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An Examination of the Relationship between Views on Teaching Styles and Pedagogical Literacy of Pedagogical Formation Training Students

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Abstract

This study describes the relationship between pedagogical formation training students' views on teaching styles and the phenomenon of pedagogical literacy, which is regarded to be of crucial importance for the teaching profession. Relational survey method was used to determine the relationship between the study variables. The sample group consisted of 203 students enrolled in a variety of departments but attending pedagogical formation training during the 2017-2018 academic year. For collecting data, two different scales were administered. The first scale was Grasha's Teaching Style Scale and the other was the "Pedagogical Literacy Skills Scale". Pearson product-moment correlation technique and multiple regression analysis were used to define the relationship between these variables. It was found out that students prefer the facilitator model the most, while formal authority is the least preferred teaching style. Moreover, males prefer the formal authority and delegator teaching styles considerably more than females. Also, female students find themselves strikingly proficient about the teaching-learning skills compared to their male peers. As for the relationship between teaching styles and pedagogical literacy, the highest relation exists between "teaching-learning" in the pedagogical scale and "facilitator teaching style" in Grasha's scale. On the other hand, the lowest relation is found between "classroom management" skill and "formal authority style" at significant level in positive direction. As a conclusion, it is thought that effectiveness of pedagogical literacy on teachers' teaching styles deserves much attention. Thus, future research should deal with the issue accordingly.

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Pedagojik Formasyon Eğitimi Programı Öğrencilerinin Öğretim Stillerine İlişkin Görüşleri İle Pedagojik Okuryazarlıkları Arasındaki İlişkinin İncelenmesi*

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Özet

Bu çalışmada, pedagojik formasyon eğitimi programı öğrencilerinin öğretim stillerine ilişkin görüşleri ile pedagojik okuryazarlık kavramı arasındaki ilişkiyi belirlemek amaçlanmıştır. Araştırmada değişkenler arasındaki ilişkiyi belirlemeyi amaçlayan ilişkisel tarama yöntemi kullanılmıştır. Araştırmanın çalışma grubu; 2017-2018 eğitim-öğretim yılında formasyon programına katılan farklı branşlardaki 203 öğrenciden oluşmaktadır. Bu kapsamda, "Grasha Öğretim Stili Ölçeği" ve "Pedagojik Okuryazarlık Becerileri Ölçeği" kullanılmıştır. Öğrencilerin pedagojik okuryazarlık düzeyleri ile öğretim stillerine ilişkin görüşleri arasındaki ilişkiler Pearson Momentler Çarpımı Korelâsyon tekniği ve çoklu regresyon analizi ile değerlendirilmiştir. Çalışma sonucunda; formasyon programına katılan öğrencilerin öğretim stillerine ilişkin en çok kolaylaştırıcı model, en az ise otorite öğretim stilini tercih ettikleri bulunmuştur. Bunun yanında erkek öğrencilerin kadınlara göre baskın şekilde otorite ve temsilci öğretim stillerini tercih ettikleri belirlenmiştir. Ayrıca kadın öğrencilerin erkeklere göre baskın şekilde öğretme-öğrenme becerisi yönünden kendilerini daha iyi gördükleri bulunmuştur. Öğretim stilleri ile pedagojik okuryazarlık arasındaki ilişki ele alındığında ise en yüksek "öğretme-öğrenme" alt boyutu ile "kolaylaştırıcı öğretim stili" arasında; en düşük ise "sınıf yönetimi" becerisi ile "otoriter öğretim stili" arasında pozitif yönde anlamlı ilişki olduğu belirlenmiştir. Çalışma sonunda elde edilen bulgulara göre öğretmenlerin sahip olduğu öğretim stilleri üzerine pedagojik okuryazarlığın etkililiği, üzerinde önemle durulması gereken bir konu olarak düşünülmüş; bu suretle araştırmaların farklı kapsamlarda devam etmesi gerektiği önerilmiştir.

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Introduction

Most factors influencing successful design of learning-teaching process also have an impact on the implementation of the curriculum. Individual differences such as teachers' teaching format, competences, and attitudes towards the profession come to the fore in relation with efficiency of teaching (Kiremit, 2006). According to Bilgin, Uzuntiryaki, and Geban (2002), a teacher's behaviors exhibited permanently and consistently during interactions with students in educational- instructional context denote the teacher's teaching style. The teachers' style basically manifests itself through behaviors such as the method, technique, enforcement, activating students in the lesson, giving feedback, making clarifications, and asking questions employed during the teaching process. Teaching style is defined as a combination of the teacher's performance in classroom, beliefs, needs, and knowledge related to pedagogy. Grasha's (2002a) model of teaching style based on teacher behaviors outlines five categories as expert, formal authority, personal model, facilitator, and delegator.

Expert: The teacher with the style of expert has the knowledge and expertise students need. It is the teacher her/himself who decides on when and how to do the teaching, the content of teaching, the materials to be used, and the physical properties of the learning environment. The style of expert transfers characteristics of a conventional teacher to the application process. The purpose of a teacher in this model is to transfer the knowledge and equip learners well. The teacher includes details in the transfer of knowledge and coaches situations in which students run into a contradiction so that the students' competence level can be increased. Teachers who adopt the teaching style of expert do not necessarily disclose the thinking processes underlying the answers. Despite several positive characteristics of this teaching style such as the teachers' having knowledge, competence, and ability; its overestimation may discourage students who do not have sufficient experience with the knowledge transferred.

Formal Authority: In this model, the teacher holds a distinct status before students due to her/his knowledge and the role she/he has adopted. She/he teachers clearly explains the expected student behaviors and the rules to be obeyed. Teachers who possess the teaching style of formal authority as the dominant teaching style tend to guide students according to these standards, mostly leaving students' interest secondary. They give positive and negative feedback on compliance with the rules. They also point out the acceptable and standard means of the matter in question without taking into account the interest of students. The style of formal authority differs from expert in that the teacher in the former model sticks to the rules more tightly and gives feedback to the students.

Personal Model: It is a teaching style which students can take as a model for behavior and thinking that is to believe in teaching by giving personal examples. It encourages students to observe and imitate the teacher's approach. The teacher coaches and guides students. Some of the teachers adopting this teaching style believe that their approach is good and unique and expect learners to exhibit behavior. This overtakes the students with excessive adherence to their own behaviors and leads to missing of different opportunities by students. The model has a disadvantage that if the student fails to meet the standards of the model, she/he feels incompetent.

