teaching process through the curriculum (Altıntaş et al., 2018). Teachers are the primary implementers of curriculum (Erden, 1998). All students can benefit from a curriculum aligned with their interests and needs with a teacher's guidance (Stabback, 2016). Practical implementation guidance and the success of the curriculum in practice will be achieved by effectively through using the knowledge and skills of the teachers and preservice teachers about the curriculum. In this regard, educators are expected that students will be able to interpret the curriculum, maintain the learning teaching process by the components of the applied curriculum, and use their literacy skills effectively (Karagülle et al., 2019). As a result, curriculum literacy is a skill that all teachers and preservice teachers should have (Erdem & Eğmir, 2018). Curriculum literacy is defined as interpreting and adapting the curriculum to the current conditions (Keskin & Korkmaz, 2021). Akyıldız (2020) explained curriculum literacy as the proficiency of curriculum knowledge, interpreting, designing, and evaluation skills. On the other hand, Mills and Unsworth (2015) explained curriculum literacy as symbols consisting of various practices that interact with the school's function and direction of activity. Literacy can be defined as teachers' awareness of the curriculum and ability to understand and implement the curriculum.

Curriculum literacy is a concept that comprises the "curriculum" and "literacy" concepts together. Curriculum literacy includes the skills related to the awareness of all activities in the meaning, implementation, and evaluation dimensions of the curriculum. The competence areas which a curriculum-literate teacher and preservice teachers is shown in Figure 1 (Akyıldız, 2020).

Figure 1

Competence Stages of Curriculum Literacy



An educator who is competent in the areas shown in Figure 1 can effectively complete the dimensions of designing and evaluating the curriculum (Akınoğlu & Doğan, 2012). Achieving the desired level of success from the curriculum depends on teachers' ability to interpret the content and structure of the curriculum (Karagülle et al., 2019). Therefore, teachers must plan the curriculum's objectives, content, educational situations, and evaluation dimensions (Ornstein & Hunkins, 1988/2016).

A teacher with curriculum literacy skills can make up-to-date and flexible planning by interpreting current conditions rather than applying a standard curriculum (Nsibande & Modiba, 2012). At the same time, being curriculum literate supports the development of preservice teachers' teaching skills and increases their level of readiness for the profession (Aygün, 2019). For this reason, preservice teachers should have curriculum literacy skills to fulfill the roles and responsibilities expected of them. Therefore, teacher training programs should be prepared in a way that supports the curriculum literacy skills of the preservice teachers (Bolat, 2017). Steiner (2018) states that curriculum literacy should be taken seriously by teacher training institutions. There are studies on curriculum and curriculum literacy in the literature (Akınoğlu & Doğan, 2012; Akyıldız, 2020; Aygün, 2019; Beck, 2013; Bolat, 2017; Erdem & Eğmir, 2018; Green, 1999; Kahramanoğlu, 2019; Karagülle et al., 2019; Karseth & Sivesind, 2018; Mills & Unsworth, 2015; Ornstein & Hunkins, 2016; Pinar et al., 1995; Shawer, 2010).

Today, there is a need for educators who have 21st-century skills that know the methods of accessing information and can use information by making use of technological opportunities. There is a need for a qualified workforce in the development of societies and in increasing the level of welfare. Therefore, teachers play an essential role in raising qualified individuals (Eskicumalı, 2005; Özer & Gelen, 2008). For teachers to fulfill this role, they need to have general culture, knowledge of the subject area, and the knowledge and skills of the teaching profession (Erden, 1998).

Pedagogical knowledge is a classroom management competence and skills related to education and training (Shulman, 1987). The knowledge model created by teachers in the process of scientific education in schools is designed as a combination of concepts, methods and the number of a model defined in the literature (Çiltaş & Akıllı, 2011). This was defined as pedagogical knowledge. One of the issues teachers constantly discuss is "how and how much the teacher should know his field." One of the most critical development in this field is the establishment of a national teaching commission by Lee Shulman and his friends in the United States in the 1980s, which is seen as an advance toward conceptualizing teacher knowledge (Öner, 2010). According to Shulman (1987), the categories that make up the teacher's expert knowledge are:

- Content knowledge: Knowledge of the structures that make up the field and the principles that organize it conceptually,
- Curriculum knowledge: Comprehending the materials and curriculum required for teaching,
- Pedagogical content knowledge: a mix of content and pedagogy that is only the teacher's expertise,
- General pedagogical knowledge: Beyond content knowledge, knowledge of general principles and strategies for classroom management and organization,
- Information about students and their characteristics,
- Knowledge of educational environments,
- It is the knowledge of educational values, goals, and desired results.

Teacher education has a great impact on raising the human profile of the current era, it also prepares students that can meet the needs of society, and adapt students to the community they live in. Therefore, teacher education should be emphasized to prepare preservice teachers for the profession (Gürşimşek, 1998; Özer & Gelen, 2008).

