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Developing the “Pedagogical Efficacy Perception Scale” for teacher candidates

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This study aims to develop the “Pedagogical Efficacy Perception Scale” for teacher candidates and to compare scale scores. The sample of this survey model study consists of 310 students studying in a faculty of education. The “Pedagogical Efficacy Perception Scale” developed by the author was used for data collection. Exploratory factor analysis shows that it is a two-factor scale. These factors are “Pedagogical Attitudes” and “Pedagogical Efficacy Perception”. The calculated Pearson correlation coefficients indicate that there are good level correlations between the scores obtained in the sub-scales “Pedagogical Efficacy Perception Scale” and “Pedagogical Attitudes”, and there are high correlations between the scores obtained in the sub-scale “Pedagogical Attitudes” and the total scores and between the scores in the sub-scale “Pedagogical Efficacy Perception” and the total scores. The scores obtained via the measurement tool demonstrate that there is an intergroup difference in sub-dimensions by branch and study period.

Key words: Pedagogy, pedagogical qualification, pedagogical attitude, human training, scale.

INTRODUCTION

Pedagogy is a systematic discipline dealing with human education. It is generally used synonymously with teaching. Pedagogy can be described as a practical discipline which selects teaching methods and techniques appropriate for a particular subject and applies them to class, student, and lesson. It refers to a teaching activity which is teacher or student-centered depending on the qualifications of the implementer and where teacher decides what will be taught to whom as well as how, why, and when it will be taught. Pedagogy involves any action that intends to be influential on the behaviors of individuals, to correct their wrong behaviors, and to make their proper behaviors permanent. It can be said that pedagogy has both a nature of science and a nature of

art (Şişman, 2012). Teacher candidates need to be capable of implementing methods and techniques in full harmony by knowing the requirements and characteristics of this discipline very well.

In the past, the concept of pedagogy was used for referring to knowledge and field of study concerning children. Slaves working as tutors in the Ancient Greece were called pedagogues. Then the bounds of the concept expanded, and it started to involve any educational activity (Böhm, 1982).

It is a fact that pedagogy is both theoretical and practical. Pedagogy searches various elements within the concept of knowledge, focuses on the efforts made for the acquisition of knowledge, and tries to introduce such

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elements and efforts. That points to the practical nature of pedagogy. Practical pedagogy focuses on the realization of the ideas developed on education (Langewald, 1978). No educational case incongruent with pedagogical principles can constitute a basis for future (Schaller and Rainer, 1977). In fact, education can be regarded as a process of pedagogical perception.

Perception refers to impressions or reactions created by external stimuli on sense organs. Organizational perception is based on the relationships between stimuli in the organization and the organizational process. In this sense, such perception types as management perception, justice perception, and perception of neutrality appear in every organization. Organizational perception or management perception reflects the outlook of employees on organization (Akbaba, 2011). The professional success of teacher is possible for using effective teaching techniques and methods. Instruction in a classroom can be interesting by using modern teaching techniques (Başar, 2013). Teacher candidates acquire cognitive, affective, and psychomotor behaviors about child education in the educational process. All of these behaviors constitute the pedagogical perception of a teacher. Efficacy in perception, on the other hand, forms the basis of communication.

Pedagogical efficacy refers to the qualification that is to be held by a person for any action. Efficacy can also be defined as knowledge and skill required to understand the content of any work or task assigned and to fulfill its requirements, or to make analysis or synthesis in any given case. Efficacy perception can be described as grasping the requirements of roles and tasks assigned or undertaken and understanding what is to be done for fulfilling such roles and tasks along with their features. In addition, perception brings about an attitude in person.

Attitude is the instantaneous internal and external reflection of the effect of external stimuli on the personality of an individual. Pedagogical attitude can be defined as making and implementing correct decisions that are suitable for child psychology. In fact, both perception and attitude are the outcomes of education.

Education is the art of stimulating child's spirit, subjecting him/her to our own desire, and establishing trust and attachment (Leif and Rustin, 1980). Educational level is taken as basis in determining the economic progresses and welfare levels of countries (Serin, 1979) and in enjoying rights and freedoms for living humanely (Minibaş, 2005). Rapid scientific developments bring along changes by affecting the social structure, too (Doğan, 1984). Such changes and improvements taking place in the social structure influence education system, as it does every field of the society (Ağaoğlu, 1998). The Ministry of National Education defined the concept of teacher's efficacy and listed the qualifications to be held by efficient teachers as follows: knowledge, skills, and attitudes (MEB, 2008). Teacher's efficacy, what teachers can know and do, teachers' training, and the effects of

teachers on student achievement have become the focus of attention (Ball and Cohen, 1999; Darling-Hammond, 2006; World, 2005).