Facilitator: It is the teaching style which emphasizes teacher-student communication. In this model, the teacher is flexible in their relationships with students and is sensitive to individual needs of them. The teacher tries to align the goal and content of teaching and instructional strategies to be used with the characteristics of the students. She/he also aims to enhance students' ability to act independently and to take initiatives and responsibilities. The style is characterized by student-centered process. As a part of this fact, the teacher works on projects with the students, provides guidance, and encourages them to be successful. In

addition, she/he tries to understand the ideas of the students by asking questions, provides alternatives in this regard, and guides the students in acquiring the knowledge. The main disadvantage of this teaching style is that it is time consuming and leads to discomfort in the learner if it is not properly applied.

Delegator: If a teacher adopts it as the chief teaching style, her/his paramount concern is to help students' development at the extent sufficient for themselves. She/he supports the students to work individually and independently. Therefore, the students can work independently or individually in group projects. As for the teacher, she becomes responsible for being the reference person. In other words; she/he assumes to be a consultant who answers the students' questions and gives feedback periodically.

Broadly speaking, teachers take some teaching methods into account in order to achieve the goals of the course. If the method a teacher uses represents a pattern of consistent teaching behaviors, the teacher's style can be said to be identified with this method (Table 1). This means that the teacher has invented her/his own style. It is important that the teacher know what her/his dominant teaching style basically means. It is likely that a teacher will be much more productive once they know their dominant teaching style (Kullinha and Cothran, 2003).

Table 1. Teaching roles, attitudes and behaviors according to Grasha's teaching styles.

Teaching styles	**Teaching roles**
Expert	Formative consultant
	Interrogator
	Brief ıeaching
Formal Authority	Feedback provider (Evaluative / Summarizer)
Personal Model	Coach (Trainer)
	Role model
	Feedback provider (Non-Evaluative/Formative)
Facilitator	Feedback provider (Non-Evaluative/Formative)
	Active listener
	Discussion facilitator
	Interrogator (Open-ended)
Delegator	Consultant
	Reference person

(cited by Grasha, 2002b)

Nowadays, technology has made things widespread especially the Internet, information circulation has reached tremendous speeds, and those who are able to control information are preferred rather than omniscient individuals. As a result, it is not enough for individuals to have a command of their expertise fields only. Instead, they are expected to be "literate" in their respective fields of expertise. For this reason, literacy terminology is being prepared in every field and attempts are being made to reveal the discipline and skills of each type of literacy. With its changing definition, literacy has begun to differentiate from acts of reading and writing. This differentiation has introduced the literature a new kind of literacy. Pedagogical literacy can be considered among them. According to Karakuş (2015), pedagogical literacy can be defined as a specific type of competence which enables teachers to make knowledge-based decisions in the selection of pedagogical instruments used in their educational lives. Apart from this, it can be defined as the capacity of teachers to understand and recognize the role of pedagogy in education besides their ability to make pedagogical decisions in the face of pedagogical issues at school, in community, or in their private lives. Pedagogical literacy does not only mean to have knowledge. It does not mean to have a specific attitude or providence, either. Briefly, pedagogical literacy refers to possessing and internalizing the qualities necessary for effective teaching.

It is also possible to apply Bybee's (1997) five levels of scientific literacy to pedagogical literacy which teachers should possess.

1. Pedagogical Literacy: It means teachers' inability to see problems, events, or issues pedagogically or devise pedagogical solutions. Furthermore, they cannot make sense of the terms and concepts related to pedagogy.

2. So-called Pedagogical Literacy: Teachers at this level are capable of defining the pedagogical concepts and terms at a certain degree. Yet, they are unable to interpret or apply them adequately. They cannot develop a pedagogical view of a situation.

3. Functional Pedagogical Literacy: Teachers at this level can use pedagogical words and concepts but in the same cognitive manner as writing the answer in a puzzle only.

4. Conceptual and Procedural Pedagogical Literacy: At this level, teachers can memorize the terms and also understand and apply pedagogical concepts in the face of problems, questions, and events. At this level, they are able to associate the concepts with each other and comprehend this relationship. Examples include teachers' solving problems faced by students and enabling their learning, being controlled, changing behaviors, and gaining through pedagogical methods and procedures. This is the stage each teacher should reach.

5. Multi-dimensional Pedagogical Literacy: Teachers at this level understand the history of pedagogy and the nature of education and the relationship of education to society. Such a teacher has gone far beyond multidimensional pedagogical literacy and thus gained an understanding and digestion of pedagogy. At this stage, there are teachers who can guide the education, have developed themselves, are able to guide the society, and can be mentors in both academic and spiritual terms (Bybee, 1997).

Inspired by the facts above, we designed this study to find out the pedagogical literacy levels of students who are enrolled in the Pedagogical Formation Education Program, which plays an important role in teacher training these days, and to discuss their pedagogical literacy levels in relation with their views on teaching styles. The motivation for the study was our belief that investigating students' teaching styles and effects of pedagogical literacy skills on teaching style preferences is crucial for understanding and interpreting behaviors of those students, who are about to step into teaching as a profession. Thus, this study aimed at finding out whether there is a relationship between the preferred teaching styles and pedagogical literacy levels of students studying in faculties except for Faculty of Education. In this study, these two specific variables were discussed assuming that pedagogical literacy level of candidate teachers may affect their selection of teaching style in the instructional setting. Each sub-variable of the teaching style was evaluated as a dependent variable. There are 5 sub-variables of each variable. In this scope, the concepts of teaching style and pedagogical literacy were examined first. Then investigation was carried into the extent at which the candidate teachers possess these concepts, whether there is an interaction between the two variables or sub-dimensions, and whether there is a positive or negative correlation between the variables or sub-variables. To sum up, mutual relations were discussed extensively under 'the literature on social externalities' as a part of exploring the relationship, if any, between the teaching styles and pedagogical literacy levels among pedagogical formation students. According to this model, a specific factor might be the cause and/or reason for another specific factor, and the other specific reason and/or reason might be the new cause and/or reason for another non-specific factor(s).

