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Research Article

Investigation of Instructional Technology Acceptance and Individual Innovativeness of Academicians [1]

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Abstract

The purpose of this study is to investigate individual innovativeness and instructional technologies acceptance of academicians in Faculty of Education. The participants of this mixed methods study are 92 academicians on duty between the years of 2013 and 2014 in public universities. This study was conducted using a scale of "Individual Innovativeness", created by Hurt, Joseph, and Cook (1997) and adapted by Kılıcer and Odabasi to comply with Turkish culture. Another scale of "Technology Acceptance Model (TAM)" developed by Davis (1989) was also used for the purpose of this study. TAM scale was adapted by the researcher to comply with Turkish culture. Qualitative data were collected from 13 academicians with different specialty areas and seniority using semi-structured interview form. Statistical tests were used to analyze quantitative data, and content

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analysis was used to analyze qualitative data. According to the findings obtained from quantitative and qualitative data that academicians have high levels of individual innovative characteristics such as leadership characteristic. The academicians also have positive perspectives towards acceptance, usage, and usefulness of instructional technologies. This study found a positive and significant relationship between participants' individual innovativeness characteristics and acceptance perception towards instructional technology. This study also showed that qualitative and quantitative data supported one another. The researcher made suggestions regarding innovativeness and instructional technology acceptance.

Keywords: *Individual innovativeness, technology acceptance, instructional technologies, academicians*

Introduction

It is expected of individuals to know their responsibilities, question, and produce to put innovations into practice and use technology effectively in education. If teachers are considered to bring change and innovation, as a result, shaping education (Bakkenes, Vermunt, & Wubbels, 2010), it is required for teachers to come up with creative ideas, learn new instructional techniques, and keep up with the developments of their field (Pollock, 2008). It is crucial for academicians, who educate these teachers, to accept change and innovation in education, integrate innovations and technology into education, and use instructional technologies in their instruction effectively. Accepting change and innovation, especially in education environments, depends on if individuals adopt innovation, have innovative perspective, and even cooperate with individuals in education when necessary (Al-Husseini & Elbeltagi, 2016; Könings, Gruwel, & Merrienboer, 2007). Related to the phenomenon of innovation, Rogers (1995) use the term of an idea, application or object that an individual or individuals perceive as new, whereas Goldsmith and Foxall (2003) describe innovation sometimes as a creative process behind the emergence of new ideas and applications, sometimes new ideas and applications themselves, and sometimes a piece of cognitive and behavioral reactions of individuals who adopt an existing innovation. The phenomenon of innovativeness is described as a desire to change and try new things (Hurt, Joseph, & Cook, 1977); as a degree to which individuals adopt innovation prior to other things (Rogers, 1995); as reactions of individuals towards innovations (Goldsmith & Foxall, 2003); and as creativity, risk taking, being open to experience, and idea leadership (Kılıçer & Odabaşı, 2010; Şahin İzmirli & Gürbüz, 2017). The circumstances of individuals to accept any change and innovation might be different from individual to individual. Considering the individual differences, Rogers (2003) evaluates innovativeness under five categories.

- Innovators: Individuals who love to try new ideas and take risk, have the ability to think forward, accept change before anyone, are in interaction with their environment, and have entrepreneur and creative skills.
- Early Adapters: Individuals who inform others about innovations, lead people, influence society to a great extent, share what they know, and adopt innovation early.

- Early Majority: Individuals who form the majority of society and have good relationships with others, are timid to adopt innovation, and are not willing about taking risk too much.
- Late Majorities: Individuals who are timid towards and skeptical about innovations, expect majority of people to adopt innovations, and have fears and worries about this situation.
- Laggards: Individuals who are dependent on traditions, are prejudiced and conservative towards change, are unrealistic to events, and are at the backstage in adopting innovations.

Embracing Rogers' (2003) expansion of innovations theory, Moore and Bensabat (1991) investigate the adoption forms of information technologies whereas Vanderlinde and Braak (2011) study the interest of teachers towards new generation information and communication technologies. Most important factor towards accepting innovations is the usefulness of innovation towards individual and society and the ease of use of innovation (Demiralay, Bayır, & Gelibolu, 2015). It is considered to be beneficial when the use of innovation is easy (Usluel & Mazman, 2010); however, one of the most important factors to use technology effectively is to be innovator towards technology (Lu, Yao, & Yu, 2005).

Various models and theories were used in majority of studies conducted in the process of accepting, adopting, and expanding innovations. Among these models and theories, Technology Acceptance Model (TAM) has been the most efficient and studied one. Davis (1985) studies TAM model and how it works in detail. In meta analysis studies about TAM (Chuttur, 2009; King & He, 2006), it was proved that this model is a reliable and valid model and is a very good tool to understand user acceptance towards many areas such as the use of LMS (Fathema, Shannon, & Ross, 2015; Schoonenboom, 2014), e-learning (Masrom, 2007; Persico, Manca, & Pozzi, 2014; Tarhini, Scott, Sharma, & Abbasi, 2015), mobile technologies (Lu, Yao, & Yu, 2005), e-mail (Davis, 1989), social networks (Arı, Yılmaz & Bekteş, 2016), software applications (Samancıoğlu, Bağlıbel, Keser Özmantar, & Çetin; 2015), educational innovations (Usluel & Mazman, 2010), e-portfolio (Cheng, Chen, & Yen, 2015), wearable locating systems (Bützler, & Schlick, 2016, Hong, Lin & Hsieh, 2017; Kwee-Meier), and information technologies (Bülbül & Çuhadar, 2012; Davis, 1989; Teo, 2011). Besides, TAM's main purpose is to explain the behavior of the individual in adopting

technology (Chang, Hajiyev, & Su, 2017), innovative and / or knowledge-based technology, which factors influence the acceptance of their products (Shih, Lu, Liu ve Wu, 2017).