To be efficient, a teacher needs to have effective communication skills. Among the characteristics of effective communication are treating all students in the class equally, allowing students to express themselves, showing a close interest in students, showing empathy, giving students freedom, providing them with an opportunity to take responsibility, displaying consistent behaviors, and avoiding strict discipline, short temper, and criticism (Fisher and Valdrup, 1999). A good teacher is a person who has necessary knowledge and skills in his/her field, is equipped with professional teaching knowledge, reasons, asks questions, criticizes, is open to improvement and innovations, renews himself/herself continuously, loves his/her profession, adopts serving his/her community and country as the basic principle, has the personality characteristics and sense of responsibility required by his/her profession, and makes good and proper use of Turkish (Tezbaşaran, 2001). The most important criterion is being mentally healthy because a teacher is the member of a human training institution and is expected to solve both his/her problems and the problems of the society s/he lives in (Yapıcı, 2008).

Attitude is defined as an assessment of people and objects, no matter if it is true or not. Attitudes show emotion about something. For example, the saying "I love my job" defines emotion about job (Robbins, 1986, in Kartal, 2009, 225). Attitude is a preliminary effect on behaviors. Accordingly, the attitudes of teacher candidates towards teaching determine their behaviors during teaching (Camadan and Duysak, 2010).

Pedagogical attitude is especially the reflection of emotion that shows up towards conditions in the process of teaching training. Because teachers can affect their students positively or negatively, it is thought that the attitudes of teacher candidates have vital importance. Teacher candidates' attitudes are closely related to why they choose this profession, how they see it, and whether or not there is a teacher in their families (Kartal and Afacan, 2013).

Looking at the literature, we can say that especially in Turkey few studies have been done on pedagogical education (Başar, 2013; Kartal, 2009; Yapıcı, 2008). In the world, various research studies on pedagogical education have been done (Ball and Cohen, 1999; Böhm, 1982; Camadan and Duysak, 2010; Fidell and Tabachnick, 2001; Fisher and Valdrup, 1999; Kanad, 1976; Kline, 2000; Langewald, 1978; Leif and Rustin, 1980; Böhm, 1982; Schaller and Rainer, 1977).

This study aims to develop the Pedagogical Efficacy Perception Scale, to compare (by such variables as sex, branch, and study period) the scores obtained by the final year students of a teacher training school in Eastern part of Turkey in the scale on the basis of the pedagogical courses taken, and to reveal their pedagogical perceptions.

Purpose

The general purpose of the present study is to develop the “Pedagogical Efficacy Perception Scale” for measuring the pedagogical formation levels of teacher candidates, and to compare the scores obtained in the said scale by certain demographic variables. To this end, the present study makes an attempt to answer the following questions:

1. What is the factor structure of the Pedagogical Efficacy Perception Scale?
2. At what level is the internal consistency reliability of the Pedagogical Efficacy Perception Scale?
3. At what levels are the relationships between the total scores obtained by the teacher candidates in the Pedagogical Efficacy Perception Scale and the sub-scale scores?
4. Do the total scores obtained in the Pedagogical Efficacy Perception Scale and the sub-scale scores vary by a) gender, b) branch, and c) class level.

RESEARCH MODEL

This study is a descriptive research with survey model. The sample of this survey model study consists of 310 students studying in faculty of education. The “Pedagogical Efficacy Perception Scale” developed by the author was used for data collection. Exploratory factor analysis shows that it is a two-factor scale. A scale draft was developed by the researchers as data collection tool based on the related literature and experts’ opinions. The opinions of faculty members and teachers concerned with the field were received in regard to the draft scale. The measurement tool was finalized after necessary corrections were made. The measurement tool, which was finalized in terms of content and wording, was presented to domain experts in order to ensure its validity (Balci, 1995).

