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INVESTIGATION INTO ATTITUDES OF PRE-SERVICE TEACHERS TOWARDS E-LEARNING WITH RESPECT TO THEIR INDIVIDUAL INNOVATIVENESS LEVELS

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Abstract

Owing to advancements in both information and communication technologies and especially in the internet infrastructure, globalization has shifted to the next dimension; and these developments in technology has expressed its significance in online education like other domains of life. Utilization from new technologies has significantly minimized limitation brought by space and time in online learning progressively. Now, individuals are able to take classes from any institutions across the word. Accordingly, this situation has motivated majority of education institutions around the world to look for ways to maintain their courses or various education programs in e-learning environment more effectively. Along this process, studies on significant factors on application of technology have intensified. One of these key factors is considered as personal characteristic. When it comes to utilization of technology, individual innovativeness concept gains prominence based on personal behaviors relevant with innovativeness. Attitudes of pre-service teacher towards e-learning are influent on numbers of variable relevant with e-course. Thus, the purpose of the present study is to reveal the changes in attitudes of pre-service teachers who take online classes towards online learning with respect to their individual innovativeness levels. Study data was collected from students who take online classes through distance education system in a bachelor degree program at faculty of education at a public university. On the basis of collected data, it was revealed that pre-service teachers' attitude towards e-learning differs significantly according to respondents' levels of individual innovativeness.

Keywords: Attitude towards e-learning, individual innovativeness, Pre-service teacher.

INTRODUCTION

E-learning environments have been prominently interesting subject along the recent years parallel to the advancements in internet technologies and infrastructure, and increasing need for learning and due to various reasons. E-learning is a popular learning environment in the information age (Liaw, Huang & Chen, 2007). In the concept of "E-learning", whereas "e" stands for how to digitalize the course; that is, how to present it in an electronic format; "learning" section represents content to be taught and the learning means to transfer this content to human beings effectively. Moreover, it includes how to be successful in ensuring establishment of skills necessary for educational institutions or organizations to reach their learning targets to increase their operational performances (Clark & Mayer, 2003). In our contemporary word, universities prefer e-learning to accomplish their targets related with various courses offered in their bachelor and master degree programs. Especially, portion of prerequisite courses are taught through e-learning system. According to the results of a study conducted on 6.504 undergraduate students, 12% of students stated that they are reluctant to take fully online class (Baran, Kilic, Bakar Corez & Cagiltay, 2010). In another study, 52.9% of respondent students stated that they do not find distance education program interesting; and that 77.6% never follow the program at all (Gülnar, 2008). In spite of these unfavorable findings reported, the demand for e-learning has been increased with a great pace; and application developers and researchers have been strived for development of superior and more efficient learning environments. In this regard, researchers have been oriented on various characteristics of learners. One of these is affective characteristic. Attitude is considered among the affective characteristic.

Attitude is he characteristic of individuals, which motivates them to exhibit either positive or negative behavior and which reflect feeling and cognizance toward a certain concept or subject (Triandis, 1971). Attitude refers feelings of individuals toward something (Robbins, 1994). Determination of an attitude of individuals toward a stimulus will be an estimator of behavior of that person toward the relevant stimulant (Homer & Kahle, 1988). Determination of attitude of pre-service teachers toward e-learning would provide information regarding their feeling and accordingly their behaviors toward online courses in their educational life and e-learning commonly experienced during in-service training in their professional life.

Another personal characteristic of individuals is their individual innovativeness profiles. In education process of teachers, individual innovativeness characteristic is important in terms of their inclination to use new technologies (Rosen, 2004). Rogers (2003) exhibits innovativeness profiles of individuals under five groups. People who are inclined to try new opinions and to take risk are called as "Innovators"; the ones who inform and guide others about current novelties as "Early Adopters"; the ones who act cautious toward novelties, who are reluctant about taking risk as "Early Majority"; persons who are skeptical and timid about novelties "Late Majority"; and person who exhibit resistance to change and who have prejudice about change, and who tend to adopt novelties in the end as the last group called as "Laggards".

Agarwal and Prasad (1998) claim that attitude toward practicing a novelty affects the intention of that person's intention to use technology as well. There are other studies in the literature, which support this view. Van Braak (2001) reports a correlation between innovativeness levels of teachers and their attitude toward computer in his study on teachers. Similarly, in the study conducted by Yilmaz and Bayraktar (2014), a significant correlation between individual innovativeness and attitude toward usage of education technologies was reported. Köroğlu (2014) reported a significant correlation between individual innovativeness and attitude toward usage of technological equipment as well. Accordingly, it will be beneficent to investigate individual innovativeness together with attitude toward e-learning.