TAM was created for users to adopt and predict. Recently, it has been expanding to a great extent by including education technologies. TAM emerged as a scientific paradigm to investigate the education technology acceptance of students, teachers, and many others (Teo, 2011).

When elements within TAM are analyzed, it shows individuals' usefulness perception when they believe their performance will increase if they use innovation; their intention when they are in preparation to display a behavior; their attitude when they have positive and negative thoughts about displaying a behavior; and their ease of use when they believe they can easily use something without much effort (Usluel & Mazman, 2010).

TAM advocates that technology acceptance of users shape under the impact of perceived usefulness and perceived ease of use. Perceived usefulness is explained as the degree of which individuals think their performance and efficiency increase, while perceived ease of use is explained as the perception of using system easily without any physical or cognitive effort (Davis, 1989). It is proposed that perceived ease of use has a significant impact on the attitude of perceived usefulness and use (Akman & Mishra, 2015; Chuttur, 2009; Kelly, 2014; Luan & Teo, 2011; Schoonenboom 2014), and that perceived usefulness and perceived ease of use has a positive impact on affecting intention (Luan & Teo, 2011; Schoonenboom, 2014). These two factors, which have stronger impact compared to others, have a significant impact on affecting intention and attitude of users towards technology use (Masrom, 2007). Besides, perceived usefulness forms a relationship between perceived ease of use and intention towards use (Chen & Lu, 2016). It is easier for individuals to accept technology when they think their performance will increase and technology has benefits towards what they do (Powell & Wimmer, 2016; Samancıoğlu, et al., 2015).

In the name of embracing information age, it is very important to put technological innovations into practice in every field, especially education, thanks to the opportunities provided by technology use. With the use of such information and communication technologies in education

environments, learning sources diversify, the transition from teacher-centered education system to student-centered education system accelerates (Hannafın, 2012; Hannan, 2005) and students' participation into education and training is increased through development of their creative skills (Ma, Anderson, & Strith, 2005). Because educational institutions aim to train innovativeness individuals, who can access information that they need, analyze and produce information, use technology efficiently, and integrate it into education, it is important to inform teacher candidates about the necessity of sufficient technological skills and adaptation to change and innovation in teacher education programs where learning technologies play a significant role in especially learning and teaching processes (Brenner & Brill, 2016; Zhu, 2015).

There have been many studies about the significance of being innovative and using information and communication technologies in education and training (Hannan, 2005; Jaskyte, Taylor, & Smariga, 2009; Ntemana & Olatokun, 2012; Rosen 2005). One of these studies, Rosen (2005) discusses that individual innovativeness have a significant place in understanding interest towards technology and can easily reflect this individuals' applications in the field of information technologies in his thesis that aimed to identify the effect of individual innovativeness in information technologies. In their study exploring students' and academicians' perspectives towards innovative education, Jaskyte and others (2009) propose that there are many factors such as having an innovative perception about technology use to be an innovative academician and integrating new teaching methods into education process. Besides, having the individual innovation feature has affected the use of the new technological products positively (Kim & Chai, 2017).

As it is seen from studies, educators are expected to be individuals who help to improve innovations, find solutions to problems, generate information, research, create, keep up with change and innovation, make society conscious of these and benefit from technology. It is necessary for academicians, who are responsible for educating teacher candidates, to improve themselves in their fields and use such technologies effectively (Özgür, 2013; Turan & Çolakoğlu, 2008). In this study, the purpose is to investigate the individual innovativeness characteristics and instructional technology acceptance of academicians. In the light of this purpose, following research questions were asked.

1. What are individual innovativeness characteristics of academicians?
2. Do individual innovativeness characteristics of academicians differ among gender, field of expertise, title and vocational technology use?
3. What is instructional technology acceptance of academicians?
4. Do instructional technology acceptance of academicians differ among gender, field of expertise, title and vocational technology use?
5. Is there any correlation between individual innovativeness characteristics and instructional technology acceptance of academicians?
6. What are views of academicians about innovation and innovativeness concept?
7. What kind of process do academicians follow about accepting a new idea, event or object?
8. What are views of academicians about positive and negative factors affecting innovativeness?
9. What are views of academicians about effects of educational institutions on individual innovativeness?
10. What are views of academicians about the concept of instructional technology?
11. What are views of academicians about ease of use of instructional technologies and usefulness of technology on educational activities?
12. What are views of academicians about the use of new generation instructional technologies (social networks, smart board, smartphone, tablet pc, etc.) in education?