Population-sample

The sample of this study is the final year students of Yüzüncü Yıl University Faculty of Education. To constitute the research sample, six departments were randomly chosen out of nine departments. The examination of distribution by department showed that 109 people (35.10%) attended the department of primary education; 124 people (40.10%) attended the department of secondary education; 24 people (7.70%) attended the department of computer and instructional technologies containing a small number of students; 15 people (4.80%) attended the department of physical education; 15 people (4.80%) attended the department of arts education; and finally 23 people (7.50%) attended the department of music education. 205 (66.1%) of 310 people included in the sample were males while 105 (33.9%) were females. It is seen that while 205 students attended a 4-year department, 105 students attended a 5-year department.

Data collection tool and data analysis

The “Pedagogical Efficacy Perception Scale”, which was developed by the researcher, was used for data collection. To develop the measurement tool, the related literature was scanned; an item pool was created 70 item tool; and the draft form, which was created by

using the items chosen from this pool, was presented to seven faculty members having at least a doctoral degree in educational sciences to take their opinions about it. These experts examined the tool in terms of language, wording, and content. The tool was finalized based on the recommendations from such experts. 13 item was eliminated from tool according to the recommendation of experts. It is a 5-point Likert-type scale (1: Not at all; 2: Slightly; 3: Moderately; 4: Much; 5: Very much). It composes of 47 items in total. The tool was administered to a sample made up of 310 people after opinions about its content validity were received.

One of the statistical methods used for investigating the validity of a scale is factor analysis. Factor analysis is a multivariate statistics aiming to find (discover) a few number of unrelated and conceptually meaningful new variables by bringing together number of related variables (Büyüköztürk, 2007; Tavşancıl, 2002). In this regard, factor analysis is the act of making data smaller (Özdamar, 2004). Factor analysis has two types: (1) exploratory factor analysis; (2) confirmatory factor analysis. The exploratory factor analysis attempts to explore the structural validity of a measurement tool by investigating the structure of the relationship between items. The confirmatory factor analysis, on the other hand, intends to test the model put forward by the exploratory method based on some criteria and test the model fit (Tabachnick and Fidell, 2001). It is stated that the X^2 statistic used for testing the model fit is not enough by itself, and thus it is suggested to consider such criteria as root mean square error of approximation (RMSEA), comparative fit index (CFI), and goodness of fit index (GFI) altogether (Kline, 2000; Tabachnick and Fidell, 2001; Yıldız and Ergin, 2007). Basically, sampling adequacy is considered important for factor analysis. The sampling adequacy is tested via Kaiser-Meyer-Olkin (KMO) and Bartlett’s test. In addition, determining the loading values concerning items, which is one of the main purposes of factor analysis, demonstrates the meaningfulness of the structures of the relationships between the items included in the measurement tool (Büyüköztürk, 2002; Büyüköztürk, 2007). SPSS was used for making the exploratory factor analysis, determining the Cronbach’s Alpha internal consistency coefficient, and investigating the relationships between some demographic variables and pedagogical efficacy level, while Lisrel was used in the confirmatory factor analysis.

FINDINGS

This section presents the findings obtained in the study in the order of sub-purposes. Table 1 presents the results of the exploratory factor analysis conducted for determining the structural validity of the “Pedagogical Efficacy Perception Scale” and the Cronbach’s Alpha internal consistency coefficients calculated for investigating the reliability of the scale.

Prior to the factor analysis of the “Pedagogical Efficacy Perception Scale” whose results are demonstrated in Table 1, Kaiser-Meyer-Olkin (KMO) value and Bartlett’s Sphericity Test results were examined in order to test the adequacy of the sample size. The KMO value was used as a criterion for deciding whether or not the chosen sample data were adequate for producing factors. A KMO value over 60 means that factor analysis can be continued. However, the higher the ratio is, the better the dataset is for making factor analysis (Kalaycı, 2005). In the present study, the KMO value was found to be .92. That can be considered “very good” (Kalaycı, 2005). The result of the Bartlett’s Sphericity Test, which was con-

Table 1. The exploratory analysis results of the pedagogical efficacy perception scale.

