

Examination of the Relationship between Individual Innovativeness Levels and Professional Innovativeness Tendencies of Primary School Teacher Candidates

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ABSTRACT

The aim of this study is to examine the level of individual innovation and the professional innovativeness tendencies of the primary school teacher candidates. Scanning model was used in the research. The population of the study consists of 192 primary school teacher candidates studying in the faculty of education. Kılıçer and Odabaşı's (2010) Turkish adaptation of "Individual Innovativeness Scale" and "Professional Innovativeness Tendencies Scale" developed by Yılmaz, Soğukçeşme, Ayhan, Tuncay, Sancar ve Deniz (2014) and personal data form is used as a data collection tool. The mean points of individual innovation of teacher candidates is found at low levels. While the individual innovation points of the primary school teacher candidates differ according to the level of the father education, it is found that the professional innovation tendencies differ according to the grade level. It was concluded that there was a moderate, positive and significant relationship between the individual innovation points of the primary school teacher candidates and the professional innovativeness tendencies. In this respect, the participation of primary school teacher candidates should be encouraged for scientific activities such as conferences, seminars and workshops on topics such as innovation, creativity, problem solving and critical thinking.

Keywords: *Primary school teacher candidate, individual innovation, professional innovation tendency*

INTRODUCTION

In the history of mankind, there have been many inventions, discoveries and inventions that changed the world with a sense of curiosity, imagination and a desire to explore the world. In these developments affecting all areas of life, there have been some changes in the needs of time. For example, the manufacture of a mobile phone after the invention of the telephone indicates the change of the invention over time due to the needs of that time. At this point, the concept of innovation emerges.

Derived from the Latin word "innovates", the word "innovation" in English is expressed in Turkish with the concept of innovation (Kılıçer, 2011). Using the concept of innovation for the first time, Joseph Schumpeter adopted innovation as the driving force of development (Schumpeter, 2010). In the field, it is observed that the term innovation has many meanings and definitions. Innovation according to some of these definitions; refer to the creative process in which new things, ideas and practices are developed; the new thing can mean the idea or practice itself, or define the process in which the person adopting an existing innovation becomes part of his cognitive status and behavioral repertoire (Zaltman, Duncan & Holbek, 1973). Rogers (2003) defines innovation as the idea that is perceived as new by the individual, as an application or

object, and as a process through which an innovation passes through a social system. The reason why innovation has many meanings is that this concept has emerged in many different fields of study and social theories (Goldsmith & Foxall, 2003).

According to Evans (1967), innovation in the context of educational research is defined by dividing into two sub-components: In the first component, there is an idea or element that comes to a certain individual or group, and in the second component there is a change resulting from the adoption of the object or idea. Kılıçer (2011), considering the educational institutions indicated that innovation can be expressed as applications that would add positive values to the institutions' administrative, physical, technological fields, generate added value of providing education services for the public and practices that enable education system to be more efficient, contributory, and economic. Innovative schools allow teachers to access resources more easily and build community strong relationships (Pollock, 2008). Kan (2009) emphasized the importance of innovation for educational institutions by stating that non-renewable and non-changeable educational institutions may be affected by the negative consequences of change.

In summary the term innovation is equivalent of innovation when referred as result and innovativeness when referred as process (Sungur, Koç & Dulupçu, 2014). Innovativeness in literature is handled in two different ways: individual and institutional (Öztürk-Yurtseven & Aldan-Karademir, 2017). Goldsmith & Foxall (2003) stated that individual innovation is related to the individual's willingness to try new things, to take risks and to be open to experience in terms of personality traits. Yuan and Woodman (2010) describe individual innovation as developing, adopting and practicing innovation in one's life. Rogers (2003) divided individuals into five categories according to their adoption of innovation: Innovators, early adopters, early majority, late majority and laggards.

Innovators are people who are actively pursuing innovations and are highly exposed to mass media and large interpersonal networks and are among the first to adopt innovations (Rogers, 2003). Innovators are entrepreneurs who identify and investigate new boundaries (Jacobsen, 1997). Since new things are often expensive when first placed on the market, individuals in this category are wealthier than individuals in other categories (Beal & Bohlen, 1956). Individuals in the early adopters category are more likely to be opinion leaders than individuals in other categories (Rogers, 2003). These opinion leaders are not among the first to adopt innovation (Greenhalgh, Robert & Bate, 2008). Innovators can serve as a source of information for opinion leaders (early adopters) (Dearing, 2008). Early adopters have a higher level of social status and education than individuals in the following categories. They have a reasonable approach to risk. Individuals in the category of early majority adopt an innovation after a while. Because they are not very willing to take risks, they have a wait-and-see approach and as a result, their adoption period takes longer than the early adopters (Greenhalgh, Robert & Bate, 2008). Early majority who have a social status above the average rarely take on opinion leadership positions (Rogers 2003). Late majority act cautiously against innovations and wait for most people to adopt innovation (Jacobsen, 1997). They do not want to be left out when they see innovation worthy of adoption. Moreover, the pressures made by the members who adopt the innovation lead the late majority to adopt innovation (Rogers, 2003). The innovation decision-making process of traditionalists who want to make sure that the idea will not fail before the adoption of a new idea takes a long time (Jacobsen, 1997). Therefore, individuals in this category are the last ones to adopt an innovation (Rogers, 2003). These individuals interact with those with relatively traditional values (Jacobsen, 1997).