Methodology

Research Design

This study employed a mixed methods study using qualitative and quantitative data. The mixed method aims to present, analyze and combine events in a broad framework with a comprehensive and complementary approach, bridging between quantitative and qualitative research and helping to develop the quantitative dimension of research on qualitative data (Baki & Gökçek, 2012). Co-use of qualitative and quantitative data in research involves more precise and holistic information on the theory or practice being put forward (Johnson & Onwuegbuzie, 2004). The aim of the study

was to increase the validity and reliability of the research findings using both approaches. In this study, a mixed method design, convergent parallel design was used. In this design, qualitative and quantitative data are collected together and results are compared to identify if collected data validate each other (Creswell, 2013). For the quantitative part of this study, screening model (Frankel & Wallen, 2006, Karasar, 1999) that puts forward the characteristics of participants was used and which is aimed at determining the presence and / or extent of interchange between two or more variables. For the qualitative part, in phenomenological data analysis, experiences and meanings are revealed. In content analysis made for this purpose, there is an effort to conceptualize the data and to reveal the themes that can describe the phenomenon. The results are presented in a descriptive way and frequently quoted directly (Yıldırım & Şimşek, 2011).

Participants

The participants of this study were 92 academicians teaching at a public university in Turkey in the spring semester of 2013-2014. Information about the participants can be found in Table 1. For the qualitative part of this study, 13 academicians with different specialty areas and seniority using semi-structured interview form among the 92 academicians were recruited through purposeful sampling. Information about these participants can be found in Table 2.

Table 1
General Distribution Characteristics of Academicians (Quantitative Data)

Gender	N	(%)
Female	46	50
Male	46	50
Total	92	100

Field of Expertise	N	(%)
CEIT Teach.	4	4.3
Prim. Sch. Teach.	13	14.1
Science Std. Teach.	11	11.9
Social Std. Teach.	6	6.5
Pre-School Teach.	2	2.1
Turkish Lang. Teac.	7	7.6
Special Ed. Teach.	5	5.4
German Lang. Teac.	7	7.6
English Lang. T.	13	14.1
Art and Crafts T.	5	5.4
Musics Teach.	6	6.5
Science of Educat.	13	14.1

Title	N	(%)
Prof. Dr.	2	2.1
Assoc. Dr.	7	7.6
Asst. Prof. Dr.	45	48.9
Instructor Dr.	2	2.1
Res. Asst. Dr.	3	3.2
Instructor	20	21.7
Res. Asst.	11	11.9
Lecturer	2	2.1

Technology Use	**N**	**(%)**
Rarely	4	4.3
Generally	37	40.2
Always	51	55.4

Table 2
Academicians (Qualitative Data)

Field of Expertise	Title	N	Gender
German Lang.	Assoc.Prof.Dr.	1	Male
CEIT Teach.	Assist.Prof.Dr.	1	Male
Science of Educat.	Assist.Prof.Dr.	1	Male
Science Std. Teach	Assoc.Prof.Dr.	1	Female
English Lang.	Lecturer	1	Male
Musics Teach.	Prof.Dr.	1	Male
Prim. Sch. Teach.	Assoc.Prof.Dr.	1	Female
Special Education	Assist.Prof.Dr.	1	Female
Art and Crafts Teach.	Instructor	1	Female
Primary School	Assist. Prof. Dr.	1	Female
Social Science	Assist. Prof. Dr.	1	Male
Turkish Lang.	Assist. Prof. Dr.	1	Male
Maths Teach.	Assist. Prof. Dr.	1	Female
	Total	13	

Data Collection

Data was collected through Individual Innovativeness Scale (IIS) and Technology Acceptance Scale (TAM). Personal information form was also used to gather demographic information about participants.

Individual Innovativeness Scale was originally developed by Hurt, Joseph and Cook (1977), but adapted to Turkish culture by Kılıçer and Odabaşı (2010). The survey consists of 20 items and 4 factors including "Resistance to change," "Opinion leadership," "Openness to the Experience," and "Risk Taking" Internal consistency regarding the survey is 0.82. Individuals can be categorized into innovativeness types based on their scores calculated from the survey. According to this, individuals are considered to be "Innovator" if their score is above 80, "Early Adapters" if the score is between 69 and 80, "Early Majority" if the score is between 57 and 68, "Late Majorities" if the score is between 46 and 56, and "Laggards" if the score is below 46. Regarding the innovativeness levels of individuals, they are further categorized into being extremely innovative if their score is above 68 whereas they are categorized into being a low level innovative if their score is below 64 based on the scores calculated from the survey (Kılıçer & Odabaşı, 2010).

Technology Acceptance Scale (TAM), developed by Davis (1989), constitutes of 12 items and 2 factors including "Perceived Usefulness" and "Perceived Ease of Use." Permission to use the survey was received through email. In the adaptation process of the survey, two experts translated the survey into Turkish and then into English. An English language expert analyzed the translated items and original items to find out their appropriateness in the two languages. After this process, experts in the fields of Curriculum and Instruction and Information and Communication Technology were consulted about their opinions on if each item is appropriate to our culture and if the items serve to the purpose of this study. In addition, two Turkish language experts analyzed the clarity of statements. Necessary corrections were made based on their suggestions. Factor analysis was made to verify if the survey confirms to the participants in Turkey. In the light of this, the survey was conducted to 130 academicians in the School of Education departments of various universities in Turkey. While making confirmatory factor analysis in the process of survey adaptation, X^2/df (Chi square degree of freedom), TLI (Tucker-Lewis Index) and Comparative Fit Index (CFI) values were considered. Based on analysis results, fit indices were calculated to be TLI=.92, CFI=.94 and X^2/df=2.5. When other studies were analyzed to be a sample to this study, Brown (2006) proposes that TLI and CFI values must be .90 and above, Tabachnick and Fidell (2007) argue that model is considered to be perfect when X^2/df value is below 2. According to these views, this survey can be considered to be acceptable. 2 factor structure of the survey is verified in Turkish culture as well. The regression weights of the first factor, "Perceived Usefulness" are between the values of .84 and .94. The regression weights of the second factor, "Perceived Ease of Use" are between the values of .52 and .91. Cronbach Alpha coefficient of internal consistency for the first factor is .96 whereas it is .91 for the second factor. This value for the whole survey is .92. Regarding the coefficient of internal consistency, Özdamar (2004) argued that values above .60 for coefficient of internal consistency are acceptable. Considering this argument, this survey is considered to be acceptable.