Shulman (1986, 1987), who mentioned the importance of the teacher's mastery of teaching methods and techniques, stated that to reach learning outcomes, teachers should first determine the content to be taught and the teaching purpose, make the content available to all students by using their pedagogical knowledge and skills and evaluate the learning-teaching process by making corrections. Afterward, it is necessary to complete the teaching process by eliminating the missing and faulty learnings. Within this context, pedagogical knowledge is a sum of skills that facilitate the understanding of information that students of different ages and education levels describe as easy or difficult (Shulman, 1986).

Shulman (1987) argues that for educators to convey a particular subject area in a way that students can understand, subject area knowledge and pedagogical knowledge skills of that subject area should be used together, and each educator can do this in different ways. The importance of preservice teachers and teachers having pedagogical content knowledge, which is a type of knowledge related to teaching the subject area, as well as leading professional knowledge and content knowledge, was emphasized by Shulman in 1986 for the first time. Shulman (1986) defined pedagogical content knowledge as ways to include analogies, pictures, drawings, examples, and explanations that can express the subject in teaching a subject, using the most valuable notations and organizing the subject content for a better understanding of the subject by the students. It refers to the mixture of pedagogical knowledge and content knowledge about how specific content is shown, conveyed, and applied to students with

different interests and abilities and how it is shared in the teaching process (Shulman, 1987). The essential components that Shulman (1986) advocated in pedagogical content knowledge are our knowledge of the elements representing the subject and understanding the students' learning difficulties. Teachers should know that these components are intertwined and flexible. The better the educators know their students with learning difficulties, the more notation they Use, and the more effectively they use their pedagogical content knowledge. Based on all these explanations, pedagogical content knowledge can be defined as the unique interpretation of teachers' subject area knowledge to facilitate the learning of all students with different characteristics (Van Driel et al., 1998).

Pedagogical knowledge means having a comprehensive understanding of learning and teaching methods. This information includes classroom management, student learning, lesson planning, assessment of students, and how students learn (Koehler & Mishra, 2005). Tamir (1988), on the other hand, discusses the types of knowledge teachers should have in three categories. These are pedagogical content knowledge, general pedagogical knowledge and subject area knowledge. Subject area knowledge is defined as having a command of the fundamental theories related to a particular discipline and being able to apply the skills required by the field. General pedagogical knowledge and pedagogical content knowledge consist of four dimensions: student, program, education, and evaluation. There are apparent differences between general pedagogical knowledge and subject area ability. This significant difference reveals the importance of teacher education because general pedagogical knowledge is handled by experts and facilitates the teaching of academic subjects.

On the other hand, subject-area knowledge should be acquired by people who are competent in pedagogy and who work with students in a specific subject area (Tamir, 1988). Pedagogical or field knowledge is not enough for teaching. More than knowledge of these two disciplines is required. Preservice teachers' ability consists mainly of specialized content and pedagogical knowledge. Therefore, preservice teachers should be given opportunities to gain special content knowledge and transform their basic discipline knowledge (Öner, 2010). In other words, teaching knowledge consists of a multidimensional structure consisting of general pedagogical knowledge, pedagogical knowledge and content knowledge (König et al., 2014).

In the literature, there is no research on curriculum literacy and pedagogical knowledge and skills together. This situation reveals the original aspect of the research. At the same time, it can be said that curriculum literacy and pedagogical knowledge and skills, which are stated to be interrelated, are also important in terms of revealing the current situation of preservice teachers. In addition, it is predicted that this research will raise awareness about the importance of curriculum literacy in preservice teachers who are curriculum implementers and will be a source of information for curriculum development experts. The research topic and findings will also contribute to researchers who will research similar topics. In this direction, this study aimed to examine preservice teachers' curriculum literacy and pedagogical knowledge and skill levels.

For this purpose, the problem statements of the research are as follows:

- What is the level of preservice teachers' curriculum literacy?
- Do preservice teachers' curriculum literacies differ in terms of gender variable?
- Do preservice teachers' curriculum literacies differ in terms of the grade variable?
- What is the level of pedagogical knowledge and skills of preservice teachers?

- Do preservice teachers' pedagogical knowledge and skills differ in terms of gender variable?
- Do preservice teachers' pedagogical knowledge and skills differ in terms of the grade variable?
- Is there a significant relationship between preservice teachers' curriculum literacy and pedagogical knowledge and skills?

Method

Research Model

This research is a correlational type. This model was used because the relationship between variables was examined. There are two types in the correlational model, correlation and comparison. Correlational research is conducted to examine the relationship between two or more variables and determine the degree of this relationship. Correlational research is an essential study that provide the necessary information to reveal the relationship between variables, determine the level of the relationship and carry out higher-level studies (Büyüköztürk et al., 2016).