Significance of Study

This research is considered significant as it aims to evaluate both the teaching styles and pedagogical literacy levels of the pedagogical formation beneficiaries from a relational perspective. In addition, it is expected to substantially contribute to the relevant literature by determining the extent and dominant type of the students' teaching styles and pedagogical

literacy levels. Further significance comes from the fact that it studies candidate teachers' teaching styles and pedagogical literacy levels against certain variables. Apart from these, the present research is likely to inspire and contribute to other studies due to its focus on the relationship between students' teaching styles and pedagogical literacy levels. We hope that the findings of the study will contribute to education in several regards. The contribution is varied including determination of the teaching styles and pedagogical literacy levels of student teachers, building a different perspective on what should be done to gain or develop these conceptions through pre-service and in-service training, and helping student teachers to enhance their proficiency about teaching styles, philosophical approaches, teaching-learning process and classroom management. Particularly, it is hoped to provide benefits for the policies related to models of training mathematics teachers as a part of our education system.

Review of Literature on the Teaching Styles

The relevant literature offers studies on teachers and pre-service teachers' epistemological beliefs, technological pedagogical content knowledge, and the relationship between instructional anxiety and teaching styles (Kaleci, 2012; Kaya and Ekici, 2017; Mutluoğlu, 2012; Mutluoğlu and Erdoğan, 2016; Sarı and Aksoy, 2016; Şentürk, 2010); teaching styles employed by members of faculty at universities (Kulaç, 2013; Sürel, 2010); teaching styles adopted by teachers in general (Ağgez, 2015; Altay, 2009; Bilgin and Bahar, 2008; Gencel, 2013; Gülten and Özkan, 2014; Karataş, 2014; Kılıç and Dilbaz, 2013; Küçük and Bedir, 2016; Mete and Bakır, 2016; Şahin, 2010; Şahin, 2015; Üredi, 2006; Üredi, 2011); the relationship between students' academic achievement, self-regulation skills, motivation and teaching styles of teachers (Aktan, 2012; Damrongpanit and Reungtragul, 2013; Yurtseven, 2010); and teaching styles measuring instruments (Güven et al., 2016).

Review of Literature on Pedagogical Literacy

In the related literature, specific studies are available such as "The new pedagogical literacy need aroused by technological literacy in education" by Adıgüzel (2012) and "the relationship levels between pedagogical literacy skills and job satisfaction of high school teachers" by Karakuş (2015) and Usta and Karakuş (2016). Although the concept of teaching style has been studied intensively in both Turkish and international literature for many years, the concept of pedagogical literacy has not been found in studies carried out in Turkey. Furthermore, only a limited number of studies are available in the international literature with superficial or indirect samples only. As can be understood from the literature background above, it can be said that the relationship between teachers' teaching styles with many variables has been dealt with in abundance of studies so far. Conversely, the present study was carried out to shed light onto the relationship between teachers' preferential teaching styles and their pedagogical literacy levels, seeking to attain the following sub-goals:

1. To find out what type and extent of teaching styles and pedagogical literacy skills are adopted by students attending the Pedagogical Formation Training Program and,
2. In the light of the findings from the relationship between pedagogical literacy levels and teaching styles, to find out in what way pedagogical literacy predicts the dominant teaching style.

Method

Research Design

In this study, relational survey method was used, which aims to determine the relationship between variables under consideration. In research carried out with this model, the target is to

identify the relations between two or more variables and to reveal the cause-effect relations (Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel, 2016). In the present study, the model was utilized to find out the relationship between pedagogical literacy levels of students and their views on teaching styles. It investigates the pedagogical literacy skills and opinions on teaching styles of students registered in the Pedagogical Formation Training Program offered at a Faculty of Education (students coming from majors such as History, Accounting, Philosophy / Guidance and Health Care / Patient and Elderly Services). For collecting study data, two instruments were used. One of them is Grasha's Teaching Style Scale translated and adapted into Turkish by Sarıtaş and Süral (2010) along with reliability and validity checks. The other is the scale developed by Karakuş (2015) for the purpose of measuring pedagogical literacy skills of teachers at high schools.

Study Group

The study group consists of students with a variety of majors but attending the pedagogical formation program during the 2017-2018 academic year. Demographic information about the study participants is given in Table 2.

Table 2. Personal information of participants.

Variable	Type	N	%
Sex	Female	154	75.9
	Male	49	24.1
Age	20-25 years	119	58.6
	26-30 years	42	20.7
	31-35 years	25	12.3
	36-40 years	13	6.4
	41 years and above	4	2.0
Teaching as a Profession	Yes	51	25.1
	No	152	74.9
Undergraduate Study	Completed	90	44.3
	Not completed	113	55.7
Total		203	100

Table 2 shows that the participants included 154 females (75.9%) and 49 males (24.1%). In relation with age, 119 of the participants are aged 20 to 25 years (58.6%), 42 are 26 to 30 years old (20.7%), 25 between 31 and 35 years old (12.3%), 13 are aged at 36 to 40 (6.4%), and 4 participants are aged and above 41 (2.0%). As regards to the status of teaching as a profession, it is seen that 51 of them (25.1%) are teaching, while the rest of 152 are not (74.9%). In total, 203 students participated in our study.

Data Collection Tools

In the study, three different scales were used. First, the views of the pedagogical formation beneficiaries on teaching styles were explored by using Grasha-Reichmann's "Grasha's Teaching Style Scale" (Grasha, 2002a). Second, the "Pedagogical Literacy Scale" was used to measure their pedagogical literacy levels (Karakuş, 2015). As the last instrument, a "Personal Information Form" was used in order to collect information on participants' demographics;

*Grasha's Teaching Style Scale***.** The Cronbach's alpha reliability coefficient of the teaching style scale is 0.89. Grasha Teaching Style Scale was developed by Grasha (2002a) and adapted into Turkish by Üredi (2006). This scale consists of a total of 40 items in five-point Likert type, with five main categories as expert, formal authority, personal model, facilitator, and delegator;

with 8 statements under each category (Table 3). The measurement tool is designed as totally disagree: 1, disagree: 2, not sure: 3, agree: 4, completely agree: 5. First of all, the mean scores from each sub-scale were calculated and compared internally. Later, the scores were checked to find out whether they differ against variables or not. Finally, the relationships among all sub-scales were evaluated and also they were checked to see probable connections with sub-variables of teaching styles. On the grounds of the analyses existing in the literature, it was decided that the measurement tool could be used as a valid and reliable scale for teachers and pre-service teachers.