Data Analysis

In this study, test of normality was used followed by descriptive statistics, Mann Whitney U and Kruskal Wallis H tests for the quantitative data analysis. For the qualitative data analysis, content analysis was used. Following content analysis, inter rater reliability was established with an expert

academician. The formula of inter rater reliability= agreement/(agreement+divergence) was used. According to the results, reliability of this study is %89 and, therefore, this study is considered to be reliable (Miles & Huberman, 1994).

Findings

Individual Innovativeness Characteristics of Academicians

According to quantitative data, innovativeness scores show that 55 academicians are high-level innovator (%59.78), 16 academicians are medium-level innovator (%17.39), and 21 academicians are low-level innovator (%22.82). This is shown in Table 3. When the scores for individual innovativeness are analyzed, the score for "high-level innovat0r" is ($\bar{X}$ =70.09).

Table 3
Distribution According to Individual Innovativeness Levels

Innovativeness Level	n	*(%)*	$\bar{X}$	*ss*
High-level innovator	55	59.78	77.41	5.445
Medium-level innovator	16	17.39	66.18	1.376
Low-level innovator	21	22.82	53.90	7.006
Total	92	100.00	70.09	11.148

When categories for individual innovativeness of academicians are analyzed, they are generally in "Early Adapters" category. When the scores in low levels are analyzed, 40 of academicians are "Early Adapters" (%43.5), 25 of them are Early Majority (%27.02), 15 of them are Innovators (%16.3), and 9 of them are Late Majority (%.98) and 3 of them are Laggards (%0.33) as seen in Table 4.

Table 4
Distribution According to Individual Innovativeness Categories

Innovativeness Category	f	(%)
Early Adapters	40	43.5
Early Majority	25	27.2
Innovators	15	16.3
Late Majority	9	.98
Laggards	3	.33
Total	92	100.00

Table 5 shows the descriptive statistics related to the low levels of individual innovativeness of academicians. The highest mean score from the individual innovativeness scale is ($\bar{X}/m$=4.10) in the "Openness to experience" dimension, while it is ($\bar{X}/m$=2.34) in the "Resistance to Change" dimension.

Table 5
Mean Scores Related to Individual Innovativeness

Variables	n	m	$\bar{X}$	$\bar{X}/m$	*ss*
Individual Innovativeness	92	20	70.09	3.50	11.148
Openness to Experience	92	5	20.54	4.10	3.806
Opinion Leadership	92	5	18.82	3.76	3.503
Risk Taking	92	2	7.45	3.72	1.660
Resistance to Change	92	8	18.72	2.34	5.333

Instructional Technology Acceptance of Academicians

Table 6 shows the descriptive statistics related to the low factors of Instructional Technology Acceptance of Academicians scale. In the low factors of Instructional Technology Acceptance of Academicians scale, "Perceived Usefulness" dimension is ($\bar{X}$/m=6.38), "Perceived Ease of Use" dimension is ($\bar{X}$/m=5.90) and the general survey dimension is ($\bar{X}$/m=6.14) in the positive level.

Table 6
Mean Scores Related to Instructional Technology Acceptance of Academicians

Variables	n	m	$\bar{X}$	$\bar{X}$ /m	ss
Perceived Usefulness	92	6	38.28	6.38	4.84
Perceived Ease of Use	92	6	35.43	5.90	6.37
Technology Acceptance	92	12	73.71	6.14	10.34

Analysis of Individual Innovativeness Characteristics and Instructional Technology Acceptance of Academicians

Analysis of gender variable

There is no significant relationship between the scores from individual innovativeness survey of academicians and gender variable (U= 994.50, p>.05). Similarly, there is no significant relationship between the scores from instructional technology acceptance scale of academicians and gender variable (U= 1054.50, p>.05), as shown in Table 7.

Table 7
Mann-Whitney U –Test Results Based on Gender Variable of Individual Innovativeness Characteristics and Instructional Technology Acceptance of Academicians

Factor	Group	n	Mean Rank	Sum Rank	U	p
Resistance to Change	Male	46	48.82	2245.50	951.50	.404
	Female	46	44.18	2032.50		
Opinion Leadership	Male	46	45.65	2100.00	1019.00	.759
	Female	46	47.35	2178.00		
Openness to Experience	Male	46	44.33	2039.00	958.00	.432
	Female	46	48.67	2239.00		
Risk Taking	Male	46	50.38	2317.50	879.50	.153
	Female	46	42.62	1960.50		
Individual Innovativeness	Male	46	45.12	2075.50	994.50	.620
	Female	46	47.88	2202.50		
Perceived Usefulness	Male	46	46.91	2158.00	1039.00	.873
	Female	46	46.09	2120.00		
Perceived Ease of Use	Male	46	46.36	2132.50	1051.50	.959
	Female	46	46.64	2145.50		
Technology Acceptance	Male	46	46.58	2142.50	1054.50	.978
	Female	46	46.42	2135.50		

Analysis of field of expertise variable

There is no significant relationship between the scores of academicians from the scale of individual innovativeness and field of expertise variable (χ^2 =5.354, p>.05). Similarly, there is no relationship between the scores of academicians from the scale of instructional technology acceptance and field of expertise variable (χ^2 =6.317, p>.05).