In the Gazi University, where the present study conducted, part of classes is offered in e-learning form. Gazi University offers following classes in totally online environment: "Atatürk Principles and Turkish Revolution History", "Turkish Literature" and "Foreign Language". Attitudes of pre-service teachers who receive online education toward e-learning would be an indicator to estimate their behaviors toward the current course and the online education activities in the future. In this regard, it is important to support the subject regarding the

correlation between individual innovativeness levels of pre-service teachers, which has important in adoption of novelties relevant with technology and their attitude toward e-learning by means of studies. Essential purpose of the present study is to investigate the difference in attitudes of pre-service teachers toward e-learning with respect to their individual innovativeness level.

METHOD

The present study has screening model pattern. This model is a quantitative research method to describe or define attitudes, behaviors, opinions or characteristics of a society or sampling group (Creswell, 2012). In this study, 1st and 2nd grade pre-service teachers who take joint classes through distance education and who are from the Faculty of Educational Science at the Gazi University in the fall semester of the academic year 2015-2016.

Study Group

The research includes 120 pre-service teachers from following departments of the Faculty of Educational Sciences at the Gazi University: "Primary School Math Teaching", "Natural Sciences Teaching", "Primary School Teaching", "Turkish Teaching", and "Art Teaching". The reason for preferring these departments within the scope of this research is that researchers are directly lecturing to these grades within the scope of information technology course, which provides convenient access. Student distribution according to departments was exhibited in Table 1.

Table 1: Distribution of Pre-service Teachers According to Departments

Department	f	%
Grade Teaching	34	28.3
Primary School Math Teaching	28	23.3
Natural Science Teaching	27	22.5
Turkish Teaching	13	10.8
Art Teaching	12	10.0
Philosophy-Group Teaching	6	5.0
Total	120	100

Common classes are offered in the distance education system after the fall semester of the academic year 2014-2015. Therefore, only 1st and 2nd grade students were included within the scope of this study. Distribution students according to their grades were exhibited in Table 2.

Table 2: Distribution of Students according to their grades

Grade	f	%
1st Grade	62	51.7
2nd Grade	58	48.3
Total	120	100

Data Collection Tools and Their Analysis

In the first section of the data collection tool developed by the researchers, demographical information of participants was collected. The second section includes "Individual Innovativeness Scale" and the third section includes "E-learning Attitude Scale". The Individual Innovativeness Scale developed by H. Thomas Hurt, Katherine Joseph and Chester. D. Cook in 1977 was adapted into Turkish by Kılıçer and Odabaşı (2010); and its validity and reliability studies were conducted. Whereas the scale is composed of totally 20 items; 8 of these items were reverse-coded. If total score gained from the scale is above 80; then, respondent is considered as "Innovators". If the score is in the range of 69 and 80, they are considered as "Early Adopters". The range of 57 - 68 is considered as "Early Majority"; the range of 46 - 56 is "Late Majority"; and the ones with score less than 46 are considered as "Laggards". Internal consistency coefficient and test-retest reliability of the scale which displays four-factor structure were estimated at 0.82 and 0.87, respectively. In the final section of this study,

"e-learning Attitude Scale" developed by Haznedar and Baran (2012) were employed. Whereas Cronbach's Alpha reliability coefficient was estimated at 0.93 for single-factor scale; it was estimated at 0.92 in this study.

FINDINGS

First, without considering the difference in attitude toward e-learning according to individual innovativeness level, it was found appropriate to exhibit distribution of individual innovativeness profiles according to grades and departments to be more descriptive. Therefore, distribution of respondent pre-service teachers on the basis of their department, grade and individual innovativeness profiles was given in Table 3 and Table 4.