When new ideas are invented, spread, accepted, or rejected, social change takes place (Rogers, 2003). It is also important that teachers who play an important role in social change and who have a responsibility should also adopt innovativeness. Because innovativeness is one of the important features teachers should have for a new future (Yılmaz, Soğukçeşme, Ayhan, Tuncay, Sancar & Deniz, 2014). Innovative teachers need a development and improvement by believing in lifelong learning for themselves and their students (Watt, 2002).

In the 21st century, innovation skills are becoming increasingly important in identifying students who are prepared for a more complex life and work environment than who are not (Sardone & Devlin-Scherer, 2010). Creativity and innovation skills field, which is among 21st century skill areas, includes idea creation techniques, creation, communication, application of new ideas and self-evaluation as continuous learning

opportunity (Trilling, Fadel & Partnership for 21st-Century Skills, 2009). In order to gain the necessary competencies to students for this skill area, the teacher must be an innovative individual in order to be able to assume the duties of the teacher.

Researchers may want to measure innovation for different purposes (Goldsmith & Foxall, 2003). For example, researchers may try to determine the impact of innovativeness on information acquisition or decision making (Klink & Smith, 2001). When the literature is inspected studies are found high inspected the relationship between individual innovativeness with individual creativity (Yenice & Yavaşoğlu, 2018), lifelong learning tendency (Kılıç & Ayvaz Tuncel, 2014; Yılmaz & Beşkaya, 2018; Öztürk-Yurtseven & Aldan-Karademir, 2017), teaching approach (Uçuş & Acar, 2018), admission to teaching technologies (Akgün, 2017), problem solving skill (Şahin-İzmirli & Gürbüz, 2017), readiness to change and perceived organizational support (Kayasandık, 2017), web pedagogical content knowledge (Gökçearslan, Karademir & Korucu, 2017), professionalism (Parlar & Cansoy, 2017), ICT knowledge (Noh, Hamzah & Abdullah, 2016), attitudes towards European Union Lifelong Learning Projects (Demircioğlu, Yavuz-Konokman & Akay, 2016), readiness to learn online (Demiralay, Bayır & Gelibolu, 2016), e-learning (Özcan, Gökçearslan & Solmaz, 2016; Loogma, Kruusvall & Ümarik, 2012), techno-pedagogical training competence (Argon, İsmetoğlu & Çelik-Yılmaz, 2015; Çuhadar, Bülbül & Ilgaz, 2013), level of technology attitudes (Örün, Orhan, Dönmez & Kurt, 2015), attitude towards learning (Adıgüzel, Kaya, Balay & Göçen, 2014), teacher leadership (Akın-Kösterelioğlu & Demir, 2014), reflective thinking tendency (Önen & Koçak, 2014), individualism/collectivism (Okтуğ & Özden, 2013), the tendency to think critically (Özgür, 2013), self-efficacy (Çelik, 2013) and ability to acquire knowledge (Bitkin, 2012). In addition to these studies, the academic achievement and satisfaction of the students who have different individual innovation features in the introduction to programming which is designed with web based mixed learning method has been the subject of research (Yağcı, 2018). In the literature, it was concluded that there is no study examining the relationship between the level of individual innovativeness and the tendencies of professional innovativeness.