Factor – I Items – pedagogical attitudes	Rotated factor loading value	Corrected item-total correlation
23. Believing in the benefits of receiving support from parents for succeeding in education.	.70	.72
47. Believing in the necessity of arranging classroom in accordance with “Constructivist Education”.	.67	.69
20. Believing in the importance of collaborative education.	.65	.66
36. Believing in the importance of making a plan and preparation before the lesson.	.65	.66
13. Believing that a democratic classroom climate may facilitate learning in the educational process.	.63	.67
5. Considering it necessary to use tools and materials for an effective education.	.63	.64
33. Agreeing with the statement, “Education starts with knowing an individual”.	.62	.65
10. Believing in the importance of constructivist education.	.62	.63
37. Believing in the benefits of social activities for education.	.61	.65
42. Believing in the effect of physiological environment on education.	.61	.65
43. Agreeing with the idea that fear and anxiety reduce learning.	.59	.61
11. Believing in the necessity of educational techniques rather than punishment for preventing undesirable behaviors.	.58	.62
14. Believing in the necessity of establishing a special communication network whereby parents may put forward their expectations and suggestions concerning the school.	.57	.59
25. Believing in the benefits of educational activities in the classroom.	.57	.63
12. Believing in the importance of knowledge sharing for achieving effectiveness.	.57	.61
26. Cooperating with the neighboring educational institutions for improving student achievement.	.53	.62
32. Knowing that study trips for educational purposes (environment, museum, factory, etc.) must be organized through receiving written permission from parents.	.51	.54
The Variance Explained by the 1 st Factor= 19.63%		
Cronbach's Alpha for the 1 st Factor= .91		

ducted for the same purpose, was found to be meaningful [$\chi^2 = 4718.44$, $sd=666$, $p<.0001$]. In accordance with these findings, it was decided that the dataset was adequate for factor analysis (Kalaycı, 2005; Şencan, 2005).

The exploratory factor analysis showed that the scale had a two-factor structure. 10 out of 47 items included in the draft form were removed from the measurement tool because they did not serve the purpose of measuring the intended characteristic due to their low factor loadings. The remaining 37 items had ideal factor loading values and item-total correlations. At the end of the investigations conducted, the first factor was named as “Pedagogical Attitudes”. This factor contained 17 items. The factor loading values of the items rotated via Varimax method varied between 0.51 and 0.70. The item-total correlations of the items included in this dimension varied between 0.54 and 0.72. The variance explained by the said factor alone was 19.63 while its Cronbach's alpha internal consistency coefficient was 0.91. The highest score to be obtained in this sub-dimension was 85, while the lowest one was 17. 51, which was the average of the highest score and the lowest score to be obtained in the scale was taken as the threshold value. The “Pedagogical Attitude” levels of the teacher candidates

obtaining scores below 51 were deemed low, while those of the teacher candidates obtaining scores above 51 were deemed high.

The second factor was named as “Pedagogical Efficacy Perception”. This factor contained 20 items. The factor loading values of the items rotated via Varimax method varied between 0.49 and 0.68. The item-total correlations of the items included in this dimension varied between 0.50 and 0.70. The variance explained by the said factor alone was 19.10, while its Cronbach's alpha internal consistency coefficient was 0.90. Even though the variance explained by both factors was somewhat low (38.74%), Cronbach's alpha coefficient regarding the entire scale was 0.93. The highest score to be obtained in the sub-scale “Pedagogical Efficacy Perception” was 100, while the lowest one was 20. 60, which was the average of the highest score and the lowest score to be obtained was taken as the threshold value for the sub-scale Pedagogical Efficacy Perception. Since the scale contained 37 items in total, the highest score to be obtained in the scale would be 185, and the lowest score to be obtained would be 37. The threshold value for the entire scale was found to be 111 [(185 + 37)/2 = 111].

According to the research findings, the “Pedagogical Efficacy Perception Scale” is a valid and reliable tool that

Table 1. Contd.

