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Determination of Classroom Pre-Service Teachers' State of Personal Innovativeness*

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Abstract

Today, in every passing moment, a new piece of information is acquired and the accumulation of this information leads to social and technological developments. Therefore, today, individuals are expected to rapidly adjust to innovations. As such, individuals should be open to innovations and willing to adopt innovations; that is, they need to be innovative. In this regard, most of the responsibility for training innovative individuals within formal education should be assumed by classroom teachers as they are working in the first stage of compulsory education. In order to be able train innovative individuals, classroom teachers should posses the characteristics of innovativeness. Therefore, the purpose of the current study was set to be to determine the pre-service classroom teachers' state of innovativeness and investigate it in relation to different variables. The current study was conducted on 322 pre-service classroom teachers randomly selected from among the classroom teachers attending a university in 2014-2015 academic year. In the collection of the data, "Personal Innovativeness Scale" adapted to Turkish by Kılıçer and Odabaşı (2010) was employed. In the current study, the internal consistency of the scale was found to be .74. At the end of the study, it was found that the pre-service classroom teachers' mean personal innovativeness level is medium and the state of their innovativeness varies depending on gender in favor of the female pre-service teachers. Moreover, the male pre-service teachers were found to be more resistant to change than the female pre-service teachers. The grade level and academic achievement variables were found to be not significantly affecting the pre-service classroom teachers' state of innovativeness. In light of these findings, it was suggested that pre-service teachers should be given adequate training during their pre-service education so that they could design activities to educate their prospective students as innovative individuals.

Keywords: pre-service classroom teacher, personal innovativeness, innovation, gender, academic achievement, grade level

1. Introduction

Changes taking place in science and technology result in information that is rapidly falling from favor and losing its validity. Thus, individuals making up societies should acquire new information and skills to have modern and prosperous lives (Akkoyunlu, 2008). As a result, the concept of innovation that is defined as an idea, application or object viewed to be new by an individual, a group or a society (Rogers, 1995) has gained greater importance. Research has been conducted focusing on the concept of innovation in many disciplines ranging from social sciences to economy and from education to marketing. Global importance of innovation emerging as a value created by innovations are continuously being emphasized and is viewed as the key to any development parallel to the developments in technology.

The concept of innovation is closely related to the characteristics of adopters and their reactions towards innovations (Goldsmith & Foxall, 2003). Innovativeness is defined as willingness to adopt an innovation, eagerness for a change and trying new things and the degree to which a change is adopted by individuals or institutions in a social system before any other change (Braak, 2001; Rogers, 1995). Demirel and Seçkin (2008) define innovativeness as knowledge-based willingness to change and to take a risk and to go beyond what is already known. Innovativeness is seen as a concept including the concepts such as risk taking, openness to experience, opinion leadership and creativity

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(Kılıçer & Odabaşı, 2010). The common point of the definitions of innovativeness is people's differentiating in their reactions towards new things (Turhan, 2009); thus, in the center of innovativeness stand individuals (Tabak, Erkuş & Meydan, 2010). Within the social life cycle individuals differ from each other in terms of innovativeness due to their personal characteristics. On the basis of this differentiation, the concept of personal innovativeness came into being.

Personal innovativeness that can be defined as individual differences characterizing their reactions against new things is conceptualized on the basis of general behaviors, personality characteristics and special personal field characteristics (Goldsmith & Foxall, 2003). Personal innovativeness is defined by Yuan and Woodman (2010) as developing or implementing an innovation; by Kılıçer (2011) as the individual's willingness for an innovation, adoption of it, developing a positive viewpoint of it and making use of or capitalizing on it; by Midgley and Dowling (1978) as a personality characteristic having social and psychological dimensions. Individuals adopt an innovation early or late, can be more or less willing for an innovation and might take more or less risk.

Classification of the concept of innovation can be made on the basis of many different variables such as individual and social necessities, differences and past experiences (Çuhadar, Bülbül & Ilgaz, 2013). Depending on these characteristics and processes of adopting innovations, individuals are classified as innovators, pioneers, interrogators, skeptics and traditionalists (Rogers, 1995).

