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Examining the Relationship between Individual Innovativeness and Digital Nativeness Levels of Teachers

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Abstract

It is thought that individuals who are open to innovation and development will have no difficulty in adapting to digital life. The aim of this study is to determine individual innovativeness and digital nativeness levels of teachers and to reveal the relationship between these two variables. Correlational survey model was used in the research. The research was carried out on 815 teachers working in state secondary schools in Turkey in 2018. Within the scope of the research, a questionnaire was applied to the teachers to collect their levels of personal innovativeness and digital nativeness and their personal information. According to the data obtained from the research, it can be said that both individual innovativeness and digital nativeness levels of male teachers are higher than female teachers. It was found that the levels of digital nativeness of IT teachers were higher than Mathematics, Turkish, Fine Arts and Religious Culture and Moral Education teachers. As a result of the analysis, it was found that there is a positive and moderate relationship between digital nativeness and individual innovativeness. It is concluded that individual innovativeness is a significant predictor of digital nativeness and that dimensions of individual innovativeness explain 26% of digital nativeness.

Keywords

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Introduction

Globalization, which is one of the characterizing fundamental concepts of our age, has led to transformation not only in economic but also in sociological field with rapid developments in scientific and technological fields (Albrow, Eade, Washbourne, & Durrschmidt, 1994; Khondker, 2004; Moore, Kleinman, Hess, & Frickel, 2011). In consequence of information technologies becoming widespread and easily available, these technologies became an indispensable element of daily life and in the last quarter of 1900, they were encountered almost everywhere with the concept of "digital" (Belanger & Crossler, 2011; Eshet, 2004; Moursund & Bielefeldt, 1999). Children born into rich technological opportunities in these years have been exposed to technological stimuli more than their parents, who formed the agricultural society and then the first generation of the industrial society, have ever been in their lives, and a new generation which is described as "digital native" has emerged with all its positive and negative aspects (Bennett, Maton, & Kervin, 2008; Bilgiç, Duman, & Seferoğlu, 2011; Kurt, Günüç, & Ersoy, 2013; Prensky, 2001). Contrary to previous generations, digital natives who integrate information technologies with their cognitive, affective and psychomotor fields seem to use technology

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in their socialization processes as well. Individuals of this age group have readapted their attention, motivation, perception and similar features due to intensive use of information technologies according to the rapid flow of digital life and made them suitable for the age in cognitive and social contexts.

Perhaps, the most important issue for digital natives is the technological developments that have become almost difficult to follow for an ordinary individual (Lei, 2009; Vodanovich, Sundaram, & Myers, 2010). It is so much that, some new software, a new hardware or new ideas emerging almost every day have made the concept of innovativeness indispensable for digital natives (Ebermann, Piccinini, Busse, Leonhardt, & Kolbe, 2016). It is almost impossible or inefficient to realize the learning needs of digital natives who see information technologies as an indispensable part of their lives in traditional schools of the industrial age and with traditional approaches. It would not be wrong to describe digital natives as potential innovators in a constant need for learning. On the other hand, it is clear that traditional learning-teaching processes and approaches may be inadequate for digital natives with a highly dynamic cognitive structure (Arabacı & Polat, 2013; Ardıç & Altun, 2017; Gu, Zhu, & Guo, 2013). Limited social interaction, inadequate teaching technologies infrastructure, teachers who could not adapt to or resist digital culture, a non-innovative school climate and, schools far from supporting the innovative dynamic structures of digital natives appear to be far from meeting even the basic expectations of these individuals. In this case, it has become a necessity to exhibit contemporary approaches in line with the expectations and needs of a generation called as digital native in our country's education system, which consists of schools and students with various differences, both in terms of external variables such as socio-economic level and infrastructure, and individual factors such as gender, learning preferences and habits. In this context, digital native and individual innovativeness concepts are discussed according to various variables (gender, branch and seniority in the years) and the relationship between these two concepts is tried to be put forward with a scientific point of view in the study.