The resistance of the teachers, which are among the most important elements of the system towards innovation, affects the correct and efficient application of the changes in the field of education and the efficiency of the educational performance (Altıntaş-Yüksel & Gelişli, 2018; Tabak, Erkuş & Meydan, 2010). For this reason, it is important to provide teachers and pre-service teachers with an understanding of professional innovativeness and to provide the necessary environments for the teachers to realize the concepts of professional innovativeness (Göktaş & Yetim, 2004). In addition to this, it is also important to determine the innovativeness characteristics of the teachers who play an important role in the preparation of the students for the future, and the tendencies of professional innovation. In this direction, the aim of this study was to examine the individual innovation levels of primary school teacher candidates and their professional innovativeness tendencies. For this purpose, the following research questions were sought:

1. What are the innovativeness levels of primary school teacher candidates?
2. What is the distribution of primary school teacher candidates according to innovativeness categories?
3. Does the level of innovativeness of primary school teacher candidates vary according to gender, grade level, achievement point average, mothers' and fathers' education level?
4. What is the professional innovativeness tendencies' level of the primary school teacher candidates?
5. Are professional innovativeness tendencies of primary school teachers differentiated according to gender, grade level, achievement point average, mothers' and fathers' education level?
6. Is there a relationship between the level of individual innovativeness and the professional innovativeness tendencies of primary school teacher candidates?

RESEARCH METHOD

Research Model

In this research, scanning model was used because it was aimed to determine the level of individual innovativeness and the tendencies of professional innovativeness of primary school teacher candidates. Scanning studies are aimed at collecting data to determine the characteristics of a group (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2014).

Participants

The population of the study consisted of primary school teacher candidates studying at Faculty of Education. The distribution of primary school teacher candidates according to gender and grade levels is presented in Table 1.

Table 1. Distribution of primary school teacher candidates in the sample of the study by gender and class levels

Variable		Class				Total	
		1	2	3	4	F	%
Gender	Female	34	42	38	34	148	77.1
	Male	12	6	15	11	44	22.9
Total		46	48	53	45	192	100

The sample of the study determined by a random sampling method consisted of 192 teacher candidate volunteers studying Sakarya University Faculty of Education. 77.1% of the students were female and 22.9% were male.

Data Collection Tool

“Individual Innovation Scale” adapted to Turkish by Kılıçer and Odabaşı (2010) was used. The reliability coefficient of the 20-item scale was found to be .82. According to the points calculated on the scale, individuals can be categorized in terms of innovativeness. In the calculation of individual innovativeness point, $42 + (\text{positive item total point} - \text{negative item total point})$ formula was used. According to the point calculated with the help of the scale, the level of innovativeness of individuals can be evaluated in general. According to this, if the total point is 80 points above, it can be categorized as an innovative, an early adopter between 69 and 80 points, an early majority between 57 and 68 points, a late majority between 46 and 56 points and a traditionalist under 46 points. Moreover, if the total point is above 68 points, it can be considered as highly innovative, between 68 and 64 as medium-level innovative and 64 and lower as low-level innovative.

“Professional Innovativeness Tendencies Scale” developed by Yılmaz, Soğukçeşme, Ayhan, Tuncay, Sancar and Deniz (2014) was used. After the validity and reliability studies, researchers were found that the scale consisted of 25 items and one factor and the internal consistency coefficient was .91. The scale is rated as 5-point Likert in the form of “I completely agree, I agree very much, I agree moderately, I agree little, I don't agree at all”.

Personal information form was used to determine the gender, grade level, general academic grade point and the level of education of the parents. There are a total of 5 questions about the variables determined by making a field type scan in the form.

Collection of Data

The data were collected by the researcher in four sessions according to primary school teacher candidates' grade levels. It took approximately 30 minutes to complete the scales and form.

Data Analysis

Independent samples T-Test and One-Way Anova analyzes were used as the distribution of the data

was determined to be normal as a result of the normality test. Kruskal Wallis-H Test was used as nonparametric tests since the average number of individuals between 0-1.99 was less than 15 in average achievement point. Tukey Test was used to determine the difference between the groups.

FINDINGS

The findings are given in the order of sub-problems. In this context, firstly, findings about the level of individual innovativeness of primary school teacher candidates were included. In this direction, the findings related to the level of individual innovativeness of the class teacher candidates related to the first sub problem of the study are shown in Table 2.

Table 2. Descriptive statistics on the innovativeness levels of primary school teacher candidates

Category	F	%	Mean	sd
Highly innovative	29	15.1	74.04	6.07
Medium-level innovative	37	19.3	65.87	1.48
Low-level innovative	129	65.6	56.71	4.8
Total	192	100	61.09	7.97

As seen in Table 2, when the innovativeness points of the primary school teacher candidates are considered, 15.1% is highly innovative, 65.6% is low level innovative and 19.3% is medium level innovative. In general, it is seen that the average point of the primary school teacher candidates ($\bar{x}=61.09$) is lower than 64 points, which is considered to be low level. In this context, it is seen that two thirds of the primary school teacher candidates are at medium and low levels in terms of innovativeness and one third is at a high level in terms of innovativeness. Table 3 shows the distribution of the primary school teacher candidates according to the individual innovativeness categories related to the second sub-problem of the study.