Factor – II Items – pedagogical efficacy perception	Rotated factor loading value	Corrected item-total correlation
16. Feeling o efficient in terms of the affective development of students.	.68	.70
45. Feeling efficient in terms of training those students who have learning difficulties.	.66	.63
35. Believing that one will use motivational techniques properly for achieving an effective education.	.62	.70
44. Knowing how to form level groups and classes and how to provide appropriate education for each.	.61	.64
4. Believing that one will implement the methods and techniques employed in education.	.60	.64
8. Believing that one will apply the lesson plan properly.	.60	.60
46. Feeling efficient in terms of training students who are in need of special education.	.58	.54
29. Believing that one will perform a proper assessment and evaluation.	.56	.63
17. Believing that one will manage time effectively for improving the quality of education.	.56	.60
7. Believing that one will be able to make an appropriate lesson plan.	.56	.55
39. Feeling efficient in terms of maintaining arbitrary discipline.	.55	.58
6. Believing that one has learned the motivational techniques employed for achieving a successful education.	.54	.59
38. Knowing the basic psychological principles of education.	.54	.59
2. Believing that one will apply the basic principles of education.	.54	.60
28. Perceiving oneself as an instructional leader.	.54	.55
34. Capability to make an environmental review.	.52	.57
40. Knowing the developmental characteristics of children.	.52	.62
22. Feeling efficient in terms of knowing the primary education legislation.	.50	.50
3. Knowing the methods and techniques employed in education.	.50	.55
30. Believing in the effect of your knowledge power on managing the classroom.	.49	.55

The variance explained by the 1st Factor= 19.10%; Cronbach's Alpha for the 2nd factor= .90; Total Variance Explained= 38.74%; Cronbach's Alpha for the Entire Scale= .93.

can be used among teacher candidates.

The third sub-purpose of the study was to investigate the relationships between the total scores obtained by the teacher candidates in the "Pedagogical Efficacy Scale" and the sub-scale scores. Based on the calculated Pearson correlation coefficients, it was seen that there were good level correlations [$r=.578$; $p<.01$] between the scores in the sub-scales "Pedagogical Efficacy Perception" and "Pedagogical Attitudes", high correlations between the scores in the sub-scale "Pedagogical Attitudes" and the total scores [$r=.88$; $p<.01$], and again high correlations between the scores in the sub-scale "Pedagogical Efficacy Perception" and the total scores [$r=.90$; $p<.01$].

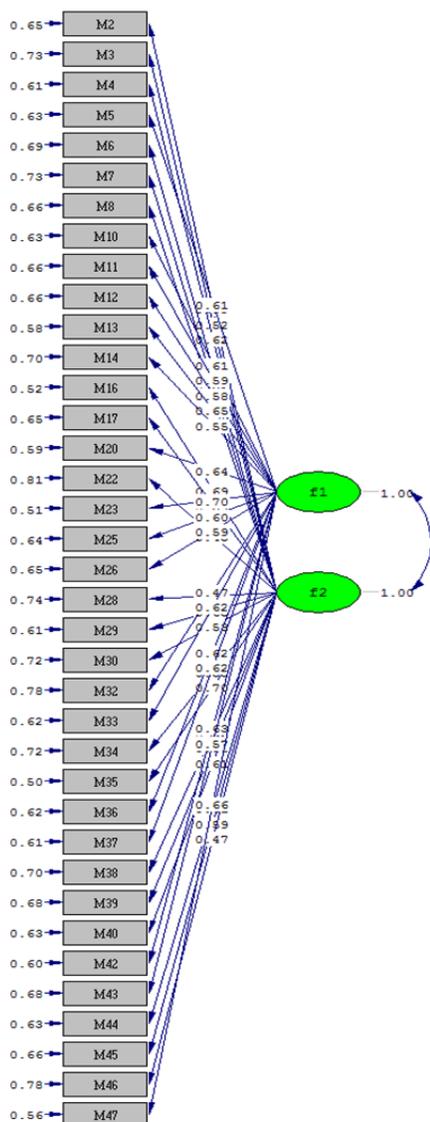
In the scale development process, the structure demonstrated by the exploratory factor analysis was tested via the confirmatory factor analysis. The model fit was tested through the criteria RMSEA (Root Mean Square Error Approximation), CFI (Comparative Fit Index), and GFI (Goodness of Fit Index). It was thought that the said criteria could be ideal for testing the model.

The analysis indicated that the RMSEA value concerning the model fit was 0.062. The closer the RMSEA value is to zero, the fitter the model is (Fidell and Tabachnick, 2001; Browne and Cudeck, 1993). According to the analysis results, the CFI value was 0.96, and the GFI value was 0.91. For a good model, the CFI and GFI values need to come close to 1. The RMSEA, CFI, and GFI values obtained in the study were at good levels. In consideration of all criteria, the two-factor structure was found to have a good model according to the results of the confirmatory factor analysis. When the latent variable tried to be predicted via the confirmatory factor analysis was treated as a dependent variable in a two-factor structure and the scale items trying to explain the latent variable were deemed independent variables, the path diagram related to the model turned out to be as in Figure 1.