Table 3. Sub-scales and number of items in the teaching style scale.

Teaching Styles	**Degree of Teaching Styles**			**Number of Items**
	Low	**Medium**	**High**	
Expert	(1.0 – 2.8)	(2.9 - 3.8)	(3.9 - 5.0)	1-6-11-16-21-26-31-36
Formal Authority	(1.0 – 2.8)	(2.9 - 3.8)	(3.9 - 5.0)	2-7-12-17-22-27-32-37
Personal Model	(1.0 – 2.8)	(2.9 - 3.8)	(3.9 - 5.0)	3-8-13-18-23-28-33-38
Facilitator	(1.0 – 2.8)	(2.9 - 3.8)	(3.9 - 5.0)	4-9-14-19-24-29-34-39
Delegator	(1.0 – 2.8)	(2.9 - 3.8)	(3.9 - 5.0)	5-10-15-20-25-30-35-40

*Pedagogical Literacy Scale***.** As the first scale used in this study, the Pedagogical Literacy Scale was developed by Karakuş (2015) and consists of 31 items. The validity and reliability studies of this scale were performed by Karakuş (2015) (Cronbach's Alpha= 0,929). It is 5-point Likert-type scale, which has the following range: "I am not content at all"; 1 point, "I am not content"; 2 points, "I am indecisive"; 3 points, "I am content"; 4 points, "I am very content"; 5 points. There are no negative statements in the scale. The scale consists of 31 decisive traits concerning "teaching-learning process", "classroom management", and "guidance". 1- Teaching-learning process: Items 1, 2, 4, 6, 8, 10, 11, 12, 13, 14, 15, 16, 17, and 20; 2- Classroom management: Items 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, and 31; 3- Guidance: Items 3, 5, 7, 9, 18, and 19. The teaching-learning process factor score is calculated by dividing the scores obtained from 14 items by 14; classroom management factor score by dividing the scores of 11 items by 11, and the guidance score was calculated by dividing the scores of the relevant items by 6.

*Personal Information Form***.** In order to find out certain facts about the study participants, a personal information form was developed by researchers. The form consists of questions about gender, age, status of teaching as a profession, and undergraduate status of respondents.

Implementation

Prior to apply the measurement tools to participants, permits were obtained from the researchers who developed the scales. After this step, the researchers administered the scales directly to 203 students attending the Pedagogical Formation Training Program from a variety of majors. None of the measurement tools were left incomplete. Therefore, the analysis of the research was performed on data from the total of 203 participants.

Data Analysis

The relationship between the students' pedagogical literacy levels and their views regarding teaching styles was calculated by using the Pearson product-moment correlation technique. As for the effects of the pedagogical literacy levels on their views regarding teaching styles, multiple regression analysis was performed. The relation and strength of the correlation analysis were graded in three levels as 0.70-1.00 high; 0.69-0.30 as medium, and 0.29-0.00 as low. During the data analysis, Mahalonobis distance values and skewness and kurtosis values were checked before starting the regression analysis.

The data nonconforming to the assumption of normality were excluded from the analysis. The data set was also checked in relation with multiple linearity assumptions. It was found out that the students' pedagogical literacy and teaching style scores show a normal distribution (p>.05). In this regard, parametric statistical tests were applied in order to determine whether there is a differentiation between the two groups as regards to views on teaching styles and pedagogical literacy skills. The relevant statistical analyses were performed by using SPSS 22.0 (Statistical Package for Social Sciences).

As the dependent variable of the study, predictive power of the students' views on teaching styles based on the pedagogical literacy levels was calculated with multiple linear regression analysis. This analysis was carried out only after it was tested whether certain conditions are met. The results of the analyses are presented in the section dedicated to results.

Findings

In this section, the findings relating to the study sub-goals are given in the following order.

Descriptive Information on Study Variables

In order to find out the extent of the students' views on teaching styles and their pedagogical literacy skills, descriptive information is given in Table 4.

Table 4. Descriptive statistics for variables.

Variables	Sub-variables	$\overline{X}$	SS
Teaching style	Expert	3.8596	.44897
	Formal authority	3.6915	.48401
	Personal model	4.0222	.48918
	Facilitator	4.2007	.42857
	Delegator	3.7728	.46274
Pedagogical literacy	Teaching-learning	4.4933	.45585
	Classroom management	4.4653	.45207
	Guidance	4.0780	.52082

When Table 4 is examined, it can be seen that the highest arithmetic mean out of 5 was obtained from the teaching style of facilitator (X=4.2007; s:.42857), while the lowest arithmetic mean was obtained from the teaching style of formal authority (X=3.6915; s=.48401). Apart from this, the values of pedagogical literacy skills demonstrate that the students gained the highest score from the sub-variable of teaching-learning (X=4.4933; Ss=.45585). On the contrary, guidance yielded the lowest score (X=4.0780; s=.52082).

Table 5. T-test results of pedagogical formation training students' views on teaching styles and pedagogical literacy skills as distributed by gender

		Gender	N	$\overline{X}$	Ss	t	p
Teaching styles	Expert	Female	153	3.8211	.45653	-1.870	.063
		Male	47	3.9601	.40806		
	Formal authority	Female	153	3.6381	.47818	-2.676	.008**
		Male	47	3.8511	.47394		
	Personel model	Female	153	4.0114	.46137	-.283	.777
		Male	47	4.0346	.57442		
	Facilitator	Female	153	4.1985	.43100	.285	.776
		Male	47	4.1782	.42007		
	Delegator	Female	153	3.7328	.45116	-2.027	.044*
		Male	47	3.8883	.48708		
Pedagogical literacy	Teaching-learning	Female	153	4.5266	.45345	1.992	.048*
		Male	47	4.3845	.44347		

	Classroom management	Female	153	4.4819	.43649	1.158	.248
		Male	47	4.3946	.50055		
	Guidance	Female	153	4.0937	.53216	.958	.339
		Male	47	4.0106	.47575		

Table 5 reveals that there are significant differences between two genders in connection with two of the teaching styles, formal authority and delegator namely. It implies that male students prefer teaching styles of formal authority and delegator at statistically higher levels than female students. In addition, from the perspective of pedagogical literacy skills, the scores of male and female students were significantly different under the sub-variable teaching-learning. In other words, it was seen that female students have higher pedagogical literacy scores than males in relation with teaching-learning.