Table 3. Distribution of primary school teacher candidates by individual innovativeness categories

Category	F	%
Innovators	3	1.6
Early adopters	26	13.5
Early majority	110	57.3
Late majority	49	25.5
Laggards	4	2.1
Total	192	100

When Table 3 is examined, it is seen that 57.3% of the primary school teacher candidates are in the category of innovators and 25.5% are included in the categories of late majority. The category in which the primary school teacher candidates are mostly included is the category of early majority. Among the most prominent features of the individuals in this category is they prefer to see whether innovation works on innovators. This can be interpreted as the fact that the primary school teacher candidates in this category may need clear evidence of the benefits of innovation to adopt innovations.

Second category where the primary school teacher candidates are most involved is the "late majority". Among the most important characteristics of the individuals in this category is the fact that it waits until the majority adopts the innovation. This may be interpreted as the fact that primary school teacher candidates in this category may stuck behind society in adopting innovations.

Third category where the primary school teacher candidates are most involved is "early adopters". The most important feature of the individuals in this category is that they are opinion leaders. They can serve as a role model among colleagues who are not far ahead of the average individuals in innovativeness. In addition, pioneer primary school teacher candidates can look at innovators for new ideas and see how these new ideas emerge.

Fourth category where the primary school teacher candidates are most involved is "laggards".

Individuals in this category generally have the highest resistance to a new idea. In this context, although it is a positive situation that a few of the teacher candidates in the class are in the laggards category, it is a pity and thought provoking that there are primary school teacher candidates who are suspicious of innovation, do not like to take risks, and are not open to innovation and change.

The least involved category among the primary school teacher candidates is “innovators”. Individuals in this category are the first to test a new product in general. In this context, primary school teacher candidates in the “innovators” category are expected to tend to socialize with other innovators. The low number of primary school teacher candidates in this category means that the number of people who adopt new and innovative products is low. Rogers (2003) argues that the adoption of a new idea derives from the exchange of information through interpersonal networks. The extension of innovation also involves the process of adopting a particular element in time by individuals affiliated with the social system (Katz, Levin & Hamilton, 1963). In this context, it is envisaged that a few of the primary school teacher candidates take place in the innovative category may cause a negative impact on the dissemination of innovations related to their profession.

Rogers (2003) presents the percentage represented by each of the masses described above in a population in the Adoption/Innovation Curve. According to this curve, 16% of the population is laggards, 34% is late majority, 34% is early majority, 13.5% is early adopter and 2.5% is innovators. When this curve is inspected it can be said that there are less innovators among primary school teacher candidates compared to individuals in the society but more early majority. Besides, it can be seen that there are more laggards and late majority among the individuals who make up the society compared to the primary school teacher candidates. The proportion of early adopters found in a society was represented at the same rate as the early adopters among the primary school teacher candidates. The findings of the third sub-problem related to the primary school teacher candidates individual innovativeness level according to gender, grade level, general academic grade point average, parental education level variables are presented in Table 4, 5, 6, 7, 8 and 9.

Table 4. Independent group T-Test results to determine whether the individual innovativeness points of the primary school teacher candidates differ according to gender

Points	Groups	N	Mean	sd	T-Test		
					t	df	p
Individual Innovativeness	Female	148	72.76	8.99	.83	59.38	.41
	Male	44	71.21	11.53			

It was found that there was no statistically significant difference ($p > .05$) among the primary school teacher candidates' individual innovativeness points according to gender. This finding can be interpreted as gender is not effective in determining the level of individual innovativeness of primary school teacher candidates.

Table 5. The results of One-Way ANOVA to determine whether the individual innovativeness points of the primary school teacher candidates differ according to the grade level

Point	N, Mean and sd Values				ANOVA Results					
	Groups	N	Mean	sd	Sum of Squares	df	Mean Square	F	p	
Individual Innovativeness	1	46	60.3	7.02	Between G.	437.79	3	145.93	2.35	.07
	2	48	59.21	7.01	Inside G.	11678.52	188	62.12		
	3	53	61.59	6.98	Total	12116.31	191			
	4	45	63.33	10.25						

According to the primary school teacher candidates' grade levels that they have been studying, it was found that their individual innovativeness points were not statistically significant difference ($p > .05$). This finding can be interpreted as the class level has no effect on designating the primary school teacher candidates' individual innovativeness levels.

Table 6. The results of the Kruskal Wallis-H Test which has been applied in order to designate whether primary school teacher candidates' individual innovativeness points show any difference according to their achievement point average or not

Point	Groups	N	Mean Rank	χ^2	df	p
Individual Innovativeness	3.00-4.00	105	92.44	1.7	2	.43
	2.00-2.99	81	101.61			
	0.00-1.99	5	79.90			

It was found that there was no statistically significance difference ($p > .05$) between primary school teacher candidates' achievement point average and their individual innovativeness points. This finding can be interpreted as GPA has no effect on designating the individual innovativeness of the primary school teacher candidates.