Table 3: Individual Innovativeness Profiles of Pre-Service Teachers According to Their Grades

			Innovativeness Profile					
			Innovators	Early Adopters	Early Majority	Late Majority	Laggards	Total
GRADE	1	N	0	12	40	10	0	62
		Grade Percentage	%0.0	%19.4	64.5%	%16.1	%0	%100.0
		Innovativeness Profile Percentage	%0.0	%33.3	62.5%	%66.7	%0	%51.7
	2	N	5	24	24	5	0	58
		Grade Percentage	%8.6	%41.4	%41.4	%8.6	%0	%100.0
		Innovativeness Profile Percentage	%100.0	%66.7	%37.5	%33.3	%0	%48.3
	Total	N	5	36	64	15	0	120
		Grade Percentage	%4.2	%30.0	%53.3	%12.5	%0	%100.0
		Innovativeness Profile Percentage	%100.0	%100.0	%100.0	%100.0	%0	%100.0

According to Table 3, 40 of the pre-service teachers from the 1st grade were determined in the "Early Majority" profile group (64.5%); 12 were determined in the "Early Adopters" (19.4%); 10 were in the "Late Majority" (16.1%). In terms of distribution of the 2nd grade students, 24 pre-service teachers were determined in each of the "Early Adopters" and "Early Majority" innovativeness profiles (41.4%); and 5 pre-service teachers were determined in each of the "Innovators" and "Late Majority" profiles (8.6%). When the table is seen as a whole, it can be observed that pre-service teachers are mostly found in the "Early Majority" (53.3%) profile. In terms of number of pre-service students, this group is followed by "Early Adopters" (30%), then, "Late Majority" (12.5%) and finally "Innovators" (4.2%).

Table 4: Individual Innovativeness Profiles According to Departments

			Innovators Profile					
			Innovators	Early Adopters	Early Majority	Late Majority	Laggards	Total
DEPARTMENTS	Grade Teaching	N	0	8	21	5	0	34
		Department Percentage	%0.0	%23.5	%61.8	%14.7	%0	%100.0
		Innovativeness Profile Percentage	%0.0	%22.2	%32.8	%33.3	%0	%28.3
	Math	N	0	5	18	5	0	28

	Department Percentage	%0.0	%17,9	%64.3	%17,9	%0	%100.0
	Innovativeness Profile Percentage	%0.0	%13.9	%28.1	%33.3	%0	%23.3
Natural science Teaching	N	3	10	11	3	0	27
	Department Percentage	%11.1	%37,0	%40.7	%11.1	%0	%100.0
	Innovativeness Profile Percentage	%60.0	%27,8	%17,2	%20.0	%0	%22.5
Turkish Teaching	N	1	4	6	2	0	13
	Department Percentage	%7,7	%30.8	%46.2	%15.4	%0	%100.0
	Innovativeness Profile Percentage	%20.0	%11.1	%9.4	%13.3	%0	%10.8
Art Teaching	N	1	8	3	0	0	12
	Department Percentage	%8.3	%66.7	%25.0	%0.0	%0	%100.0
	Innovativeness Profile Percentage	%20.0	%22.2	%4.7	%0.0	%0	%10.0
Philosophy Group Teaching	N	0	1	5	0	0	6
	Department Percentage	%0,0	%16,7	%83,3	%0,0	%0	%100,0
	Innovativeness Profile Percentage	%0,0	%2,8	%7,8	%0,0	%0	%5,0
Total	N	5	36	64	15	0	120
	Department Percentage	%4.2	%30.0	%53.3	%12.5	%0	%100.0
	Innovativeness Profile Percentage	%100.0	%100.0	%100.0	%100.0	%0	%100.0
	Total Percentage	%4.2	%30.0	%53.3	%12.5	%0	%100.0

According to Table 4, except the Art Teaching department, all departments display the “Early Majority” profile at highest percentage level. On the other hand, Art Teaching department displays “Early Adopters” profile with the highest number of pre-service teachers. Additionally, none of the departments include pre-service teacher with “Laggards” profile.

Does Attitude of Pre-service Teachers toward E-Learning Exhibit Difference with Respect to Their Individual Innovativeness Profile?

In the analysis process of the data collected through data collection tools, whether they exhibit normal distribution was analyzed first. Since it was determined that they did not have normal distribution, a non-parametric test was found appropriate for analysis. Since attitude is a continuous variable and individual innovativeness is a categorical variable, Kruskall Wallis H-Test for Independent Samples was conducted to investigate the effect of “individual innovativeness” variable on attitude.