Study Grup

The sample of the study consists of 213 preservice teachers studying at a state university. The criterion sampling method was used to determine the sample of the study. The criterion for using criterion sampling was determined as not being in the first year of university education. The reason is that preservice teachers who have just started university do not yet have knowledge of the program. The distribution of the sample related to the variables is given in Table 1.

Table 1

Distribution of the Sample Related to Various Variables

Variables		*n*	*%*
Gender	Female	170	79.81
	Male	43	20.19
Grade	2nd-grade	87	40.84
	3rd-grade	74	34.74
	4th-grade	52	24.42

When Table 1 is examined, 170 (79.81%) of the 213 preservice teachers are female, and 43 (20.19%) are male. In terms of the grade variable, 87 (40.84%) of the 213 preservice teachers are in the 2nd grade, 74 (34.74%) are in the 3rd grade, and 52 (24.42%) are in the 4th grade.

In the research, attention was paid to the fact that the sample consisted of preservice teachers studying in different departments and grade levels as much as possible. However, first-year preservice teachers were not included in the model because it is thought that teaching skills are acquired through institutional work and practical experience.

Data Collection Instruments

The data of the study were collected with 2 scales and a personal information form. Information about the data collection tools is given below.

Personal Information Form

The personal information form including gender, grade level and preservice teachers' department variables was used.

Curriculum Literacy Scale

Curriculum Literacy Scale was developed by Bolat (2017). The scale is prepared in 5-point Likert type and consists of 29 items and two subscales. The Cronbach Alpha internal consistency coefficient of the scale is 0.94. The scale explains 43.54% of the total variance. As a result of the confirmatory factor analysis, it was concluded that the calculated fit indices of the scale were adequate (X^2 =657.80; p < 0.05; sd = 376; NFI = 0.94; SRMR = 0.052; CFI = 0.97; NNFI = 0.97; IFI = 0.97; RMSEA = 0.059; GFI = 0.83 and AGFI = 0.80). The Cronbach Alpha reliability coefficient calculated for this research regarding the scale is .98.

Pedagogical Knowledge and Skills Scale

The scale was developed by Wong et al. (2012) and adapted into Turkish by Gökçek and Yılmaz (2019). The scale is prepared in 5-point Likert type and consists of 37 items and six sub-dimensions. The Cronbach Alpha internal consistency coefficient of the scale is 0.94. The six-dimensional structure of the scale was confirmed by confirmatory factor analysis (x2/sd=3.00, GFI=0.87, PGFI=0.75, PNFI=0.89, AGFI=0.85, IFI=0.98, RMSEA=0.05, NFI=0.97, and CFI=0.98). The Cronbach Alpha reliability coefficient calculated for this research regarding the scale is .97.

Analysis of Data

Ethical principles were followed during the research process. Ethics committee permission was obtained for the research. The data collection process took approximately 20 minutes. Before the data collection process, preservice teachers were asked whether they voluntarily participated in the study. In the data analysis, the normality of the data was examined first. For normality, median and arithmetic mean values, Kolmogorov-Smirnov and Shapiro-Wilk tests and graphs were examined and it was understood that the data were not normally distributed. Mann-Whitney U test and Kruskal-Wallis test, which are nonparametric tests were used in data analysis. Spearman's Rank Correlation Coefficient was used to determine the relationship between the two variables.

Results

Descriptive statistics regarding the mean scores of preservice teachers for the items of the curriculum literacy scale are given in Table 2.

Table 2

Opinions of Preservice Teachers on the Items of the Curriculum Literacy Scale

Sub-dimensions	$\overline{X}$	*Sd*
Reading	3.72	.96
Writing	3.68	.99
Total	3.70	.97

When Table 2 is examined, it is understood that preservice teachers generally express positive views on the items of the curriculum literacy scale.

Differentiation of preservice teachers' curriculum literacy related to gender variable was analyzed by Mann-Whitney U Test. Analysis Results are given in Table 3.

Table 3

Differentiation of Preservice Teachers' Curriculum Literacy Related to Gender Variables

Sub-dimensions	*Gender*	*N*	*Rank average*	*Rank sum*	*U*	*Z*	*p*
Reading	Female	170	107.04	18196.50	3648.50	-.018	.986
	Male	43	106.85	4594.50			
Writing	Female	170	105.13	17872.50	3337.50	-.880	.379
	Male	43	114.38	4918.50			
Total	Female	170	105.69	17968.00	3433.00	-.615	.539
	Male	43	112.16	4823.00			

When Table 3 is examined, no significant difference was found in both sub-dimensions and total curriculum literacy of preservice teachers according to gender variable [$U_{Reading}$=3648.50, z=-.018, p> .05; $U_{Writing}$=3337.50, z=-.880, p> .05; U_{Total}=3433, z=-.615, p> .05].

The Kruskal-Wallis Test was used to analyze whether preservice teachers' curriculum literacies differed according to the grade variable. The results are given in Table 4.