Table 7. The results of the One Way ANOVA which has been applied in order to designate whether primary school teacher candidates' individual innovativeness points show any difference according to their mothers' education levels or not

N, Mean and sd Values					ANOVA Results					
Point	Groups	N	Mean	sd		Sum of Squares	df	Mean Square	F	p
Individual Innovativeness	Without a diploma	19	59.95	9.81	Between G.	131.30	3	43.77	.69	.56
	Primary school	119	61.38	8.19	Inside G.	11985.01	188	63.75		
	Middle school	20	59.15	7.93	Total	12116.31	191			
	High school/university	34	61.88	5.88						

It was found that there was no statistically significance difference ($p > .05$) between primary school teacher candidates' mothers' education levels and their individual innovativeness. This finding can be interpreted as education levels of the mothers have no effect on designating the primary school teacher candidates' individual innovativeness points.

Table 8. The results of the One Way ANOVA which has been applied in order to designate whether primary school teacher candidates' individual innovativeness points show any difference according to their fathers' education levels or not

N, Mean and sd Values					ANOVA Results					
Point	Groups	N	Mean	sd		Sum of Squares	df	Mean Square	F	p
Individual Innovativeness	Primary school	80	61.11	7.36	Between G.	644.82	3	214.94	3.52	.02*
	Middle school	33	61.24	7.5	Inside G.	11471.49	188	61.02		
	High school	55	59.13	7.0	Total	12116.31	191			
	University	24	65.33	11.0						

It has been found that there is no statistical significance ($p > .05$) between primary school teacher candidates' fathers' education levels and their individual innovativeness. This finding can be interpreted as education levels of the fathers have no effect on designating the primary school teacher candidates' individual innovativeness points. The results of the Tukey test that has been applied in order to identify the difference between which groups is provided in Table 9.

Table 9. The results of the Tukey test that has been applied in order to designate in which groups the primary school teacher candidates' individual innovativeness point shows differentiation according to the father education level variable

Point	Group (i)	Groups (j)	$\bar{x}_i - \bar{x}_j$	p
Individual Innovativeness	University	Primary School	4.22	.02*
		High School	6.21	.00*

According to the analysis results which was about comparing the primary school teacher candidates' innovativeness tendencies according to the father education levels, statistical significance has been found for the good of those whose fathers graduated from university by comparing the items of fathers who graduated from university, fathers who graduated from primary school and fathers who graduated from high school.

The findings regarding the primary school teacher candidates' professional innovativeness tendencies in relation to the fourth sub-problem of the research are provided in Table 10.

Table 10. The findings regarding the professional innovativeness tendencies of the primary school teacher candidates

Items: When I become a teacher;	\bar{x}	sd
1. I follow the new editions about my occupation.	4.13	.87
2. I content myself with the training I took throughout my undergraduate education.	1.81	.91
3. I attend to the in service courses.	3.87	.99
4. I attend to the general courses which will increase my professional development.	4.05	.87
5. I benefit from my colleagues experiences.	4.39	.67
6. I constantly develop myself as a teacher.	4.41	.66
7. I take into consideration the criticism of the parents.	4.31	.71
8. I take into consideration the criticism of the parents about my professional implementations.	3.97	.86
9. I make self-criticism about my own professional implementations.	4.28	.73
10. I take into consideration the criticism of my colleagues about my professional implementation.	4.26	.74
11. I learn to use new teaching technologies.	4.38	.69
12. I would be open to the internationally rising professional values.	4.13	.81
13. I attend to the scientific meetings related to my field.	3.90	.97
14. I improve my foreign language level.	3.66	1.07
15. I yield to the new school when the school I am working has changed.	4.12	.77
16. I respect to the social and cultural differences of the students.	4.53	.61
17. I learn the new assessment and evaluation approaches.	4.31	.68
18. I use the teaching strategies, methods and techniques that I have not used before.	4.12	.80
19. I search for different solutions for my professional problems.	4.29	.68
20. I communicate with the teachers who work in various countries in order to benefit from their experiences.	3.28	1.05
21. I make the students to have different perspectives.	4.40	.69
22. I encourage the professional innovativeness where I work.	4.29	.72
23. I support the different ideas of the students.	4.49	.66
24. I contribute the development of the school.	4.37	.71
25. I renew myself as the students renew themselves.	4.57	.57

When the primary school teacher candidates' professional innovativeness tendencies have been examined, it can be seen that the average value in all items changes between 1.81-4.57, in their total points it changes between 71-121 and the average of the total points is 102.25. Among all the items the primary school teacher candidates participated the most, there were items such as "I renew myself as the students renew themselves.", "I support the different ideas of the students." and "I learn the new assessment and evaluation approaches." Moreover, the least item they participated was the "I content myself with the training I took throughout my undergraduate education" item. Less participation to this item is a wanted situation.