Figure 1 presents the amounts of effect of each item on the latent dependent variable as well as relevant correlation coefficients. It was observed that the correlation coefficients concerning the items varied between .50 and

Table 2. The comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by sex.

Scores	Sex	N	\bar{X}	S	sd	t	P
Pedagogical Attitudes	1. Female	105	71.71	12.04	308	-.157	.875
	2. Male	205	71.93	11.22			
Pedagogical Efficacy Perception	1. Female	105	73.30	11.75	308	.931	.352
	2. Male	205	72.13	9.65			
General Total	1. Female	111	145.00	21.23	308	.405	.686



Chi-Square=1367.57, df=628, P-value=0.00000, RMSEA=0.062

Figure 1. Findings concerning the exploratory factor analysis.

.81. As the good fit criteria demonstrated by the confirmatory factor analysis (RMSEA, CFI, GFI) had ideal

values, it can be argued that the structure put forward by the exploratory factor analysis was valid.

The fourth sub-problem of the study was to determine whether or not the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Scale” varied significantly by gender, branch, and study period. Table 2 presents the results of the t-test for two independent samples regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by sex.

The examination of the results of the t-test for two independent samples regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by sex showed that there was no significant difference between groups in terms of the scores obtained in the entire scale and the sub-scale scores ($t_{(308)} = -0.157, p > 0.05$; $t_{(308)} = 0.931, p > 0.05$; $t_{(308)} = 0.405, p > 0.05$). The female students obtained higher scores than the male students, but the difference was very small. It is remarkable that both the female and the male teacher candidates obtained a high score in the sub-scale Pedagogical Attitudes (threshold value for the sub-scale Pedagogical Attitudes=51). It was seen that both the female and the male students obtained scores above the average in the sub-scale Pedagogical Efficacy Perception Scale (threshold value for the sub-scale Pedagogical Efficacy Perception=60). However, it is noteworthy that the Pedagogical Attitudes scores of the teacher candidates were higher than their scores in the sub-scale Pedagogical Efficacy Perception. That may point to that some characteristics accepted in theory may not correspond to the same characteristics in practice. As is seen in Table 2, while the attitude averages of the female and the male students in the 17-item sub-dimension of Pedagogical Attitudes were 71.71 and 71.93 respectively, their attitude averages in the 20-item sub-scale of Pedagogical Efficacy Perception were found to be 73.30 and 72.13 respectively. However, when the number of items was considered, it was expected for the scores obtained in the sub-scale of Pedagogical Efficacy Perception to be higher. Overall the distribution of students by gender reflects the sample of this study.

Table 3. The comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Attitudes and Efficacy Perception Scale” by branch.

Scores	Department name	N	Mean rank	χ^2	sd	P
Pedagogical Attitudes	1.Primary Education	109	159.25	4.61	.33	4
	2.Secondary Education	124	155.25			
	3.Fine Arts	38	141.83			
	4.Computer and Instructional Technologies Education	24	180.25			
	5.Physical Education	15	125.37			
Pedagogical Efficacy Perception	1.Primary Education	109	155.04	3.83	.43	4
	2.Secondary Education	124	146.11			
	3.Fine Arts	38	168.30			
	4.Computer and Instructional Technologies Education	24	173.60			
	5.Physical Education	15	175.03			
General Total	1.Primary Education	109	157.03	2.23	.69	4
	2.Secondary Education	124	149.62			
	3.Fine Arts	38	156.58			
	4.Computer and Instructional Technologies Education	24	178.98			
	5.Physical Education	15	152.63			

Based on the distribution of the students included in the sample by their departments, it was decided to categorize individuals, in general, as follows: “Primary Education”, “Secondary Education”, “Fine Arts”, “Computer and Instructional Technologies Education”, and “Physical Education”. The attitudes and efficacy perceptions of the students were compared by departments. The scores obtained in the scale verified the normal distribution assumption ($p > 0.05$). However, non-parametric Kruskal Wallis H Test was preferred as individuals did not have a balanced distribution among departments. Table 3 firstly presents the results of the Kruskal-Wallis H Test regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Attitudes and Efficacy Perception Scale” by branch.