Table 4

Differentiation of Preservice Teachers' Curriculum Literacy Related to Grade Variable

Sub-dimensions	*Grade*	*N*	*Rank average*	*sd*	x^2	*p*	*Significant difference*
Reading	2	87	97.61	2	8.482	.014	4>2
	3	74	103.14				
	4	52	128.21				
Writing	2	87	98.26	2	3.898	.142	
	3	74	108.57				
	4	52	119.38				
Total	2	87	97.64	2	6.268	.044	4>2
	3	74	105.66				
	4	52	124.57				

When Table 4 is examined, a significant difference was found between the group rank averages of preservice teachers in the "Reading" sub-dimension and in total [$X^2_{Reading(2)}$ =8.482, p<.05; $X^2_{Total(2)}$ =6.268, p<.05] while there was no significant difference in the "Writing" sub-dimension [$X^2_{Writing\ (2)}$ =3.898, p>.05]. As a result of multiple comparison tests, it is understood that the differentiation of preservice teachers' curriculum literacies related to the grade variable

is in favor of 4th grade preservice teachers in the reading sub-dimension and in the current total between 4th grade preservice teachers and 2nd grade preservice teachers.

The mean scores and standard deviations of the preservice teachers on the items of the pedagogical knowledge and skills scale are given in Table 5.

Table 5

Opinions of Preservice Teachers on the Items of the Pedagogical Knowledge and Skills Scale

Sub-dimensions	$\overline{X}$	*Sd.*
Student learning	4.16	.95
Lesson planning	4.18	1.32
Instructional support	4.07	1.00
Accommodating diversity	4.18	.96
Classroom management	4.05	.97
Care and concern	4.07	1.01
Total	4.12	1.03

In general, it is understood that preservice teachers expressed their views on the items of the pedagogical knowledge and skills scale as "I agree" and "I totally agree."

The Mann-Whitney U Test was used to analyze whether preservice teachers' pedagogical knowledge and skills differed according to gender variable. The results are given in Table 6.

Table 6

Differentiation of Preservice Teachers' Pedagogical Knowledge and Skills Related to Gender Variables

Sub-dimensions	*Gender*	*N*	*Rank average*	*Rank sum*	*U*	*Z*	*p*
Student learning	Female	170	107.62	18295.50	3549.50	-.294	.769
	Male	43	104.55	4495.50			
Lesson planning	Female	170	108.46	18439.00	3406.00	-.693	.488
	Male	43	101.21	4352.00			
Instructional support	Female	170	107.82	18329.50	3515.50	-.389	.698
	Male	43	103.76	4461.50			
Accommodating diversity	Female	170	110.21	18735.50	3109.50	-1.523	.128
	Male	43	94.31	4055.50			
Classroom management	Female	170	108.20	18393.50	3451.50	-.571	.568
	Male	43	102.27	4397.50			

When Table 6 is examined, no significant difference was found in both sub-dimensions and total pedagogical knowledge and skills of preservice teachers related to gender variable [$U_{\text{Student Learning}}$ =3549.50, z=-.294, p> .05; $U_{\text{Lesson Planning}}$=3406, z=-.693, p> .05; $U_{\text{Instructional Support}}$ =3515.50, z=-.389, p> .05; $U_{\text{Accommodating Diversity}}$ =3109.50, z=-1.523, p> .05; $U_{\text{Classroom Management}}$ =3451.50, z=-.571, p> .05; $U_{\text{Care and Concern}}$=3457, z=-.550, p> .05; U_{Toplam}=3299, z=-.986, p>.05].

The Kruskal-Wallis Test was used to analyze whether the pedagogical knowledge and skills of preservice teachers differed according to the grade variable. The results are given in Table 7.

Table 7

Differentiation of Pedagogical Knowledge and Skills of Preservice Teachers by Grade Variable

Sub-dimensions	*Grade*	*N*	*Rank average*	*sd*	x^2	*p*	*Significant difference*
Student learning	2	87	93.10	2	12.329	.002	4>2
	3	74	106.60				
	4	52	130.83				
Lesson planning	2	87	90.47	2	14.659	.001	4>2
	3	74	109.26				
	4	52	131.43				
Instructional support	2	87	91.40	2	13.632	.001	4>2
	3	74	108.51				
	4	52	130.96				
Accommodation diversity	2	87	94.00	2	10.486	.005	4>2
	3	74	107.03				
	4	52	128.70				
Classroom management	2	87	89.32	2	15.731	.000	4>2
	3	74	110.95				
	4	52	130.95				
Care and concern	2	87	84.28	2	22.212	.000	3>2 4>2
	3	74	116.05				
	4	52	132.13				
Total	2	87	89.38	2	16.609	.000	4>2
	3	74	109.32				
	4	52	133.18				