Table 6. T-test results of pedagogical formation training students' views on teaching styles and pedagogical literacy skills as distributed by status of teaching

		Teaching as a profession	**N**	$\overline{X}$	**Ss**	**t**	**p**
Teaching styles	Expert	Yes	51	3.9142	.39567	.981	.328
		No	151	3.8427	.46647		
	Formal authority	Yes	51	3.6838	.49393	-.136	.892
		No	151	3.6945	.48383		
	Personal model	Yes	51	4.1348	.46492	1.833	.068
		No	151	3.9925	.48396		
	Facilitator	Yes	51	4.2549	.39604	.991	.323
		No	151	4.1863	.43777		
	Delegator	Yes	51	3.7917	.43349	.323	.747
		No	151	3.7674	.47479		
Pedagogical literacy	Teaching-learning	Yes	51	4.5770	.44763	1.561	.120
		No	151	4.4622	.45653		
	Classroom management	Yes	51	4.4848	.47051	.330	.741
		No	151	4.4606	.44803		
	Guidance	Yes	51	4.1307	.55409	.882	.379
		No	151	4.0563	.50913		

According to Table 6, there is no significant difference between the participants' opinions about teaching styles and their pedagogical literacy scores against their status of teaching. To put in a different way, the students who have taught scores of teaching style and pedagogical literacy quite close to their peers who have not taught.

Table 7. T-test results of pedagogical formation training beneficiaries' views on teaching styles and pedagogical literacy skills as distributed by undergraduate study.

		Completed	N	$\overline{X}$	Ss	t	p
Teaching styles	Expert	Yes	89	3.8357	.45368	-.938	.349
		No	108	3.8958	.44285		
	Formal authority	Yes	89	3.6011	.50420	-2.489	.014*
		No	108	3.7697	.44570		
	Personal model	Yes	89	4.0126	.47563	-.611	.542
		No	108	4.0544	.47859		
	Facilitator	Yes	89	4.2247	.44919	.310	.757
		No	108	4.2060	.39724		
	Delegator	Yes	89	3.7317	.44854	-1.380	.169
		No	108	3.8229	.47179		
Pedagogical literacy	Teaching-learning	Yes	89	4.5449	.48005	1.383	.168
		No	108	4.4563	.41865		
	Classroom management	Yes	89	4.5260	.45444	1.394	.165
		No	108	4.4394	.41660		
	Guidance	Yes	89	4.1704	.53299	2.206	.029*
		No	108	4.0077	.49994		

Table 7 demonstrates significant difference only in formal authority out of five sub-variables concerning students' teaching styles in relation with the status of completion of the undergraduate study. In other words, the candidate teachers who are still doing their undergraduate study prefer the teaching style of formal authority at a significantly higher level than others. Considering the pedagogical literacy skills, significant difference was found between the participants in connection with the guidance sub-variable. It means that the participants who have already completed their undergraduate study have higher scores of pedagogical literacy than others in particular relation with guidance.

Findings on the Relationship between the Independent Study Variables and Teaching Styles

Within the scope of "determination of the relationship between the independent variables of the study and teaching styles" as another goal of this study, a simple correlation was performed first. The results of the analysis are presented in Table 8.

Table 8. Simple correlation analysis on the relationship between pedagogical literacy skills and teaching styles.

	Expert TS	Formal authority TS	Personal model TS	Facilitator TS	Delegator TS	PL Teaching-learning	PL Classroom management	PL Guidance
Expert TS	1	.576**	.588**	.595**	.572**	.295**	.317**	.210**
Formal authority TS		1	.549**	.507**	.530**	.206**	.191**	.099
Personal model TS			1	.610**	.521**	.356**	.335**	.225**
Facilitator TS				1	.558**	.478**	.392**	.336**
Delegator TS					1	.116	.061	.112
PL Teaching-learning						1	.722**	.657**
PL Classroom management							1	.524**
PL Guidance								1

*PL: Pedagogical Literacy; TS: Teaching Style; ** p<.01 significance level*

As seen in Table 8, the Pearson product-moment correlation coefficient revealed that there is a significant positive relation between pedagogical literacy skills and teaching styles. Such relations occur at the highest level between the teaching styles of facilitator (r=.610; p<.01) and personal model among all the teaching styles, and also between facilitator and expert (r=.595; p<.01). On the contrary, the lowest level of relationship was found between the teaching styles facilitator and delegator (r=.558; p<.01). Looking at the relationship among the sub-variables of pedagogical literacy skills, one will notice significant positive relations between "classroom management" and "teaching-learning" (r=.722; p<.01), between "guidance" and "teaching-learning" (r=.657; p<.01), and "guidance" and "classroom management" (r=.524; p<.01). From the perspective of the relation between teaching styles and pedagogical literacy, the highest level of significant relationship occurred between the pedagogical literacy level of "teaching-learning" and the teaching style of "facilitator" (r=.478; p<.01); whereas the lowest value was obtained from "classroom management" and "formal authority" (r=.191; p<.01). On the other hand, the teaching style of delegator proved to significantly relate to any of the sub-variables of pedagogical literacy. In addition to this, it was found out that "guidance" yielded no significant correlation coefficient value with formal authority.

Findings on the Prediction of Students' Teaching Styles from Pedagogical Literacy Skills

For the third goal of the research, multiple linear regression analysis was performed to find out in what way "pedagogical literacy skills predict views on teaching styles". The regression analysis was carried out only a set of assumptions was met including single normality, multiple normality, multi-collinearity, and linearity with the results given below.

Testing Assumptions of Multiple Linear Regression Analysis

Single Normality Test: As a part of testing the multiple linear regression analysis, single normality assumption was tested. Skewness and kurtosis coefficient values were calculated to find out whether the variables show a normal distribution. These values are presented in Table 9 together with results of certain descriptive statistics.

Table 9. Descriptive statistics and skewness and kurtosis coefficients regarding the study variables.