Innovators are people who want to take risk, are willing to try new ideas, enterprising, curious, trust in scientific information, have higher level thinking skills; pioneers are people who lead the way, are proponents of change, can be role models, can use communication tools effectively, are opinion leaders, have a vision; interrogators are people who are cautious about adopting innovations, are not very willing to take risk and have an average life expectancy; skeptics are people who are diffident against innovations, wait for the majority of the society to adopt an innovation, are in need of help when technology is concerned, have low level of education, have high average age, prefer interpersonal communication; traditionalists are people who are firmly committed to their traditions and routines, are prejudiced against innovations and changes, are in need of great help for technology, and have limited social communication and interaction (Beal & Bohlen, 1956; Kılıçer, 2011; Özgür 2013; Rogers, 1995; Kılıç, 2015).

Rapid phase of social transformation results in changes in the human profile needed. These changes in the human profile require individuals to adopt innovations, to adapt to changes and to make contribution to changes (Kılıç, 2015). Innovativeness of individuals can be developed within a construct on the basis of which lies education. Therefore, there is a need for qualified and well-educated teachers and contemporary institutions of education for the development and spread of innovativeness and for its becoming a state policy (Açıkgöz Ersoy & Muter Şengül, 2008). Innovative teachers are expected to poss life-long learning skills that enable them to professionally develop, to organize activities complying with the programs, to increase student participation, to put new skills into practice, to be open to innovations and implement them (Ritchhart, 2004; Selvi, 2011; Özgür, 2013). In this regard, pre-service teachers should be equipped with skills and knowledge required to develop personal innovativeness.

For individuals to be trained from an innovative viewpoint, teachers who are the main actors of the educational process need to internalize innovativeness. Thus, the state of teachers' innovativeness should be determined and on the basis of the findings obtained in this way, activities should be planned to develop their innovativeness and to impart innovative perspectives to them. In this connection, it can be important to determine pre-service classroom teachers' state of innovativeness and make some suggestions accordingly. In this regard, the purpose of the current study is to determine the pre-service classroom teachers' state of personal innovativeness. To this end, answers to the following questions were sought:

1) What is the pre-service classroom teachers' state of personal innovativeness?
2) Does the pre-service classroom teachers' state of personal innovativeness vary significantly depending on gender?
3) Does the pre-service classroom teachers' state of personal innovativeness vary significantly depending on their grade level?
4) Does the pre-service classroom teachers' state of personal innovativeness vary significantly depending on their academic achievement?

2. Method

The study was designed in line with the survey model and aims to determine the pre-service classroom teachers' state of personal innovativeness. The population of the study is comprised of the pre-service classroom teachers attending the Department of Classroom Teacher Education of Muğla Sıtkı Koçman University in 2014-2015 academic year and the sampling of the study consists of 322 pre-service classroom teachers randomly selected from among the population.

In the collection of the data, the Personal Innovativeness Scale was used. The Personal Innovativeness Scale was developed to evaluate the general innovativeness of individuals. The original form of the scale was developed by Hurt, Joseph and Cook (1977) and adapted to the Turkish culture by Kılıçer and Odabaşı (2010). This 20-item scale is made up of four factors that are *"Resistance to change"* reflecting the concerns of individuals against change and innovation, *"Opinion leadership"* reflecting characteristics bringing individuals into prominence within a group, *"Openness to experiences"* reflecting individuals' willingness for seeking for and trying innovation and *"Risk taking"* reflecting individuals' motivation to resist against ambiguities. On the basis of the scores taken from the scale, individuals are categorized in terms of innovativeness. In this regard, if the score taken from the scale is 80 or over, then the person is classified as "innovator"; if it is between 69 and 80, then the person is classified as "pioneer"; if it is between 57 and 68, then the person is classified as "interrogator"; if it is between 46 and 56, then the person is classified as "skeptic" and if it is 46 or lower, then the person is classified as "traditionalist". Moreover, on the basis of the mean score taken from the scale, evaluation can be conducted in relation to general innovativeness level of people. In this regard, while individuals taking 68 or a higher score are evaluated to be quite innovative, individuals taking 64 or a lower score are evaluated to have a low level of innovativeness (Kılıçer & Odabaşı, 2010). In the current study, for the whole of the scale, internal consistency coefficient was calculated to be .74.