Table 8.
Kruskal Wallis Test Results Based on Field of Expertise Variable for Individual Innovativeness Characteristics and Instructional Technology Acceptance of Academicians

Factor	Field of Expertise	N	Mean	df	χ2	p
Individual Innovativeness	CEIT	4	33.63	11	5.354	.913
	Prim. Sch. T.	13	36.46			
	Science Std. T.	11	46.68			
	Social Std. T.	6	40.58			
	Pre-School T.	2	46.50			
	Turkish Lang. T.	7	58.79			
	Special Ed. T.	5	51.00			
	German Lang. T.	7	47.86			
	English Lang. T.	13	50.73			
	Art and Craft T.	5	52.40			
	Musics T.	6	45.00			
	Science of Edu.	13	48.19			
Technology Acceptance	CEIT	4	54.88	11	6.317	. 851
	Prim. Sch. T.	13	36.73			
	Science Std. T.	11	40.09			
	Social Std. T.	6	46.08			
	Pre-School T.	2	42.75			
	Turkish Lang. T.	7	40.71			
	Special Ed. T.	5	59.10			
	German Lang. T.	7	48.14			
	English Lang. T.	13	51.85			
	Art and Craft T.	5	59.90			
	Musics T.	6	43.17			
	Science of Edu.	13	48.31			

Analysis of title variable

There is no significant relationship between the scores of academicians from the scale of individual innovativeness and title variable (χ^2 =9.835, p>.05). Similarly, there is no relationship between the scores of academicians from the scale of instructional technology acceptance and title variable (χ^2 =5.26, p>.05), as shown in Table 9.

Table 9
Kruskal Wallis Test Results Based on Title Variable for Individual Innovativeness Characteristics and Instructional Technology Acceptance of Academicians

Factor	Title	N	Mean	df	χ2	p
Individual Innovativeness	Prof. Dr.	2	56.25	7	9.835	.198
	Assoc. Dr.	7	54.57			
	Asst. Prof. Dr.	45	42.16			
	Instructor Dr.	2	19.75			
	Res. Asst. Dr.	3	34.83			
	Instructor	20	58.10			
	Res. Asst.	11	41.05			
	Lecturer	2	64.50			
Technology Acceptance	Prof. Dr.	2	65.25	7	5.263	. 628
	Assoc. Dr.	7	49.93			
	Asst. Prof. Dr.	45	43.97			
	Instructor Dr.	2	30.50			
	Res. Asst. Dr.	3	56.50			
	Instructor	20	42.40			
	Res. Asst.	11	57.68			
	Lecturer	2	53.25			

Analysis of vocational technology use variable

There is no significant relationship between the scores of academicians from the scale of individual innovativeness and vocational technology use variable (χ^2 =1.775, p>.05). However, there is significant relationship between the scores of academicians from the scale of instructional technology acceptance (χ^2 =20.607, p<.05) and its low level factors of Perceived Usefulness (χ^2 =19.336, p<.05) and Perceived Ease of Use (χ^2 =16.589, p<.05) and vocational technology use variable, as shown in Table 10. Mann Whitney U-test was conducted to the double combinations of all groups to identify the significance of observed difference between groups. According to the results, the score of academicians using technology always ($\bar{X}$=57.09) is more than the scores of those using technology rarely ($\bar{X}$=14.25) and usually ($\bar{X}$=35.39) in terms of vocational technology use.

Table 10
Kruskal Wallis Test Results Based on Vocational Technology Use Variable for Individual Innovativeness Characteristics and Instructional Technology Acceptance of Academicians

Factor	Frequency	N	Mean	df	χ^2	p	Significant Difference
Individual Innovativeness	Rarely	4	41.13	3	1.775	.412	
	Usually	37	42.51				
	Always	51	49.81				
Perceived Usefulness	Rarely	4	11.13	3	19.336	.001	1-2, 1-3, 2-3
	Usually	37	37.86				
	Always	51	55.54				
Perceived Ease of Use	Rarely	4	21.00	3	16.589	.001	1-3, 2-3
	Usually	37	35.89				
	Always	51	56.20				
Technology Acceptance	Rarely	4	14.25	3	20.607	.001	1-3, 2-3
	Usually	37	35.39				
	Always	51	57.09				

1-rarely, 2- usually, 3- always

Relationship Between Individual Innovativeness And Technology Acceptance

Table 11
Correlation Analysis Between Individual Innovativeness Characteristics and Instructional Technology Acceptance of Academicians

	Resistance to Change	Opinion Leader-ship	Openness to Experience	Risk Taking	Individual Innovative-ness	Perceived Usefulness	Perceived Ease of Use
Opinion Leadership	-.246*						
Openness to Experience	-.408**	.757**					
Risk Taking	-.316**	.465**	.633**				
Individual Innovativeness	-.733**	.742**	.862**	.664**			
Perceived Usefulness	-.210*	.229*	.261*	.318**	.290**		
Perceived Ease of Use	-.124	.250*	.266*	.247*	.253*	.697**	
Technology Acceptance	-.177	.273**	.285**	.283**	.293**	.848**	.960**

**. Correlation is significant in the level of .01 *. Correlation is significant in the level of .05.

According to the results from correlation analysis, there is a positive and low-level relationship between academicians individual innovativeness and instructional technology acceptance (r=.293, p<.01), as shown in Table 11. Regression analysis results show that %8.58 of instructional technology acceptance scores of academicians can be explained with the change in individual

innovativeness characteristic scores. According to this, those who have higher scores in instructional technology acceptance also have higher individual innovativeness scores (or those who have higher scores in individual innovativeness also have higher instructional technology acceptance scores).