Variable	Skewness	Kurtosis
Expert	.167	-.139
Formal authority	.225	.228
Personal model	-.353	.322
Facilitator	-.189	.114
Delegator	.577	.115
Teaching-learning	-1.916	6.080
Classroom management	-1.486	3.360
Guidance	-.459	.237

It is assumed that variables are normally distributed if the skewness coefficient is below |3.0| and kurtosis coefficient is below |10.0| (Kline, 2011). As can be seen in Table 9, the skewness and kurtosis coefficients of the study variables are smaller than the threshold values. Therefore, it can be said that the variables have single normality.

Multiple Normality Test: Another assumption as a prerequisite for multiple linear regression analysis is whether the variables have multiple normality. To this end, Mahalonobis distance value was calculated to decide whether the variables have extreme values. It is suggested to remove extreme values from the data set (Can, 2013). Considering that there are

five dependent variables and three independent variables in this study, the degree of freedom (sd) which corresponds to the significance level of 0.01 in the Chi-Square distribution table is 13.74 (Laurencelle and Dupuis, 2002). The analysis demonstrated that none of the Mahalonobis values for the variables is higher than the values in the table above. Thus, it is assumed that the variables satisfy multiple normality.

Multi-Collinearity Test: Another assumption checked for multiple linear regression analysis is the level of relationships between variables. In this context, it was tested whether there is a multicollinarity problem concerning the relationship between variables. Correlation between variables over .90 indicates the existence of multicollinarity problem (Şencan, 2005). In this study, the correlation coefficients between the variables were found to vary between .191 and .722 (Table 8). It can be inferred from these results that the relationship between the variables is below .90, referring to the lack of multicollinarity. Also, the multicollinarity problem was tested by calculating the Variance Inflation Factor (VIF) and Tolerance Value (TV). If the VIF value is smaller than 10 and the TV is larger than 0.2, it is assumed that there is no multicollinarity (Field, 2009). The VIF and TV calculations are given in Table 10. The values reveal that multicollinarity is out of question in the case of our variables.

Auto-Correlation Test: Another assumption controlled before multiple linear regression analysis is testing of whether there is an autocorrelation between the variables. For this purpose, Durbin Watson coefficient was calculated, which must be between 1.5 and 2.5 (Kalaycı, 2009). The mean Durbin-Watson coefficient was found to be 2.526, which means there is no autocorrelation between the variables in this study (Table 10).

Linearity Test: Lastly, a testing was performed to see whether there is a linear relationship between independent variables and dependent variables and whether the scores show a normal distribution. When each graph was evaluated, it was concluded that there is a linear relationship in the histogram and scatter diagram and the points are clustered around an axis.

Multiple Linear Regression Analysis

Above are elaborated the assumptions tested as a prerequisite for performing multiple linear regression analysis. As a result, all of the mentioned assumptions were met. Next, it was attempted to analyze how each sub-variable of teaching styles, which is the dependent study variable, predicts each sub-variable of pedagogical literacy skills, which is considered as the independent study variable. The results of multiple linear regression analysis performed for this purpose are presented in Table 10.

Table 10. Multiple linear regression analysis on prediction of teaching styles from pedagogical literacy skills.

	Independent variable	**B**	**Std. Error**	**β**	**t**	**p**	**Binary r**	**Partial r**	**TV**	**VIF**	**Durbin Watson**
Expert	Stable	2.280	.324	-	7,048	.000**	-	-	-	-	
	Teaching-learning	.131	.108	.133	1,211	.227	.295	.086	.371	2.693	1.735
	Classroom management	.214	.096	.216	2,219	.028*	.317	.155	.474	2.110	
	Guidance	.008	.077	.010	,110	.913	.210	.008	.563	1.777	
	$F_{(3\text{-}203)}$= 8.166	p< .001		R=.331			R^2=.110				
Formal Authority	Independent variable	B	Std. Error	β	t	p	Binary r	Partial r	TV	VIF	Durbin Watson
	Stable	2.629	.360		7.294	.000**					
	Teaching-learning	.195	.120	.183	1.616	.108	.206	.114	.371	2.693	1.960
	Classroom management	.103	.108	.097	.962	.337	.191	.068	.474	2.110	

	Guidance	-.067	.086	-.072	-.786	.433	.099	-.056	.563	1.777	
	$F_{(3-203)}$= 3.418	p< .001		R=.221		R^2= .049					
Personal Model	Independent variable	B	Std. Error	β	t	p	Binary r	Partial r	TV	VIF	Durbin Watson
	Stable	2.102	.346		6.067	.000**					
	Teaching-learning	.274	.116	.256	2.369	.019*	.356	.166	.371	2.693	1.880
	Classroom management	.180	.103	.166	1.738	.084	.335	.122	.474	2.110	
	Guidance	-.028	.082	-.030	-.342	.733	.225	-.024	.563	1.777	
	$F_{(3-203)}$= 10.784	p< .001		R=.374		R^2=.140					
Facilitator	Independent variable	B	Std. Error	B	t	p	Binary r	Partial r	TV	VIF	Durbin Watson
	Stable	2.050	.286		7.157	.000**					
	Teaching-learning	.367	.096	.390	3.832	.000**	.478	.262	.371	2.693	2.028
	Classroom management	.090	.085	.095	1.053	.294	.392	.074	.474	2.110	
	Guidance	.025	.068	.030	.361	.718	.336	.026	.563	1.777	
	$F_{(3-203)}$= 20.260	p< .001		R=.484		R^2= .234					
Delegator	Independent variable	B	Std. Error	β	t	p	Binary r	Partial r	TV	VIF	Durbin Watson
	Stable	3.270	.350		9.334	.000**					
	Teaching-learning	.113	.117	.111	.964	.336	.116	.068	.371	2.693	1.664
	Classroom management	-.056	.104	-.054	-.533	.594	.061	-.038	.474	2.110	
	Guidance	.060	.083	.067	.720	.472	.112	.051	.563	1.777	
	$F_{(3-203)}$=1.157	p< .001		R=.,131		R^2= .017					

**p< .05; **p< .01 significance level*

Regression test gives accurate results only if predicted variables are independent on each other, which means there must not exist a higher level of relationship between the predictor (independent) variables. The shortest way of checking the relationship between predictive variables is through looking at the correlations of these variables among themselves. It can be said multiple correlation exists between the predictor variables that show as high correlations as .60-.80. In this study, the correlation coefficients between the predictor variables were found to vary between .19 and .72 according to Table 10.