In the analysis of the data collected in the study, first the collected data were entered into the computer environment and the data in the scales that were not properly completed were excluded from the analyses. Before initiating the analyses, Kolmogorov-Smirnov Test was conducted to determine whether the data exhibit a normal distribution and as a result of the test, the variables were found to be $p>.05$. In order to evaluate the data showing a normal distribution, descriptive statistics and in order to reveal the differences, independent-samples t-test and One-way Variance Analysis (ANOVA) were used. In the comparisons, significance level was set to be .05. In the one-way ANOVA, Tukey was used as Post Hoc. In the calculation of mean scores of personal innovativeness and its sub-dimensions, 1.00-2.33 was considered to be "Low", 2.34-3.67 was considered to be "Medium" and 3.68-5.00 was considered to be "High".

3. Findings

In this section, findings related to the research questions of the study are presented.

In Table 1, the results of the descriptive analyses concerning the pre-service classroom teachers' state of personal innovativeness and its sub-dimensions are given.

Table 1. Descritpive statistics related to the pre-service classroom teachers' state of personal innovativeness

Variables	n	k	ss	$\overline{X}$	$\overline{X}$/k	Scale
Resistance to change	322	8	5.72	23.40	2.92	Medium
Opinion leadership	322	5	3.35	18.80	3.76	High
Openness to experiences	322	5	3.16	19.59	3.91	High
Risk taking	322	2	1.64	7.10	3.55	Medium
Personal innovativeness	322	20	9.00	64.09	3.20	Medium

As can be seen in Table 1, the pre-service classroom teachers' state of innovativeness is (3.20) medium and it is medium for the sub-dimensions of resistance to change (2.92) and risk taking (3.55) and high for the sub-dimensions of opinion leadership (3.76) and openness to experiences (3.91). Moreover, on the basis of personal innovativeness classification, 1 of the participants was found to be "traditionalist", 56 were found to be "skeptic", 171 were found to be "interrogator", 78 were found to be "pioneer" and 16 were found to be "innovator".

In Table 2, the results of the analysis exploring the relationship between the pre-service classroom teachers' state of personal innovativeness and gender are presented.

Table 2. T-test analysis conducted to reveal the relationship between the pre-service classroom teachers' state of personal innovativeness and gender

Variables	Group	n	$\overline{X}$	SD	t	df	p
Resistance to change	Male	97	24.75	6.34	2.79	320	.00
	Female	225	22.83	5.35			
Opinion leadership	Male	97	18.46	3.79	-1.18	320	.23
	Female	225	18.94	3.14			
Openness to experiences	Male	97	19.10	3.54	-1.85	320	.06
	Female	225	19.81	2.96			
Risk taking	Male	97	7.25	1.79	1.11	320	.26
	Female	225	7.03	1.57			
Personal innovativeness	Male	97	62.07	9.77	-2.67	320	.00
	Female	225	64.96	8.52			

As can be seen in Table 2, the mean score taken from the scale by the male participants is $\overline{X}$ = 62.07 and the mean score taken by the female participants is $\overline{X}$ = 64.96. A statistically significant difference based

on the gender variable was found between the male and female pre-service teachers' states of personal innovativeness ($t_{(320)}$=-2.67, p<.05). This significant difference was found to be in favor of the female participants. On the other hand, the sub-dimensions of opinion leadership, openness to experiences and taking risk were found to be not varying significantly depending on the gender variable (p>.05); yet, the sub-dimension of resistance to change varies significantly depending on the gender variable in favor of the male participants ($t_{(320)}$= 2.79, p<.05).

In Table 3, analysis results related to the relationship between the pre-service classroom teachers' state of personal innovativeness and grade level are given.

Table 3. One-way ANOVA analysis concerning the relationship between the pre-service classroom teachers' state of personal innovativeness and grade level