Qualitative Data Analysis of Academicians

Following the quantitative data analysis, 13 academicians were interviewed through a semi-structured interview for the qualitative part of this study, 10 questions were asked in the interview. Following themes emerged from data analysis.

Table 12
Academicians' Opinion Toward the Phenomenon of Innovation

Theme	f
Being extraordinary/different	7
Technology	5
Creativity/new ideas/change	5
Being first/ discovery/invention	4

In the interviews with academicians, definition of innovation was explained with the terms of being extraordinary or different. Related to this, A4 said, "*About the terms of new and innovation, I think of existing outside the usual, different situations, events, and processes from cognitive schemas.*" Among academicians, definitions emphasizing similarity of innovativeness and technology were used.

Table 13
Academicians' Opinions About Innovativeness

Theme	f
Supporting/accepting/using innovations	9
Having different/unique perspective	3
Following new trends	3
Using technological equipment	3
Being creative	2
Concretizing new ideas	1

Academicians mostly used the terms of supporting any innovation, adopting and accepting innovations, using innovations about the term of innovativeness. Related to this, A4 said "*Behind the thought of creating a new thing and developing new thought, concept, or new theory is supporting, accepting, and providing support to reveal this.*" While some of the academicians focus on the necessity to have a different and unique perspective towards a previously realized application or a new situation, the others emphasize following innovations, being open to technological equipment, approach, technique or applications, being creative or putting something new on the top of what is available, concretizing thoughts and thinking of them in a broad perspective about innovativeness.

Table 14
Academicians' opinions about the method they use to solve problems

Theme Sub Theme	f
Trying New Solutions	**5**
Being innovative in academic life	4
Looking for new solutions	1
Use traditional Method	**4**
Traditional method	2
First traditional method to be quick	1
New solutions if traditional method does not work	1
One of each depending on the situation	**4**
Changing according to the quality of work	4

Some of the academicians argued that they tried to find new solutions to solve problems, and it is necessary to be innovative in the academic world, especially with the research they make. About being innovative, that is using new solutions, in academic world, A10 used the following explanation. "*Generally, a certain model is used to teach, but I find new models that have been used and are being used in my field. These might open a new window for every child, because I work on children, and there might be many different methods to reach a child.*" Some of the academicians explained that they generally preferred traditional methods that they knew better and were risk free. Others revealed that this situation was changeable for them in that they sometimes used traditional methods and sometimes innovative methods to find solutions to problems. They further explained that they would try whichever method was more beneficial when they made a choice, and they would use the most effective and least demanding method depending on the work, and their choices might change to be more effective.

Table 15
What Kind of Process do You Follow About Accepting a New Idea, Event, or Object? (Would You Prefer Being a Early Adapters or Waiting Others to Accept?

Theme	f
Inclined to be early adapters	7
Being changeable depending on the situation	3
Waiting others to try	3

While majority of the academicians mentioned that they were inclined to be early adapters, others told that this situation might be changeable depending on the situation, and that they might sometimes be inclined to be early adapters and sometimes wait others to try by keeping in the background. Related to the opinion of being inclined to be early adapters, A2 made the following explanation. "*I am on the side of being early adapters. If it is necessary to tell something in terms of being a early adapters, let me explain it this way. For instance, I would like to talk about one of the jobs that I made. There is a field called hormonology. I conducted the only research in that field around the world, and I explained all this mathematically. This might be considered as innovation and leadership in toner music.*"

Table 16
Academicians' Opinions About the Positive/Negative Factors Affecting Innovativeness

Theme Sub Theme	f	Theme Sub Theme	F
Positive Factors	**12**	Negative Factors	**12**
Supporting innovation	4	Lack of multidimensional approach	5
Benefit of innovation	3	Preconception	3
Curiosity about innovation	2	Social environment pressure	3
Information and communication technologies	1	Making innovations not for good purposes	1
Needs	1	Social environment	2
A free education environment	1		

When positive and negative factors affecting innovativeness are analyzed, academicians discussed that innovation will develop the more they support it, accepting it will be easier the more benefit it has for society. They also added that satisfying the curiosity about innovation, developing information and communication technologies, supplying the needs of society, and providing a free education environment are positive notions about innovativeness. About supporting innovation, A1 said, "*It is most probably the support in the workplace that you are in. There are 3D printers. I would love to see and try them. However, we need money and support to do this. They will agree,*

get one, and we will use it." Academicians explained that among the negative factors affecting innovation improvement are preconception towards innovation, social environment pressure, using innovation for bad purposes, not providing benefit to individuals, sometimes harming them, and personal problems such as individual's deficiency in using versatile methods.