When Table 7 is examined, a significant difference was found between the mean ranks of the groups in all sub-dimensions and total related to the grade variable of preservice teachers' pedagogical knowledge and skills [$X^2_{\text{Student Learning (2)}}$ =12.329, p<.05; $X^2_{\text{Planning Lesson(2)}}$ =14.659, p<.05; $X^2_{\text{Instructional Support(2)}}$ =13.632, p<.05; $X^2_{\text{Accommodation Diversity (2)}}$ = 10.486, p<.05; $X^2_{\text{Classroom Management (2)}}$ =15.731, p<.05; $X^2_{\text{Care and Concern(2)}}$ =22.212, p<.05; $X^2_{\text{Total(2)}}$ =16.609, p<.05]. As a result of the multiple comparison tests, it is understood that the pedagogical knowledge and skills of the preservice teachers differ related to the grade variable in favor of which groups. In addition, it is determined that there is a significant difference between the 3rd-grade preservice teachers and the 2nd-grade preservice teachers in favor of the 3rd-grade preservice teachers in the "Importance and Interest" sub-dimension.

Correlation analysis was conducted to determine the relationship between preservice teachers' curriculum literacy and their pedagogical knowledge and skills. The results are given in Table 8.

Table 8

The Relationship Between Preservice Teachers' Curriculum Literacy and Pedagogical Knowledge and Skills

		Curriculum Literacy	*Pedagogical Knowledge and Skill*
Curriculum Literacy	r		.658**
	p		.000
Pedagogical Knowledge and Skill	r	.658**	
	p	.000	

When Table 8 is considered, it is seen that there is a positive and significant relationship between pre-service teachers' curriculum literacy and pedagogical knowledge and skills [r= .658, n= 213, p< .01].

Discussion, Conclusion and Implications

Today, it is accepted that individuals should have literacy skills, one of the essential competence gains, to meet their needs in life, adapt to changing living standards, and participate in every part of society. Undoubtedly, educators guide individuals in the knowledge and skills they should have, shape human activities, and ensure that future generations are aligned with the desired goals. Teachers therefore need to have sufficient curriculum literacy and pedagogical knowledge and skills. Curriculums are road maps that enable educators to provide individuals with critical and analytical thinking skills. Teachers should be curriculum literate to obtain maximum efficiency from their curriculum. In addition, teachers' training program reveals that teachers should be able to acquainted with the dimensions of interpretation, application, and evaluation, and they should be equipped in terms of pedagogical knowledge and skills. This study aimed to determine the level of differentiation by examining the curriculum literacy and pedagogical knowledge and skills of preservice teachers related to various variables.

With reference to the research findings, preservice teachers' curriculum literacy levels are positive. This indicates that preservice teachers have a good level of curriculum literacy. Other studies show similar results that preservice teachers have good curriculum literacy skills (Aslan, 2018; Aygün, 2019; Erdem & Eğmir, 2018; Gündoğan, 2019; Süral & Dedebali, 2018). It can be said that these results indicate that preservice teachers improve their curriculum literacy in line with their preservice knowledge.

Preservice teachers' curriculum literacy does not show a significant difference related to gender variable. Aslan (2018), Erdem and Eğmir (2018), and Kızılaslan-Tunçer and Şahin (2019) similarly stated in their research that there is no significant difference in the curriculum literacy skills of teachers related to gender. One of the studies that do not overlap with the research findings is Erdamar (2020)'s research that teachers' curriculum literacy perceptions are higher in males than in females. Some other studies have concluded that female teachers and female

preservice teachers have higher curriculum literacy levels than male teachers and male preservice teachers (Aygün, 2019; Kahramanoğlu, 2019). The result obtained in the study regarding the differentiation of preservice teachers' curriculum literacy levels related to gender may have resulted from different sample groups.

It was concluded that preservice teachers' curriculum literacy showed a significant difference in the "reading" sub-dimension in terms of the grade variable. No significant difference was found in the "Writing" sub-dimension. As a result of the research, it was concluded that preservice teachers' "reading sub-dimension of curriculum literacy" skills improved with the increase in grade level. As the preservice teachers take the theoretical courses of the curriculum mainly in the third and last year, their curriculum literacy skills are expected to improve as the grade level increases. In Aygün (2019)'s research, it was seen that the fourth-grade preservice teachers' curriculum literacy levels were higher than the other grade levels. In Erdem and Eğmir (2018) studies, age was examined as a variable instead of the grade variable. In the study of Süral and Dedebali (2018), in which the curriculum literacy levels of preservice teachers were examined related to the grade variable, it was determined that there was a significant difference between the fourth-grade preservice teachers' reading and writing sub-dimensions and their curriculum literacy levels. In the study of Kızılaslan-Tunçer and Şahin (2019), which did not coincide with the research findings, they determined that the education curriculum knowledge levels of the preservice teachers did not show a significant difference related to the grade level.

Key to the research findings, it has been determined that the pedagogical knowledge and skills of the preservice teachers are at a reasonable level. This shows that the preservice teachers' pedagogical knowledge and skill levels are good. Meriç (2014) and Güler (2015) determined that preservice teachers have high self-perceptions about technological pedagogical content knowledge. The study of Bal and Karademir (2013) determined that preservice teachers consider themselves highly competent in pedagogical knowledge.