	Group	n	X	SD	Source	SS	df	MS	F	p	
Resistance to change	1st grade	64	2.85	.67	B.Groups	264.34	3	88.11	2.72	.04	4>2
	2nd grade	72	2.76	.73	W.Groups	10269.54	318	32.29			
	3rd grade	59	2.92	.52	Total	10533.88	321				
	4th grade	127	3.05	.78							
Opinion leadership	1st grade	64	3.65	.73	B.Groups	67.92	3	22.64	2.02	.11	-
	2nd grade	72	3.78	.80	W.Groups	3549.35	318	11.16			
	3rd grade	59	3.64	.57	Total	3617.28	321				
	4th grade	127	3.85	.57							
Openness to experiences	1st grade	64	3.84	.69	B.Groups	73.19	3	24.40	2.47	.06	-
	2nd grade	72	3.98	.74	W.Groups	3136.12	318	9.86			
	3rd grade	59	3.76	.48	Total	3209.32	321				
	4th grade	127	3.99	.58							
Risk taking	1st grade	64	3.32	.78	B.Groups	28.89	3	9.63	3.64	.01	4>1
	2nd grade	72	3.50	.98	W.Groups	840.72	318	2.64			
	3rd grade	59	3.49	.62	Total	869.61	321				
	4th grade	127	3.72	.79							
Personal innovativeness	1st grade	64	3.16	.45	B.Groups	364.00	3	121.33	1.50	.21	-
	2nd grade	72	3.28	.45	W.Groups	25649.20	318	80.65			
	3rd grade	59	3.13	.38	Total	26013.20	321				
	4th grade	127	3.21	.47							

- 1: 1st grade =64, 2: 2nd grade =72, 3: 3rd grade =59, 4: 4th grade =127

As can be seen in Table 3, there is no significant correlation between the pre-service classroom teachers' state of personal innovativeness and the grade level they are attending ($F_{(3-318)}$=1.50, p>.05). Moreover, no significant correlation was also found between the sub-dimensions of opinion leadership and openness to experiences and the grade level variable ($F_{(3-318)}$=2.02; $F_{(3-318)}$=2.47, p>.05); yet, significant correlations were found between the sub-dimensions of resistance to change and risk taking and the grade level variable ($F_{(3-318)}$=2.72; $F_{(3-318)}$=3.64, p<.05). The significant correlation between the sub-dimension of resistance to change stems from the difference between the second-year students and the fourth-year students favoring the fourth year students. The significant correlation between the sub-dimension of risk taking and the grade level variable stems from the difference between the fourth-year students and first-year students favoring the fourth-year students.

In Table 4, the analysis results concerning the relationship between the pre-service classroom teachers' state of personal innovativeness and academic achievement are presented.

Table 4. The one-way ANOVA results related to the relationship between the pre-service classroom teachers' state of personal innovativeness and their academic achievement

	Group	n	X	SD	Source	SS	df	MS	F	p	
Resistance to change	1	99	2.93	.71	B.Groups	4.01	2	2.00	.06	.94	-
	2	138	2.93	.72	W.Groups	10529.87	319	33.00			
	3	85	2.90	.69	Total	10533.88	321				
Opinion leadership	1	99	3.71	.77	B.Groups	17.76	2	8.88	.78	.45	-
	2	138	3.81	.60	W.Groups	3599.51	319	11.28			
	3	85	3.72	.64	Total	3617.28	321				
Openness to experiences	1	99	3.90	.67	B.Groups	1.03	2	.51	.05	.95	-
	2	138	3.92	.60	W.Groups	3208.28	319	10.05			
	3	85	3.92	.62	Total	3209.32	321				
Risk taking	1	99	3.56	.80	B.Groups	3.03	2	1.51	.55	.57	-
	2	138	3.50	.83	W.Groups	866.58	319	2.71			
	3	85	3.61	.83	Total	869.61	321				
	1	99	3.18	.44	B.Groups	15.14	2	7.57	.09	.91	-
	2	138	3.21	.44	W.Groups	25988.05	319	81.49			
	3	85	3.21	.46	Total	26013.20	321				

As can be seen in Table 4, there is no significant correlation between the pre-service classroom teachers' state of

personal innovativeness and its sub-dimensions and their academic achievements ($F_{(2-319)}$=.09, p>.05). The pre-service classroom teachers' academic achievement does not lead to a significant difference in their state of personal innovativeness. Furthermore, though not significant, the pre-service teachers with higher academic achievements have higher personal innovativeness.