Individual Innovativeness

Innovation is defined as any object, practice or idea that is perceived as new by someone (Rogers, 2002). Rogers (2002) states that "relative advantage", "compatibility", "complexity", "trialability" and "observability features describe the adoption rate of innovation. Relative advantage is the perception that innovation is superior to its predecessors; compatibility is the innovation that is consistent with past experience, existing value and possible future requirements; complexity is the perception of innovation as difficult to understand and use; trialability is the experimentability of innovation in a limited way, and observability is the degree to which the results of innovation are seen by others (Rogers, 2002).

Innovativeness can be defined as a personal familiarity to something new or a personal reaction to innovation specific to a field (Van Braak, 2001). On the other hand, individual innovativeness is the situation in which an individual tries and adopts innovation earlier than the individuals in the society. According to Rogers (2002), the innovativeness states of individuals show normal distribution among the society and can be handled in five categories as “Innovators” (2.5%), “Early Adopters” (13.5%), “Early Majority” (34%), "Late Majority” (34%) and “Laggards” (16%). Rogers, describes Innovators as individuals who like trying new ideas; describes Early Adopters as individuals guiding other members of society about innovations; describes Early Majority as individuals who are cautious towards innovation; explains Late Majority as individuals who expect the majority of society to adopt innovation and describes Laggards as individuals biased towards change and tend to adopt them the latest (Kılıçer & Odabaşı, 2010). Innovators and Early Adopters are expected to adopt and use an innovation before Early Majority, Late Majority and Laggards. Sun and Jeyaraj (2013) stated that Innovators and Early Adopters consider themselves to be innovative or have sufficient experience and that the decision to adopt an innovation at an early stage may be due to the features of the individual and innovation.

It is thought that gender, professional seniority, working area and similar variables may influence the adoption of innovation. When the literature is studied, in most of the studies carried out in Turkey, individuals were from the "Early Majority category of innovativeness (Aslan & Kesik, 2018; Çetin & Bülbül, 2017; Çuhadar, Bülbül, & Ilgaz, 2013; Özgür, 2013) and in some studies, they were “Early Adopters” (Akgün, 2017; Atçı, Kale, & Şeker, 2017; Yapıcı, 2016; Yılmaz & Bayraktar, 2014). There are

studies revealing that individual innovativeness levels do not differ according to gender (Akgün, 2017; Aslan & Kesik, 2018; Çuhadar et al., 2013; Demir Başaran & Keleş, 2015; Kert & Tekdal, 2012; Korucu & Olpak, 2015; Özgür, 2013; Rogers, 2003; Rogers & Wallace, 2011; Yenice & Yavaşoğlu, 2018), as well as studies showing that individual innovativeness levels vary according to gender (Demirsoy, 2005; Ertuğ & Kaya, 2017; Gür-Erdoğan & Zafer-Güneş, 2013; McQuiggan, 2006; Shim & Kotsiopulos, 1994; Turhan, 2009). There are findings that the individual innovativeness levels do not differ according to the study area (Adıgüzel, Kaya, Balay, & Göçen, 2014; Kılıç & Ayvaz Tuncel, 2014; Örün, Orhan, Dönmez, & Kurt, 2015) in the literature. In addition, there are findings showing that the individual innovativeness levels of the new teachers and the old ones in the profession do not change (Çetin & Bülbül, 2017; Çoklar, 2012; Demir Başaran & Keleş, 2015), as well as findings showing the individual innovativeness levels of those who has just started the profession are higher than that of senior teachers (Aslan & Kesik, 2018; Atalay, 2018; Kocasaraç & Karataş, 2017). The different findings suggest that this issue should be re-investigated in detail.