Table 10 displays the results of multiple linear regression analyses performed for each of the teaching styles to find out in what way sub-dimensions of pedagogical literacy (Teaching-learning, classroom management, guidance), which are thought to affect pedagogical formation training students' views on teaching styles, can predict students' views in this regard.

"Expert Style" reveals a significant relationship with "Teaching-learning", "Classroom management", and "Guidance" all together (R=.331, R^2=.110). These three sub-variables together explain 11% of the variance in the scores from the teaching style of expert. Looking at the standardized regression coefficients, the predictor variables have a relative descending order of importance on the teaching style of expert as classroom management (β=.216), teaching-learning (β=.133), and guidance (β=.010). According to the regression model elicited from this example, it can be said that of the predictors explaining the variance in the predicted variable, classroom management accounts for the variance at a significant level only [t=2.219, p<.05 (p=.028)]. In other words, only the scores of classroom management have a significant predictive role on the teaching style of expert. The focusing coefficient of classroom management is $B_{focusing}$=.214. It can be suggested that each 1-unit increase in classroom

management skill leads to an increase of .214 units in the students' views regarding the teaching style of expert.

"Formal Authority Style" shows a significant relationship with "Teaching-learning", "Classroom management", and "Guidance" together (R=.221, R^2=.081). All of the three skills seem to account for 4% of the variance in the scores obtained from the teaching style of formal authority. In this case, it can be said that none of the predictors explaining the variance in predicted variable accounts for the variance significantly. The results suggest that pedagogical literacy skills do not bring about significant variances in students' views regarding formal authority as a teaching style.

"Personal Model Style" relates to "Teaching-learning", "Classroom management", and "Guidance" all together at significant level (R=.374, R^2=.140). Three of the sub-variables all together explain 14% of the variance in the scores of personal model Looking at the standardized regression coefficients, the predictor variables have a relative descending order of importance on the teaching style of personal model as teaching-learning (β=.256), classroom management (β=.166), and guidance (β=.030). It can be argued that of the predictors explaining the variance in the predicted variable, teaching-learning accounts for the variance at a significant level only [t=2.369, p<.05 (p=.019)]. To put in another way, only the scores of teaching-learning have a significant predictive role on the teaching style of personal model. The focusing coefficient of teaching-learning skill is $B_{focusing}$=.274. It can be suggested that each 1-unit increase in teaching-learning skill leads to an increase of .274 units in the students' views regarding the teaching style of personal model.

"Facilitator Style" is seen to relate with "Teaching-learning", "Classroom management", and "Guidance" all together at significant level (R=.484, R^2=.2340). Three of the sub-variables all together explain 23% of the variance in the scores of personal model. Looking at the standardized regression coefficients, the predictor variables have a relative descending order of importance on the teaching style of facilitator as teaching-learning (β=.390), classroom management (β=.095), and guidance (β=.030). It can be argued that of the predictors explaining the variance in the predicted variable, teaching-learning accounts for the variance at a significant level only [t=3.832, p<.01 (p=.000)]. In other words, only the scores of teaching-learning have a significant predictive role on the teaching style of facilitator. The focusing coefficient of teaching-learning skill is $B_{focusing}$=.367. It can be suggested that each 1-unit increase in teaching-learning skill leads to an increase of .347 units in the students' views regarding the teaching style of facilitator.

"Delegator Style" seems to relate with "Teaching-learning", "Classroom management", and "Guidance" all together at significant level (R=.131, R^2=.017). Three of the sub-variables all together explain 2% of the variance in the scores of formal authority. So far, none of the predictors that explain the variance in predicted variable seems to account for the variance at a significant level. It can be inferred that pedagogical literacy skills do not lead to significant variance in students' views regarding the teaching style of delegator.

Discussion, Conclusion and Implications

What teaching styles do pedagogical formation training students seem to adopt?

In this study, it was found out that the students who are attending the formation program from different majors seem to adopt the teaching style of facilitator the most among the five teaching styles and formal authority the least. On the other hand, teachers in Turkey prefer expert, authority and facilitating teaching styles quitely high (Evin Gencel, 2013). According to research by Brekelmans, Levy and Rodriguez (1993) and Grasha (2002b), teachers who prefer formal authority are likely to focus more on presenting the content of the course and expect their students to take notes of the concent as it is. They tend to think that their students can gain

more knowledge and skills by listening. When these results are considered, it is seen that the teaching style of formal authority mostly includes traditional and teacher-centered practices. Contrarily, Grasha (2002b) argues that teachers with the dominant teaching style of facilitator, also as found out in the present study, place emphasis on student-centered learning, take into account the needs of students, and assign them curricular and extracurricular responsibilities to ensure their active participation in the lesson. They also organize group activities as needed for active learning. Hence, it can be said that the formation program affects students' views, giving them tendency to adopt a student-centered teaching style. Also, Kaleci (2012), in his study about the dominant teaching style preferred by candidate teachers, found out that the least preferred style is "delegator" at 4.8%, while the most preferred style is "facilitator" as 67.4. Similarly, Üredi (2006) carried out a doctoral thesis on teachers and reported the teaching styles of facilitator/personal model/expert as the most preferential ones.

In the research, the results reached to the teaching styles of pre-service teachers of Pedagogical Formation Education are similar to the results of some studies conducted in the literature. It can be argued that the common aspect of the existing literature is that teachers and pre-service teachers predominantly prefer teaching styles characterized by student-centered teaching. Likewise, we found out that student-centered teaching style is preferred predominantly, and this might be due to the formal program approach currently in effect. The fact that pedagogical formation program students favor student-centered teaching styles over teacher-centered ones, also as underlined in the constructivist learning approach, is quite important for active student participation because such an approach aims to create a learning environment that addresses the individual differences among learners and to meet the needs of the students. The teacher can reach all students only by using different teaching styles in which students are given the central position. On the other hand, Gülten and Özkan (2014) suggested that those who were teachers from non-faculty education showed more traditional teacher behavior. Graduates of the faculty of education are considered to be more advantageous than their peers who are teachers from other sources in terms of having a student-centered understanding with the effect of the pedagogical content program spread over a longer period of time. Based on these findings, it is evaluated that short-term formation education is not sufficient to change the traditional teacher behavior and it will be beneficial for those who are teaching profession to pass the education faculty education. In this context, teaching styles may change at the end of such an educational process.