According to the results of the Kruskal-Wallis H Test regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by branch, there was no significant difference between the groups in the sub-scales “Pedagogical Attitudes” [$\chi^2_{(4)} = 4.61, p > .05$] and “Pedagogical Efficacy Perception” [$\chi^2_{(4)} = 3.83, p > .05$] or in terms of the total scores [$\chi^2_{(4)} = 2.23, p > .05$].

Another purpose of the study was to investigate the relationship between study period and the scores obtained in the Pedagogical Efficacy Scale. The relationships between study period and the scores obtained in

the entire scale and the sub-scale scores were investigated. Table 4 presents the results of the t-test for two independent samples regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by study period.

According to the results of the t-test for two independent samples regarding the comparison of the sub-scale scores and the total score obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by study period, there was a significant intergroup difference only in the scores obtained in the sub-scale “Pedagogical Attitudes” [$t_{(308)} = -1.82, p < .05$]. The examination of the averages of the groups demonstrated that the average of the students with a 4-year study period ($\bar{X} = 71.75$) was lower than that of the students with a 5-year study period ($\bar{X} = 74.03$). There was no significant intergroup difference in the total scores obtained in the scale and the scores obtained in the sub-scale Pedagogical Efficacy Perception by the study period ($p > 0.05$).

It is not found any similar research to this particular study. For that reason it is not presented any research findings.

CONCLUSION AND IMPLICATIONS

In the present study, a tool capable of measuring the

Table 4. The comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by study period.

Scores	Study period	N	\bar{X}	S	sd	T	P
Pedagogical Attitudes	1. Four-Year	205	71.75	11.10	308	-1.82	.05
	2. Five-Year	105	74.03	8.75			
Pedagogical Efficacy Perception	1. Four-Year	205	72.58	10.95	308	1.550	.122
	2. Five-Year	105	70.44	12.40			
General Total	1. Four-Year	205	144.33	19.89	308	-.06	.952
	2. Five-Year	105	144.47	18.67			

pedagogical efficacy perceptions of teacher candidates was developed. The review of the related literature showed that there was no study similar to the present study. Thus, it was thought that the present study would contribute to the literature. The exploratory factor analysis showed that the scale had a two-factor structure. Based on the findings, it can be seen that the “Pedagogical Efficacy Scale” is a valid and reliable tool that can be used among teacher candidates. The structure put forward by the exploratory factor analysis was tested through the confirmatory factor analysis. The examination of the fit criteria (RMSEA, CFI, and GFI) showed that the model could be represented in two dimensions. The suitability of the inclusion of the items making up the measurement tool in relevant sub-dimensions was verified through correlation values, too. In consideration of the foregoing, it can be argued that the measurement tool served its purposes reliably within the scope of two sub-dimensions.

The present study also made an attempt to investigate the relationships between the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” and relevant sub-scale scores. The Pearson correlation coefficients indicated that there were good level correlations between the scores in the sub-scales “Pedagogical Efficacy Perception” and “Pedagogical Attitudes”, high correlations between the scores in the sub-scale “Pedagogical Attitudes” and the total scores, and high correlations between the scores in the sub-scale “Pedagogical Efficacy Perception” and the total scores. It was also determined that there was an intergroup difference in the above-mentioned sub-dimensions by branch and study period.

The examination of the results of the t-test for two independent samples regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by sex showed that there was no significant difference between groups in terms of the scores obtained in the entire scale and the sub-scale scores. The results of the Kruskal-Wallis H Test regarding the comparison of the sub-scale scores and the total scores

obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by branch showed that there was no significant difference between the groups in the sub-scales “Pedagogical Attitudes” and “Pedagogical Efficacy Perception” or in the total scores. The results of the t-test for two independent samples regarding the comparison of the sub-scale scores and the total scores obtained by the teacher candidates in the “Pedagogical Efficacy Perception Scale” by study period indicated that there was a significant intergroup difference only in the scores obtained in the sub-scale “Pedagogical Attitudes”.

Since the attitudes and behaviors of individuals may change in the course of time, it should always be remembered that any scale developed or adapted may not have a long-term valid and reliable structure. Thus, it is suggested to conduct the structural validity and reliability analyses of the developed Pedagogical Efficacy Perception Scale through different sample groups in the course of time.

Research findings may be guiding for education administrators, education faculty administrations, and lecturers in making and implementing programs. Moreover, it may be used in measuring success in different faculties and allow training of teacher candidates better.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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