The findings regarding if there is a difference in primary school teacher candidates' professional innovativeness tendencies according to the gender, class level, GPA, mother-father education level variables are provided in Table 11, 12, 13, 14, 15 and 16.

Table 11. Independent group T-Test results to determine whether the professional innovativeness tendencies points of the primary school teacher candidates differ according to gender

Points	Groups	N	Mean	sd	T-Test		
					t	df	p
Professional Innovativeness Tendencies	Female	148	102.2	11.08	-.05	190	.96
	Male	44	104.3	10.51			

It was found that there was no statistically significance difference ($p > .05$) in primary school teacher candidates' professional innovativeness tendencies according to their genders. This finding can be interpreted as the gender plays no role in primary school teacher candidates' designating their professional innovativeness tendencies.

Table 12. The results of the One Way ANOVA which has been applied in order to designate if primary school teacher candidates' professional innovativeness tendencies show difference according to their class levels

Point	N, Mean and sd Values				ANOVA Results					
	Groups	N	Mean	sd		Sum of Squares	df	Mean Square	F	p
Professional Innovativeness Tendencies	1	46	106.76	8.61	Between G.	2203.47	3	734.49	6.70	.00*
	2	48	101.25	10.74	Inside G.	20605.98	188	109.60		
	3	53	97.76	10.54	Total	22809.45	191			
	4	45	104.07	11.75						

It was found that there was a statistically significance difference ($p < .05$) in primary school teacher candidates' professional innovativeness tendencies according to their class levels. This finding can be interpreted as the class level is an effective factor in primary school teacher candidates' designating the professional innovativeness tendencies. The results of the Tukey test that has been applied in order to identify the difference between which groups is provided in Table 13.

Table 13. The results of the Tukey Test which has been applied in order to designate between which groups the primary school teacher candidates' professional innovativeness tendencies show difference according to class level variable

Point	Groups (i)	Groups (j)	$\bar{x}_i - \bar{x}_j$	p
Professional Innovativeness Tendencies	1	3	9.01	.00*
	3	4	-6.31	.02*

According to the analysis results regarding the dual comparison of the primary school teacher candidates' professional innovativeness dispositions according to their class level that they are studying, there was statistical significance for 1st graders between 1st -3rd graders and for 4th graders between 3rd -4th graders.

Table 14. The results of the Kruskal Wallis-H Test which has been applied to designate if the primary school teacher candidates' professional innovativeness tendencies shows difference according to their achievement point average

Point	Groups	N	Mean Rank	χ^2	df	p
Professional Innovativeness Tendencies	3.00-4.00	106	94.31	1.08	2	.584
	2.00-2.99	81	97.94			
	0.00-1.99	5	119.50			

It was found that there was no statistically significance difference ($p > .05$) in primary school teacher candidates' professional innovativeness tendencies according to their achievement point average. This finding can be interpreted as the primary school teacher candidates' achievement point average has no effect on their designation of the professional innovativeness tendencies.

Table 15. The results of the One-Way ANOVA which has been applied in order to designate if primary school teacher candidates' professional innovativeness tendencies show difference according to the mother education level variable

N, Mean and sd Values					ANOVA Results					
Point	Group	N	Mean	sd		Sum of Squares	df	Mean Square	F	p
Professional Innovativeness Tendencies	Without a diploma	19	104.05	9.81	Between G.	399.69	3	133.23	1.12	.34
	Primary School	119	101.54	10.80	Inside G.	22409.77	188	119.20		
	Middle School	20	105.90	9.21	Total	22809.45	191			
	High School/University	34	101.68	12.69						

It was found that there was no statistically significance difference ($p > .05$) in primary school teacher candidates' professional innovativeness tendencies according to the mother education level variable. This finding can be interpreted as the mother education level variable has no effect on the primary school teacher candidates' designation of professional innovativeness tendencies.