It was concluded that the pedagogical knowledge and skills of preservice teachers did not differ significantly related to gender variable. Similarly, Güler (2015) and Meriç (2014) concluded that the pedagogical knowledge and skills of preservice teachers did not differ related to gender variable. Hacıömeroğlu and Şahin-Taşkın (2012) also found that the mean pedagogical development level of preservice teachers did not differ related to gender. Mehmetlioğlu and Haser (2013) found that the readiness levels of preservice mathematics teachers did not differ related to the gender variable. Bulut (2012) and Erdoğan and Şahin (2010) found that the technological pedagogical knowledge of preservice teachers differed significantly in favor of male teachers. In the literature review, the insufficient number of studies examining the gender variable in terms of pedagogical knowledge and skills made it difficult to make comparisons. Therefore, it can be said that more research should be done on this subject.

Preservice teachers' pedagogical knowledge and skills differ significantly related to the grade variable. It was concluded in favor of 4th-grade students in the available total and all sub-dimensions. This finding may result from the pedagogical knowledge and skill levels that the preservice teachers acquired from the teaching profession courses during their undergraduate education are higher in the fourth grade (Bektaş et al., 2015). On the other hand, Hacıömeroğlu and Şahin-Taşkın (2012) determined that the pedagogical development

level averages of the preservice teachers resulted in favor of the 4th-grade preservice teachers. Similarly, in the study of Mehmetlioğlu and Haser (2013), preservice teachers' professional readiness levels show a significant difference related to the grade variable. This difference is that fourth-grade mathematics preservice teachers perceive themselves as ready for the profession at a higher level.

One of the most important results of the study is that there is a positive and significant relationship between preservice teachers' curriculum literacy levels and their pedagogical knowledge and skills. In his research, Aygün (2019) determined a meaningful positive relationship between the curriculum literacy levels of preservice teachers and their readiness for the teaching profession. A moderate positive relationship was found between preservice teachers' technological pedagogical content knowledge and classroom management skills (Ekici, 2018). When the literature is examined, a teacher with pedagogical knowledge and skills within the scope of "Teaching Profession General Competencies"; "Compares different strategies, methods, and techniques that can be used in teaching the field.", "Prepares teaching materials suitable for learning outcomes.", "Organises learning environments by taking into account the individual differences and needs of students.", "Creates learning environments that develop students' high-level cognitive skills.", "Compares the measurement and evaluation methods that can be used in the teaching processes of the field.", "Rearranges the teaching and learning processes with reference to the measurement and evaluation results." (General Directorate of Teacher Training and Development, 2017). It is thought that the defined teaching profession's pedagogical knowledge and skill competencies are related to curriculum literacy (Bolat, 2017).

As a result, it is understood that preservice teachers' views on their curriculum literacy are positive. Curriculum literacy levels of preservice teachers do not show a significant difference related to gender and grade level variables. When it comes to the grade variable, there is a substantial difference in the "reading" sub-dimension. In line with the research findings, it has been determined that the preservice teachers' pedagogical knowledge and skill levels are at a good level. The pedagogical knowledge and skills of preservice teachers do not show a significant difference related to gender variable. In terms of the grade variable, it was concluded in favor of the 4th-grade preservice teachers in the general total and all sub-dimensions. Finally, it was found out that there is a positive and significant relationship between the curriculum literacy levels of preservice teachers and their pedagogical knowledge and skill.

Similar studies with a larger sample groups can be conducted in other regions of Turkiye. The curriculum literacy and pedagogical knowledge and skill levels of preservice teachers can be examined with different variables such as the type of school graduated from, department, and parents being a teacher, which are not included in this study. This study is quantitative research. Qualitative studies or mixed studies can be conducted on curriculum literacy and pedagogical knowledge and skills.

Author Contributions

Conceptualization CD, AT; Data collection CD; Quantitative analysis AT, CD; Methodology AT, CD; Visualization AT; Writing—original draft AT, CD; Writing—review and editing AT, CD. All authors read and approved the final manuscript.

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TÜRKÇE GENİŞ ÖZET

Öğretmen Adaylarının Program Okuryazarlık Düzeyleri ile Pedagojik Bilgi ve Beceri Düzeylerinin İncelenmesi

Giriş

Bir programdan bütün öğrencilerin özel ilgi ve ihtiyaçları doğrultusunda yararlanabilmesi öğretmenin rehberliği ile gerçekleşir (Stabback, 2016). Bu doğrultuda eğitimcilerden; programı yorumlayabilmesi, uygulanan programın bileşenlerine uygun bir şekilde eğitim-öğretim sürecini sürdürmesi ve okuryazarlık becerilerini etkin kullanması beklenir. (Karagülle, Varki ve Hekimoğlu, 2019). Sonuç olarak program okuryazarlığı, tüm öğretmenlerin ve öğretmen adaylarının sahip olması gereken bir beceridir (Erdem & Eğmir, 2018). Program okuryazarlığı; eğitim programlarına ilişkin bilgi sahibi olma, programları yorumlayabilme ve mevcut koşullara uygun olacak şekilde eğitim programlarını uyarlayabilmedir (Keskin & Korkmaz, 2021).