Table 17
Academicians' Opinions About Impacts of Educational Institutions on Individual Innovativeness

Theme	f	Theme	f
Having quality educators	11	Providing opportunities for educators	2
Having innovative administrators	6	Supporting ideas	2
Providing free thought environments	4	Giving in-service training	2
Educational institutions' openness to innovations	4		

Many academicians asserted that educators on duty in educational institutions should be individuals conducting research, adapting innovations to their studies, and continuously improving themselves in their fields. Related to this, A6 made the following explanation. "*I think first institutions that expanded innovations in terms of society are educational institutions. For example, I consider myself as more of a researcher as an academician and a researcher, so I make research and reflect what I have found in my classrooms. The group that stands in front of me in classroom is a small sample of society, and that is the place for first societal meeting. If innovation is accepted there, then it is expanded to the other parts of society.*" Academicians further added that administrators in educational institutions should adopt an innovative perception and support such attempts to develop innovative individuals.

Table 18
Academicians' Opinions About the Notion of Instructional Technologies

Theme	f
All kinds of teaching materials	7
Technological tools	5
Learning outcomes, approach, assessment and evaluation, materials	1

When instructional materials are mentioned, majority of academicians mentioned that the first thing that came to their mind were all kinds of instructional materials that would make teaching easier. About this, A5 said, "*I think of any type of tools, materials, equipment that are electronic or not, to make teaching easier and provide a better learning environment for students.*" Majority

of academicians also added that they perceived the notion of instructional technologies as technological tools while one of the participants, having a theoretical perception, discussed that he accepted instructional technologies as a learning outcome, an approach, an assessment and evaluation, and a material.

Table 19
Academicians' Opinions About the Benefits of Technology on Instructional Activities

Theme	f
Supporting education and training	10
Making it easier to access information	5
Helping applications	5
Helping in terms of visual and audial sense	3
Benefit in terms of saving time	2

Majority of academicians explained that technology mostly benefits supporting education and training. Related to this, A3 made the following explanation. "*I think technology supports instructional activities to a great extent. I believe success and motivation will increase when technology is used effectively in educational environments. This will also be a benefit on academic success.* " In addition, academicians also added that using technology makes it easy to access information in terms of education at any time and makes life easy as much as possible.

Table 20
Academicians' Opinions About the Ease of Use of Instructional Technologies

Theme	f
Not too difficult	10
Difficulty of use in terms of technical problems	6
Not difficult if individuals make an effort	5
The fact that technology gets easier provides ease of use	2
In-service and pre-service education should be provided	2

Majority of academicians explained that they did not find it too difficult to use instructional technologies, and that they can use them easily. About using such technologies in classrooms, A5 said, "*I use instructional technologies easily in my classrooms. I use many science materials, projection, and many programs in computer*." While some of the academicians mentioned that they sometimes had difficulty because of technological problems, the others claimed that using technology was not difficult, but required some effort and interest to use easily.

Table 21
Academicians' Opinions About the Use of New Generation Technologies (Social Network, Smart Board, Smart Phone, Tablet PC., etc.) in Education

Theme	f
Using new generation technology in education is useful	9
Social networks are useful when they are used appropriate to their purpose	7
New generation technologies are useful, but they should be used appropriately	6
Making communication easier	5
Opportunity and education on new generation technology should be provided	2
It is very effective for individuals with special needs	1

Having positive opinions about new generation technologies, academicians explained that using these technologies, which provide learning opportunities anywhere, in education would be useful in any aspect. Related to this, ÖE3 said, "Using such environment and tools are useful for both academicians and students." Academicians explained that social networks, which were used to communicate, send files, discuss opinions, etc., would be useful when they were used appropriate to their purpose. While some of the academicians talked about the ease of communication, the others emphasized the need to provide training and moral and material support to supply and use new generation technologies. Furthermore, A11 made the following explanation about the benefits of new generation technologies for individuals with special needs. "*Technology is the place to provide equality in both certain environments and platforms. Many obstacles are removed with the use of technology by individuals with special needs in an active way. Thus, I think we, as special need educators, are one of the most actively technology using groups.* "

Discussion, Conclusion and Implications

The results of this study show that individual innovativeness scores of academicians are at high levels of innovativeness. The interviews with academicians also support this idea in that majority of them explained that they would try new solutions and be open to innovations. Related to this, Demiralay, Bayır, and Gelibolu (2016) emphasized the view that individuals, whose innovativeness were at high levels, would not be shy in trying innovations and consider innovations as useful and important. Different from these views, elementary school teachers were identified as having medium-level innovativeness (Demir Başaran, & Keleş, 2015; Öztürk & Summak, 2014) while their individual innovativeness characteristics were found to be at low levels (Kılıç & Ayvaz

Tuncel, 2014). The difference between teachers and academicians might be explained from the fact that academicians do more research, more interrogation, and are open to innovations because of their job.

According to the quantitative data in this study, individual innovativeness characteristics of majority of academicians were at “Early Adapters” category. Qualitative data support this notion in that interviews with academicians showed that they were more inclined to be leaders at accepting a new idea, event, or object. This is crucial because innovative and leader teachers at educational institutions help to expand technology in educational institutions and to form a technology culture among students (Kılıçer, 2008). Similarly Çoklar and Özbek (2017) emphasized that the great majority of teachers are in the categories of "early majority" and "early adapters" of the individual innovativeness levels. While the results of the data shows some similarities with the results of other studies in the same field (Yılmaz & Bayraktar, 2014), the results also conflict with the results of some studies (Argon, İsmetoğlu, & Yılmaz, 2015; Demircioğlu, Yavuz Konokman, & Akay, 2016; Gökçearslan, Karademir, & Korucu, 2017; Öztürk & Summak, 2014; Şahin & Thompson, 2006; Timucin, 2009).