Table 16. The results of the One-Way Analysis of Variance (ANOVA) which has been applied in order to designate if primary school teacher candidates' professional innovativeness tendencies show difference according to the father education level variable

N, Mean and sd Values					ANOVA Results					
Point	Groups	N	Mean	sd		Sum of Squares	df	Mean Square	F	p
Professional Innovativeness Predisposition	Primary School	80	102.93	10.41	Between G.	245.04	3	81.68	.68	.57
	Middle School	33	103.61	10.52	Inside G.	22564.41	188	120.02		
	High School	55	100.62	11.86	Total	22809.45	191			
	University	24	102.27	11.18						

It was found that there was no statistically significance difference ($p > .05$) between the primary school teacher candidates' professional innovativeness levels and father education level variable. This finding can be interpreted as father education level variable has no effect on the primary school teacher candidates' designating their professional innovativeness levels.

Table 17. The relation between the primary school teacher candidates' individual innovativeness points and professional innovativeness tendencies

Variables	N	R	p
Individual Innovativeness	192	.53*	.00
Professional Innovativeness Tendencies			

It can be seen that there is a medium-level, positive and statistically significant relation between primary school teacher candidates' individual innovativeness points and professional innovativeness tendencies. $r = 0.532$, $p < .05$. According to this, as the primary school teacher candidates' individual innovativeness points' increase, their professional innovativeness tendencies increase as well. When the determination coefficient ($r^2 = 0.28$) is taken into consideration, the 28% of the total variance in professional innovativeness predisposition resulted from individual innovativeness level.

DISCUSSION AND CONCLUSION

In the research it has been concluded that primary school teacher candidates' average of innovativeness points' levels was low, at first. It also has been found that 2/3 of the primary school teacher candidates' innovativeness levels were low, 1/3 of the primary school teacher candidates' levels were middle and high. The results of the researches in the literature which have found the individual innovativeness of the teacher candidates (Yenice & Yavaşoğlu, 2018; Şahin-İzmirli & Gürbüz, 2017; Ünal, 2014), the teachers (Kılıç & Ayvaz-Tuncel, 2014) and the instructors (Demircioğlu, Yavuz-Konokman & Akay, 2016) as low correspond to this research's result. When the research results in the literature have been examined it has been seen that as there were researches which corresponded and supported this research's results, there were researches which did not correspond and support this research's results as well. There were researches in literature in which the individual innovativeness levels of the teacher candidates (Yorulmaz, Çokçalışkan & Çelik, 2018; Akça & Şakar, 2017; Korucu & Olpak, 2015; Adıgüzel, Kaya, Balay & Göçen, 2014; Özgür, 2013; Kılıçer, 2011; Yalçın-İncik & Yanpar-Yelken, 2011), the teachers (Parlar & Cansoy, 2017; Demir-Başaran & Keleş, 2015; Yılmaz-Öztürk & Summak, 2014) and education managers (Yılmaz & Beşkaya, 2018) have been found as moderate, and the instructors (Akgün, 2017) as high. These different results can be interpreted as it resulted from the professional identities of the teacher candidates, teachers and instructors. The differentiation between the teacher candidates may be resulted from the variables such as; their departments or universities they are studying. Qualitative studies should be conducted in order to research deeply these different results.

As the second item in the research the individual innovativeness points has been inspected from perspective of innovativeness categories and it has been found that more than half of the primary school teacher candidates were at the early majority category. It was a salient result that the category of innovators included the least number of primary school teacher candidates and there were primary school teacher candidates fell under the category of laggards as well. When the literature have been examined from the perspective of innovative categories the results of the researches in which the teacher candidates (Adıgüzel, Kaya, Balay & Göçen, 2014; Bitkin, 2012; Çuhadar, Bülbül & Ilgaz, 2013; Deniz, 2016; Gökçearslan, Karademir & Korucu, 2017; Kert & Tekdal, 2012; Kılıçer, 2011; Korucu & Olpak, 2015; Örün, Orhan, Dönmez & Kurt, 2015; Özcan, Gökçearslan & Solmaz, 2016; Öztürk-Yurtseven & Aldan-Karademir, 2017; Şahin-İzmirli & Gürbüz, 2017; Ünal, 2014; Yalçın-İncik & Yanpar-Yelken, 2011; Yenice & Yavaşoğlu, 2018; Yorulmaz, Çokçalışkan & Çelik, 2018), the teachers (Argon, İsmetoğlu & Çelik-Yılmaz, 2015; Kayasandık, 2017; Kılıç & Ayvaz-Tuncel, 2014; Parlar & Cansoy, 2017; Yılmaz-Öztürk & Summak, 2014), the education managers (Yılmaz & Beşkaya, 2018) and the instructors (Mutlu-Bayraktar, 2012) fell under the category of early majority the most correspond this researches results. There were researches in which different results were found as well. The study which found the teacher candidates fell under the category of late majority (Çelik, 2013) and the results

of the studies which found the teachers (Yılmaz & Mutlu-Bayraktar, 2014) and the instructors (Akgün, 2017; Demircioğlu, Yavuz-Konokman & Akay, 2016) fell under the category of early adopters do not correspond to the results of this research. The reason of these differences in the literature can be interpreted as the participants' who were in the study group differences in terms of taking risk.