4. Discussion and Results

The findings of the current study revealed that the pre-service classroom teachers' personal innovativeness is at a medium level. In light of this finding, it can be argued that the pre-service classroom teachers cannot adopt innovations immediately, they are cautious about them and they are not very willing to take risk. In the studies conducted by Uras (2000) with teachers, by Yılmaz (2013) with pre-school teachers and by Kılıç (2015) with elementary school teachers, the innovativeness level of the participants was found to be low. However, in the literature, it was concluded by Timu çin (2009), Kılıçer and Odabaşı (2010), İncik and Yelken (2011), Adıgüzel (2012), Çuhadar, Bülbül and Ilgaz (2013), Özgür (2013), Yılmaz Öztürk and Summak (2014) that teachers and pre-service teachers have high level of innovativeness. Of the sub-dimensions of personal innovativeness, "openness to experiences" has a higher mean than the other sub-dimensions. This finding concurs with the findings reported by Akın Kösterelioğlu and Demir (2014), Özgür (2013) and Kılıç (2015). The current study also found that the highest number of the pre-service classroom teachers is classified as "interrogator". The people in this group have been reported to be cautious against innovations and to carefully evaluate their strengths and weakness before adopting them (Rogers, 1995). The reason for the pre-service teachers' displaying inquisitive attitudes towards innovations might be the frequency of changes and innovations in today's world. Moreover, the pre-service teachers seem to be hesitant about taking risk and it takes some time for them to adopt innovations as they tend to analyze the positive and negative sides of their actions. This will weaken their performance and make them slower in doing what they want to do. Similar findings were also reported by Kılıçer (2011), Kert and Tekdal (2012), Çuhadar, Bülbül and Ilgaz (2013), Özgür (2013), Yılmaz (2013), Yılmaz Öztürk and Summak (2014), Önen and Koçak (2014), Köroğlu (2014), Kılıç (2015).

It was found that the pre-service classroom teachers' personal innovativeness scores did not vary significantly depending on the gender variable. Though not significant, the female pre-service teachers' personal innovativeness mean score is higher than that of the male pre-service teachers. In light of this finding, it can be argued that the female pre-service teachers can more easily adopt and implement innovations when compared to the male pre-service teachers. This might be because the female pre-service teachers assume more pioneering roles and are less prejudiced. Ayhan et al. (2012) found that the pre-service classroom teachers' level of professional innovativeness varies significantly depending on their gender and the female pre-service teachers are more innovative. On the other hand, Kert and Tekdal (2012), Özgür (2013), Rogers and Wallace (2011), Adıgüzel, Kaya, Balay and Göçen (2014), Kılıç (2015) concluded that there is no significant correlation between personal innovativeness scores and gender. Furthermore, in the current study, it was also found that there is a significant correlation between the sub-dimension of resistance to change and gender in favor of the male pre-service teachers. In this regard, it can be maintained that the male pre-service classroom teachers are more resistant against adopting and implementing the change than the female pre-service teachers.

It was also found that the pre-service classroom teachers' personal innovativeness scores do not vary significantly depending on the grade level variable. Thus, it can be argued that the education taken does not result in significant difference in the pre-service teachers' personal innovativeness. This finding concurs with the findings reported by Örün, Orhan, Dönmez and Kurt (2015), Kılıçer (2011). However, it is not supported by the findings of Adıgüzel (2012), Özgür (2013), Korucu and Olpak (2015). On the other hand, it was found that the sub-dimensions of risk taking and resistance to change vary significantly depending on the gender variable. In terms of resistance to change, the fourth-year students were found to be more resistant than the second-year students. This might be because of their more mature personality; thus, it might be more difficult for them to adapt to changes. In terms of taking risk, the fourth-year students were found to be more prone to taking risk than the first-year students. It seems that the fourth-year students are more tended to taking risk and this might indicate their greater openness to innovations.

In terms of the academic achievement variable, no significant difference was found among the pre-service teachers' personal innovativeness scores. Thus, whether the pre-service teachers' academic achievement' being low or high cannot be associated with their innovativeness. Yet, the innovativeness scores of the pre-service teachers with high academic achievement were found to be higher than those of the pre-service teachers with low academic achievement. In this connection, though with increasing academic achievement, no significant difference was observed in the innovativeness levels of the pre-service teachers, greater academic achievement causes a slight increase in innovativeness. In light of the findings of the current study, it can be suggested that to enhance the innovativeness of pre-service teachers, their undergraduate program and course contents should be designed in such a way as to improve their personal innovativeness. In addition to this, academic and individualized activities need to be developed to improve pre-service teachers' personal innovativeness characteristics. For generalizing the findings of the current

research, further research should be conducted with pre-service teachers from different universities.

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