Although individual innovativeness characteristics of female academicians were higher compared to male academicians, this did not bring out any significant results in terms of individual innovativeness in general and gender variable at its sub-factors. According to this data, it is concluded that both male and female academicians have individual innovativeness characteristics at similar levels. While the results of the data shows some similarities with the results of other studies in the same field (Argon, İsmetoğlu, & Yılmaz, 2015; Şahin & Thompson, 2006), the results also conflict with the results of some studies (Akdeniz ve Kadı, 2016). It was also found that there were no significant results in terms of individual innovativeness in general and field of expertise variable at its sub-factors. This data showed that academicians in different fields of expertise have similar characteristics in terms of individual innovativeness, and that they did not have too many differences in their thoughts. The results of this data showed some similarities with the literature (Argon, İsmetoğlu, & Yılmaz, 2015). The findings of the study also showed that there were no significant results in terms of individual innovativeness in general and title variable at its sub-factors. This data might be explained in that all academicians have similar thoughts in terms of

individual innovativeness and its sub-factors. In addition, no significant results were found among individual innovativeness characteristics of academicians and the variable of technology use for occupational purposes and total score of innovativeness and its sub-factors. Thus, it might be discussed that using technology for occupational purposes is not a significant variable in terms of developing or maintaining individual innovativeness.

When instructional technology acceptance of academicians was analyzed, it was found that academicians had positive opinions about acceptance, perceived ease of use, and perceived usefulness of instructional technologies. Similarly, Vanderlinde and Braak (2011) emphasized that teachers had positive opinions about technology use and teachers' BIT competence and schools' vision toward BIT were powerful and Bolat, Aydemir and Karaman (2017), graduate students, who educated in distance education, towards mobile Internet use had positively attitudes. Qualitative and quantitative data in this study supported each other and showed that academicians had positive opinions about innovations and instructional technologies. Besides, majority of academicians' trying new solutions to solve a problem, having no difficulty in using instructional technologies, and using such technologies easily supported the aforementioned opinions.

This study also showed that there was no significant difference between gender variable and instructional technology acceptance of academicians and its sub-factors, perceived usefulness and perceived ease of use. While the results of this data showed some similarities with the literature (Avcu & Gökdaş, 2012; Cheng, Chen, & Yen, 2015), the results also conflict with the results of some studies (Sanchez-Franco, 2006). It was found that there was no significant difference between instructional technology acceptance of academicians and its sub-factor, field of expertise. There are samples from the literature that has similarities with the results of this data (Avcu & Gökdaş, 2012). This might be explained with the similarity of perceived ease of use and perceived usefulness that belong to instructional technology use of academicians in every discipline. No significant difference was found between title variable and instructional technology acceptance of academicians. This might be explained with academicians' having similar perceptions towards instructional technology use regardless of title. On the other hand, there was a significant relationship between the variable of occupational technology use and instructional technology acceptance of academicians. This might be explained in that individuals, who always use

technology for occupational purposes, understand perceived ease of use and perceived usefulness of using such technologies more and consider them more seriously than individuals, who use them sometimes and rarely. About the contributions of instructional technologies to education, the interviews with the participants also revealed that instructional technologies provide ease of accessing information, help applications, provide visual and auditory contributions, and save time. Besides, academicians explained that they did not have too much difficulty in using instructional technologies in their classes and sometimes had problems because of technical issues. They further added that these problems would be overcome with in-service and pre-service training. Similarly, Ntemana and Olatokun (2012) suggested giving in-service training about expanding the use of BIT and using it efficiently. On the other hand, academicians discussed that simplified technology use provide ease for themselves. About using new generation technologies in education, academicians explained that using new generation technologies was useful, that they would provide more benefit if they were used appropriate to their purpose, that they provide ease at communication, and that they were important for the education of individuals with special needs.

Some of the reasons why innovation and instructional technology acceptance do not improve are the lack of source and money, not supporting educators in their studies enough, the lack of infrastructure of institutions such as information and application, administrators' keeping themselves away from innovations and change, educators and students' not being open to innovations, not providing the necessary in-service training, not understanding the relationship between technology and education, not providing enough collaboration between universities and industries, and societies' cultural and social structure (Kılıçer, 2008; Kılıçer & Odabaşı, 2010). Similarly, Wejnert (2002) emphasized that individuals' reactions towards innovations might change related to the cultural and belief systems that they are in and asserted that social culture is one of the obstacles in front of innovations. In spite of all these obstacles, educators are the most important individuals to improve the phenomenon of innovativeness. Innovative academicians might do cultural and social activities such as conferences, seminars, etc. to inform other academicians and teacher candidates about the benefit of using instructional technologies in education and the necessity of innovation and change in this information age. Related to this, Yavuz Konokman, Yokuş and Yanpar Yelken (2016) discussed that academicians should be innovative and integrate innovative instructional applications that were technology-centered into the learning

and teaching process to develop visions of teacher candidates, who would educate innovative individuals. Besides, it might be suggested that institutions should adopt an innovative perception and make smart classes comprised of new generation technologies to use instructional technologies more efficiently. It might also be suggested that academicians should share the results and impacts of any academic studies that includes technology and innovations. This study also has some limitations. One limitation is that academicians that are in this sample make evaluations based on their personal perceptions about individual innovativeness and instructional technology acceptance. Thus, it is necessary to conduct this study with other various samples and compare the results to generalize the results of this study.

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