Table 5: Kruskall Wallis Test Result for Attitude Scores toward E-Learning with Respect to the Individual Innovativeness Profiles

Individual Innovativeness	n	Mean Rank	SD	X^2	p	Significant Difference
Innovators (1)	5	36.50	3	10.26	.016	1-2. 1-3.
Early Adopters (2)	36	73.79				1-4
Early Majority (3)	64	53.82				2-3. 2-4.
Late Majority (4)	15	65.10				3-4.
Total	120					

Results of the Kruskall Wallis test conducted on data collected from pre-service teachers with different individual innovativeness profiles regarding their attitude toward e-learning were exhibited in Table 5. The analysis results expose that attitudes of pre-service teachers towards e-learning differ according to their individual innovativeness profiles significantly X^2 (SD=3. n=120)=10.26. ($p<.05$). This difference suggests that individual innovativeness profiles have various effects on attitudes of pre-service teachers toward e-learning. According to the mean scores of individual innovativeness profiles, the group with the highest attitude score was determined as "Early Adopters"; and this was followed by "Late Majority", "Early Majority" and "Innovators". Similarly, Köroğlu (2014) reported positive and significant correlation in his study between attitude of teachers toward usage of technological equipment and device in pre-school education and their individual innovativeness profiles. Yilmaz and Bayraktar (2014) found a positive significant correlation between attitudes towards education technologies and teachers' innovativeness profiles.

In order to investigate the difference in attitude toward e-learning with respect to individual innovativeness profiles, Mann Whitney U-test was conducted. Separate results of the test conducted for each profile were summarized in Table 6.

Table 6: Mann Whitney U-test Results for Attitude toward E-Learning with Respect to Individual Innovativeness Profiles

Individual Innovativeness	n	Mean Rank	Rank Sum	U	p
Innovators (1)	5	12.00	60.00	45.00	.073
Early Adopters (2)	36	22.25	801.00		
Innovators (1)	5	23.60	118.00	103.00	.187
Early Majority (3)	64	35.89	2,297.00		
Innovators (1)	5	6.90	34.50	19.50	.116
Late Majority (4)	15	11.70	175.50		
Early Adopters (2)	36	61.01	2,196.50	773.50	.007
Early Majority (3)	64	44.59	2,853.50		
Early Adopters (2)	36	27.53	991.00	215.00	.255
Late Majority (4)	15	22.33	335.00		

Early Majority (3)	64	38.34	2.454.00	374.00	.185
Late Majority (4)	15	47.07	706.00		

According to Table 6, the only significant relationship was only determined between attitude scores of the "Early Adopters" and "Early Majority" profiles (U=773.50; p<.05). When mean rank is taken into consideration, it can be observed that "Early Adopters" have higher attitude scores in comparison with "Early Majority" profile. No any significant difference was determined among other profiles (Innovators - Early Adopters; Innovators- Early Majority; Innovators - Late Majority; Early Adopters - Late Majority; Early Majority - Late Majority).

CONCLUSION

In the present study, the difference in attitude of pre-service teachers towards e-learning with respect to their individual innovativeness profiles. Additionally, associated with this change, distribution of individual innovativeness profiles were described according to department and grades. Accordingly, whereas "Early Majority" profile was determined as the prominent group among the 1st graders; "Early Adopters" and "Early Majority" profiles were determined as prominent profiles among the 2nd graders. Moreover, another remarkable point was that all of the pre-service teachers displaying "Innovators" profile were on the 2nd grade. Another interesting point is that there was no any pre-service teacher from the research sampling, who was determined in the "Laggards" profile. The reason for this finding can be considered that sampling group was consisted of pre-service teachers born in the period of 1995-1998; that is, they were the individuals from the Y-generation or digital-native as they are characterized in the relevant literature. Although birth years of people cannot be the sole determinant of their inclination toward usage of technology, it is possible to claim that usage of digital tools and internet have been significantly increased afterwards of 1990s both in the world and in Turkey. Thus, technology usage has started to be one of the ordinary daily activities of this new generation (Ng, 2012).

On the basis of obtained findings, pre-service teachers' attitude toward e-learning differs significantly with respect to their "Individual Innovativeness" profiles. This significant difference was observed in the favor of "Early Adopters" in comparison with "Early Majority" profile. Yilmaz and Bayraktar (2014), in their study which investigates the correlation between attitude toward usage of education technologies and individual innovativeness, report that attitude scores of "Innovators" and "Early Adopters" are greater than others. Furthermore, in the same study, it is reported that attitudes of "Innovators" pre-service teachers towards usage of education technologies is positive (Yilmaz and Bayraktar, 2014). For the future relevant studies, it is suggested to research on attitude toward e-learning with respect to other individual characteristics. It would also be beneficent to repeat the present study on larger sample group. Moreover, determination and reporting of variables which could enhance attitudes of pre-service teachers towards e-learning would significantly contribute into the relevant literature.

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