Pedagojik bilgi ise sınıf yönetimi yeterliliği ve eğitim-öğretim ile ilgili beceriler olarak tanımlanır (Shulman, 1987). Okullarda bilimsel eğitim süreci içerisinde oluşan öğretmenlerin bilgi modeli, alanyazında tanımlanmış kavramlar, metotlar ve bir modelin sayısındaki bileşim olarak tasarlanmaktadır (Çiltaş & Akıllı, 2011). Bu modeli pedagojik bilgi olarak tanımlamışlardır.

Ülkemizde eğitim programlarının uygulayıcıları olan öğretmenleri yetiştirme işi eğitim fakültelerine verilmiştir. Gelecek nesilleri şekillendirecek olan öğretmen adaylarımızın program okuryazarlık düzeyleri ile pedagojik bilgi ve beceri düzeylerinin incelenmesi, ülkemizdeki eğitim fakültelerinde verilen eğitime dair bilgi vereceğinden önemli görülmektedir. Ayrıca bu araştırmanın program uygulayıcısı olan öğretmenlerde, program okuryazarlığının önemi hakkında farkındalık oluşturacağı ve program geliştirme uzmanları için bir bilgi kaynağı olacağı öngörülmektedir. Araştırma konusu ve bulguları, öğretmen yetiştiren kurumlar için yol gösterici olması açısından önemlidir. Bu doğrultuda öğretmen adaylarının program okuryazarlık düzeyleri ile pedagojik bilgi ve beceri düzeylerinin incelenmesi bu araştırmanın amacı olarak belirlenmiştir.

Yöntem

Öğretmen adaylarının program okuryazarlık düzeyleri ile pedagojik bilgi ve beceri düzeyleri arasındaki mevcut durumu ve ilişkiyi analiz etmeyi amaçlayan bu araştırma, nicel araştırma yöntemlerinden korelasyonel bir çalışmadır. Araştırmanın örneklemini bir devlet üniversitesinde öğrenim gören 213 öğretmen adayı oluşmaktadır. Veri toplama aracı olarak cinsiyet ve sınıf düzeyi değişkenlerinin yer aldığı kişisel bilgi formu, Eğitim Programı Okuryazarlığı Ölçeği, Pedagojik Bilgi ve Becerileri Ölçeği kullanılmıştır. Verilerin analizinde

öncelikle verilerin normalliği incelenmiştir. Normallik için medyan ve aritmetik ortalama değerleri, Kolmogorov-Smirnov ve Shapiro-Wilk testleri, Q-Q plot ve kutu grafikleri incelenmiştir. Verilerin normal dağılmadığı tespit edilmiştir. Verilerin analizinde Mann Whitney U testi, Kruskal Wallis testi ve Spearman Sıra Farkları Korelasyon Katsayısı ile kontrol edilmiştir.

Bulgular

Öğretmen adaylarının eğitim programı okuryazarlıklarının cinsiyet değişkenine göre farklılaşıp farklılaşmadığı verilerin normal dağılmamasından dolayı Mann Whitney U Testi ile analiz edilmiş, öğretmen adaylarının eğitim programı okuryazarlıklarının cinsiyet değişkenine göre hem alt boyutlarda hem de genel toplamda anlamlı bir farklılaşmanın olmadığı görülmüştür.

Öğretmen adaylarının eğitim programı okuryazarlıklarının sınıf değişkenine göre farklılaşıp farklılaşmadığı verilerin normal dağılım göstermemesinden dolayı Kruskal Wallis Testi ile analiz edilmiş, öğretmen adaylarının eğitim programı okuryazarlıklarının sınıf değişkenine göre farklılaşıp farklılaşmadığını test etmek için Kruskal Wallis Testi yapılmış ve grupların sıra ortalamaları arasında "Okuma" alt boyutunda ve toplamda anlamlı farklılık olduğu anlaşılmış; "Yazma" alt boyutunda ise anlamlı farklılık olmadığı anlaşılmıştır. Öğretmen adaylarının eğitim programı okuryazarlıklarının sınıf değişkenine göre farklılaşmanın hangi gruplar lehine olduğu çoklu karşılaştırma testleri sonucunda okuma alt boyutunda ve genel toplamda 4. sınıf öğretmen adayları ile 2. sınıf öğretmen adayları arasında 4. sınıf öğretmen adayları lehine olduğu anlaşılmaktadır.