As the third item in the research it has been found that there was no statistical significance between their individual innovativeness and their genders, their class levels, their GPA, mother education levels on the other hand there was statistical significance between the father education level and the individual innovativeness. Between the primary school teacher candidates whose father are university graduates and whose fathers are primary school and high school graduates, a difference has been found for the benefit of the ones whose fathers are university graduates. The studies which found no difference between the individual innovativeness points of females and males (Akça & Şakar, 2017; Akgün, 2017; Argon, İsmetoğlu & Çelik-Yılmaz, 2015; Çuhadar, Bülbül & Ilgaz, 2013; Kılıç & Ayvaz Tuncel, 2014; Kılıçer, 2011; Korucu & Olpak, 2015; Özgür, 2013; Öztürk-Yurtseven & Aldan-Karademir, 2017; Yenice & Yavaşoğlu, 2018; Yılmaz & Beşkaya, 2018), the teacher candidates who study at different class levels (Akça & Şakar, 2017; Örün, Orhan, Dönmez & Kurt, 2015; Özgür, 2013; Şahin-İzmirli & Gürbüz, 2017; Yalçın-İncik & Yanpar-Yelken, 2011; Yenice & Yavaşoğlu, 2018), teacher candidates who have different GPA (Adıgüzel, Kaya, Balay & Göçen, 2014), teacher candidates whose mothers have different levels of education (Özgür, 2013) correspond with the results of this study. There are studies in the literature in which different results have determined. The studies' results which have determined that females are more innovative than males (McQuiggan, 2006), males are more innovative than females (Yüksel, 2015), different education levels of the fathers have effect on the teacher candidates' innovativeness points (Özgür, 2013) and the teacher candidates who study at different class levels have different innovativeness points (Korucu & Olpak, 2015; Özgür, 2013) do not correspond to the results of this study.

As the fourth item in the study, when the primary school teacher candidates' professional innovativeness tendencies points have been examined it has been interpreted as their tendencies will be life time. This situation corresponds to the results that have been found by Yılmaz, Soğukçeşme, Ayhan, Tuncay, Sancar and Deniz (2014).

As the fifth item in the research it has been found that there was no statistical significance in primary school teacher candidates' professional innovativeness predisposition points according to their genders, GPA, mother-father education levels. On the other hand it has been found that there was statistical significance in their professional innovativeness predisposition according to their class levels they study. Statistical significance has been found on behalf of the 1st grader teacher candidates between 1st graders and 3rd graders teacher candidates, additionally statistical significance has been found on behalf of the 4th grader teacher candidates between 3rd and 4th grader teacher candidates. Soğukçeşme, Ayhan, Tuncay, Sancar and Deniz (2014) have found in their study that there was statistical significance between professional innovativeness predisposition and gender; on the other hand they have found that there was no statistical significance between professional innovativeness predisposition and the class levels which does not correspond to the findings of this research. The difference that occurred considered as the teacher candidates' professional innovativeness tendencies correlate with the idea that their departmental differences as stated again by Soğukçeşme, Ayhan, Tuncay, Sancar and Deniz (2014).

As the sixth item in the research, it has been concluded that there is positive, statistically significant relation between primary school teacher candidates' individual innovativeness points and their professional innovativeness tendencies at mediocre level. When the determination coefficient is taken into consideration,

it has been found that the %28 of the total variance in professional innovativeness predisposition stemmed from the level of individual innovativeness.

Suggestions

- It is seen that the majority of the primary school teacher candidates fell under the “early majority” and “late majority” in individual innovativeness categories. In line with this, in order to make the primary school teacher candidates to reach the “innovative” category, updating the contents of the courses in undergraduate programmes and increasing of the variety can be provided.
- In order to raise the awareness of the term “innovation” which is embraced mostly by the field of business in Turkey for the teacher candidates, the attendance of the teacher candidates should be provided to the scientific activities such as conference, seminar and workshop which would be held for the education faculties on the subjects of innovativeness, creativeness, problem solving, critical thinking.
- Projects should be planned and assignments should be given to the primary school teacher candidates to enable them to develop innovative ideas and adopt them.
- Qualitative and quantitative studies can be designed for the examination of the innovativeness profiles of the teacher candidates who study in different departments, different instructors who works in different departments from the perspective of different variables.
- The enrolment of the teacher candidates whose innovativeness is high and the primary school teacher candidates in the same project should be encouraged.

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