From the gender perspective, it was found that male participants immoderately prefer teaching styles of formal authority and delegator compared to women. This result was similar to the results of Arpacı (2003) and Kılıç and Dilbaz (2013). Barrett (2004), Lloyd (2002) and Lee (2004) found that female teachers had more collaborative and student-centered styles than male teachers. As for the reference to the status of being paid teachers, students' teaching style preferences did not show a significant difference. Besides, it was observed that the students who have not completed their undergraduate study yet prefer the teaching style of formal authority more widely than those who have completed the undergraduate study before starting the pedagogical formation course. However, it was found that the mean score was low in the guiding teaching style sub-dimension. According to the findings, it can be said that the students of Pedagogical Formation Education will prefer more facilitating teaching style in the teaching process. On the other hand, the low level of guiding teaching style, Pedagogical Formation Education teacher candidates in a positive and supportive way to develop students 'skills in trying to develop, students' ability to act independently, to be able to take initiative and to take responsibility to develop a more collaborative and student-centered class is revealed to be more inadequate.

What level are the pedagogical formation training students' pedagogical literacy skills at?

In this research, besides the teaching styles adopted by the students, their pedagogical literacy skills were determined in order to reveal at what extent these skills can predict the teaching styles. It can be paraphrased that the pedagogical literacy skill sub-variables were used to predict the teaching style applied by the students.

First of all, looking at the students' pedagogical literacy skills, we witness the highest scores in under the sub-variable of teaching-learning. The smallest scores are observed in relation with "guidance". Oğuz (2009) also in his study reported scores quite satisfactory considering ensuring student participation, employing various teaching strategies, and classroom management skill.

As we examine the results against gender, it is seen that female students find themselves heavily better in teaching-learning skills than their male peers. In parallel with this study, İzci (1999) concluded that male teachers' level of professional knowledge of teaching remains low in all areas. Furthermore, this particular result was found high in favor of female teachers in all areas. On the other hand, in the study conducted by Karakuş (2015), it was noted that pedagogical literacy scores of high school teachers did not differ by gender. Back to the present study, we found no significant difference between the pedagogical literacy skills of the students considering their previous experience of teaching as a profession. It is also worth noting that the participants who are currently graduates exhibit considerably higher guidance skills than those who are currently attending their undergraduate study and pedagogical formation program. It may be chiefly attributed to the existence of previous experience of teaching.

Is there a relationship between pedagogical formation training students' views on teaching styles and pedagogical literacy skills?

In search of answer for the question if there is a significant relationship between pedagogical formation students' views on teaching styles, Pearson product-moment correlation analysis was conducted and the factors were found to be positively correlated. In this regard, the highest relationships were found between the teaching styles of facilitator and personal model as well as facilitator and expert; whereas the smallest relationship occurred between facilitator and delegator teaching styles. It can be inferred from the foregoing that students may choose more than one single teaching style. For example, a teacher who adopts personal model as the dominant teaching style has an increasing tendency towards facilitator style at the same time. The point to note here is that student-centered teaching models are supportive of each other. In fact, an upward shift in one of the student-centered teaching styles will push another style in the same "box" in the same direction.

Another finding of the study was obtained from Pearson product-moment correlation analysis conducted to find out whether there is a meaningful relation between pedagogical literacy skills of the students. The correlation analysis yielded a significant positive relationship. When the relationships between sub-dimensions of pedagogical literacy skills are examined, it is noticed that there is a positive relationship between "classroom management", "teaching-learning", and "guidance" on one side and "teaching-learning". The same applies to "guidance" and "classroom management". In other words, a positive change in the teacher's classroom management skills will bring about a positive change in both teaching-learning and guidance skills. This is also likely to affect the activities, actions, practices, and teaching styles of the teacher in the learning environment.

As another sub-goal of the study, it was investigated whether there is a significant relationship between pedagogical literacy skills and teaching styles by means of Pearson product-moment correlation analysis, which revealed significant positive relations. When the relationship between teaching styles and pedagogical literacy is considered, the highest level of significant relationship was found between "teaching-learning" and "facilitator"; whereas the

lowest level of relationship took place between" classroom management" and "formal authority". The teaching style of delegator did not show a significant relationship with any pedagogical literacy subscales. Moreover, there was no significant correlation coefficient value between "guidance" skill and "delegator" or "formal authority" teaching style. According to these results, it can be argued that the tendency of a teacher to choose the teaching style of facilitator may increase as teaching-learning, classroom management, and guidance skills increase.

To what extent do pedagogical formation program students' pedagogical literacy skills predict their views on teaching styles?

In the scope of the fourth sub-problem of the study, the relationship between the pedagogical formation sub-dimensions of the pedagogical formation beneficiaries (teaching-learning, classroom management, guidance) and teaching styles groups was discussed.

It was found out that pedagogical literacy skills do not lead to significant changes in students' views on teaching styles of formal authority or delegator. On the other hand, only classroom management skill seems to be a significant predictor of the teaching style of expert. It can be suggested that one-unit increase in classroom management skills causes an increase of .214 units in the views about the teaching style of expert. In other words, it can be pointed out that a teacher is more likely to prefer the teaching style of expert as her/his classroom management skill increases. As for the personal model teaching style scores, only the teaching-learning skill was found to be a significant predictor. A one-unit increase in teaching-learning skills leads to an increase of .274 units in personal model teaching style scores.

As for the teaching style of facilitator, it was seen to be predicted significantly by the skill of teaching-learning only. A one-unit increase in teaching-learning skills brings a .367-unit increase in the student's views on facilitator teaching style. It can be suggested that a teacher tends to prefer facilitator and personal model as student-centered teaching styles as her/his classroom management skill increases. In the literature, no conclusions have been put forward about this subject.

The fact that no study is available examining the relationship between teachers 'and teacher candidates' opinions about pedagogical literacy skills and their teaching styles in the context of Turkey, proves the need for further research into this topic. In the light of the results from the present study, effectiveness of pedagogical literacy on the teaching styles possessed by teachers seems to stand out as an issue that deserves particular attention. Thus, it is recommended to conduct various studies on this subject.

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