Öğretmen adaylarının pedagojik bilgi ve becerilerinin cinsiyet değişkenine göre farklılaşıp farklılaşmadığı verilerin normal dağılmamasından dolayı Mann Whitney U Testi ile analiz edilmiş, öğretmen adaylarının pedagojik bilgi ve becerilerinin cinsiyet değişkenine göre hem alt boyutlarda hem de genel toplamda anlamlı bir farklılaşmanın olmadığı görülmüştür.

Öğretmen adaylarının pedagojik bilgi ve becerilerinin sınıf değişkenine göre farklılaşıp farklılaşmadığı verilerin normal dağılım göstermemesinden dolayı Kruskal Wallis Testi ile analiz edilmiş, grupların sıra ortalamaları arasında bütün alt boyutlarda ve toplamda anlamlı farklılık olduğu anlaşılmıştır. Öğretmen adaylarının pedagojik bilgi ve becerilerinin sınıf değişkenine göre farklılaşmanın hangi gruplar lehine olduğu çoklu karşılaştırma testleri sonucunda bütün alt boyutlarda ve genel toplamda 4. sınıf öğretmen adayları ile 2. sınıf öğretmen adayları arasında 4. sınıf öğretmen adayları lehine olduğu anlaşılmaktadır. Ayrıca "Önem ve İlgi" alt boyutunda 3. sınıf öğretmen adayları ile 2. sınıf öğretmen adayları arasında 3. sınıf öğretmen adayları lehine anlamlı farklılık olduğu tespit edilmiştir.

Öğretmen adaylarının eğitim programı okuryazarlıkları ile pedagojik bilgi ve becerileri arasındaki ilişkiyi belirlemek için Spearman Sıra Farkları Korelasyon Katsayısı hesaplanmış, öğretmen adaylarının eğitim programı okuryazarlıkları ile pedagojik bilgi ve becerileri arasında pozitif yönlü anlamlı bir ilişki olduğu anlaşılmıştır. Bu sonuç öğretmen adaylarının eğitim programı okuryazarlıklarının artması ile pedagojik bilgi ve becerilerinin de arttığı şeklinde yorumlanabilir.

Tartışma, Sonuç ve Öneriler

Öğretmen adaylarının eğitim programı okuryazarlık düzeylerinin araştırma bulgularına göre iyi düzeyde olduğu anlaşılmaktadır. Dolayısıyla öğretmen adaylarının iyi düzeyde program okuryazarı olduğu söylenebilir.

Öğretmen adaylarının program okuryazarlık becerilerine ilişkin bilgi düzeyleri cinsiyet değişkenine göre anlamlı farklılık göstermemektedir. Öğretmen adaylarının program okuryazarlık becerilerine ilişkin bilgi düzeyleri sınıf değişkenine göre "okuma" alt boyutunda anlamlı bir farklılık göstermektedir. "Yazma" alt boyutunda ise anlamlı bir farklılık olmadığı anlaşılmıştır. Araştırma sonucunda öğretmen adaylarının sınıf seviyesi arttıkça "okuma" becerilerinin de geliştiği bilgisine ulaşılmıştır.

Öğretmen adaylarının pedagojik bilgi ve becerilerinin iyi düzeyde olduğu tespit edilmiştir. Öğretmen adaylarının pedagojik bilgi ve beceri düzeyleri cinsiyet değişkenine göre anlamlı bir farklılık göstermemekle birlikte, sınıf değişkenine göre anlamlı farklılık göstermektedir. Genel toplamda ve bütün alt boyutlarda 4. sınıf öğrencileri lehine sonuçlanmıştır.

Genel araştırma amacı kapsamında ulaşılan sonuca göre, öğretmen adaylarının program okuryazarlık düzeyleri ile pedagojik bilgi ve becerileri arasında pozitif yönlü anlamlı bir ilişki olduğu sonucuna ulaşılmıştır.

Öneriler

Eğitim fakültelerinde ve öğretmen yetiştiren yükseköğretim lisans programlarında öğretmen adaylarına ders planlama, sınıf yönetimi ve programı uygulama alanlarına yönelik ilgili derslerin öğretim programındaki ders saat süresi artırılabilir. Öğretmen adaylarının "okuma" ve "yazma" becerilerinin gelişimini desteklemek için tasarlama ve yaratıcı düşünme becerilerine katkı sağlayacak dersler öğretim programına dahil edilerek adayların gelişimlerini tamamlamaları sağlanabilir. Daha geniş örneklem grubu ile benzer araştırmalar Türkiye'nin diğer bölgelerinde de gerçekleştirilebilir. Öğretmen adaylarının program okuryazarlık ve pedagojik bilgi ve beceri düzeyleri; bu araştırma kapsamında ele alınmayan mezun olunan okul türü, bölüm, ebeveynlerin öğretmen olması gibi farklı değişkenlerle incelenebilir. Bu çalışma nicel bir araştırmadır. Program okuryazarlığı ve pedagojik bilgi ve beceri üzerine nitel çalışmalar veya karma araştırmalar yapılabilir.