Digital Native Generation

The use of digital technologies, in which individuals can do their jobs they need to do, faster, safer and more easily, has become a necessity rather than being an option in today's social life. Knowledge and/or attitudes of individuals to use these digital technologies can vary according to some characteristics such as gender (Ahuja & Thatcher, 2005; Ardies, Maeyer, Gijbels, & Keulen, 2015; Arrosagaray, González-Peiteado, Pino-Juste, & Rodríguez-López, 2019; Cai, Xitao, & Jianxia, 2017; Pierce & Ball, 2009; Teo, Fan, & Du, 2015) and their ages (Arrosagaray et al., 2019; Hart, Chaparro, & Halcomb, 2008; Siddique, 2012; Wagner, Hassanein, & Head, 2010). Different naming can be made according to the state of individuals' use of digital technologies.

"Digital Natives", who speak the language of information technologies as "native speakers" and who are born after 1980, are used to receiving information really fast. They like to parallel process and multi-task. They prefer their graphics before their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards. They prefer games to “serious” work (Prensky, 2001). Kesharwani (2020) stated that digital natives preferred online conversations instead of e-mail, instant messaging instead of talking on the phone for communication, unlimited and frequent sharing of daily life instead of limited and rare sharing of very important things in sharing information, creating also online contents instead of reaching them, using the technology for organizing and interacting.

Prensky (2001) states that there may be a distinction between the "digital immigrants" who were born before 1980 and the “digital natives, just like the difference between a native speaker and a foreign language learner. Helsper and Eynon (2010) stated that the level of digital nativeness is more related to the breadth of use, experience, digital self-efficacy and education just as, if not more, important than age in explaining how people become digital natives, and if this case is determined only by age, the digital connection between adults and young people will be cut off. It is also said that digital nativeness is not a common feature shared by all young people (Bennett & Maton, 2010; Thinyane, 2010).

No significant difference was found in some studies related to the digital nativeness status of individuals by gender (Akçayır, Dündar, & Akçayır, 2016; Karaoğlan Yılmaz & Binay Eyüboglu, 2018; Teo, Kabakçı Yurdakul, & Ursavaş, 2016). In some studies, on the other hand, data related to men being more digital native than women were obtained (Çukurbaşı & İşman, 2014; Kesharwani, 2020; Toraman & Usta, 2018). Karaoğlan Yılmaz and Binay Eyüboğlu (2018) also reported that young people bear more digital native features than adults.

It is thought that the criterion of being a digital native comes from the meaning attributed to technology and the habit of using technology. Based on the definition of Prensky (2001), Teo (2013) developed a scale by examining the status of being digital native in four dimensions as: “grew up with technology”, “comfortable with multitasking”, “reliant on graphics for communication”, and “thrive on instant gratifications and rewards”. Instead of classifying individuals as “digital native” or “digital immigrant, it is thought that determining their level of being a digital native would be a more accurate measurement and a more accurate approach.

It is seen that studies of digital nativeness are often carried out on young people such as students or teacher candidates (Bennett ve Maton, 2010; Çukurbaşı & İşman, 2014; Kennedy, Judd, Churchward, Gray, & Krause, 2008; Lei, 2009; Margaryan, Littlejohn, & Vojt, 2011; Teo, 2013; Teo et al., 2016; Thinyane, 2010; Toraman & Usta, 2018). Those born in 1980 have begun to turn 40 years old today. Even though students were called digital natives and teachers were called digital immigrants in 2013 (Arabacı & Polat, 2013), there were digital native teachers who started to work in the intervening years. The Annual Activity Report of the Ministry of National Education (2018) states that approximately 60% of teachers are under the age of 40. If the level of being digital native of the teachers is determined, they can be given in-service trainings on how to prepare teaching environments for their students who are digital natives and it can contribute to the ideas for pre-service trainings. It is also thought that conducting research on individual innovativeness and digital nativeness can raise awareness among researchers, politicians, teachers and students, and encourage them on entrepreneurship.

Purpose of the Study

The aim of this study is to determine the individual innovativeness and digital nativeness levels of teachers and to reveal the relationship between these two variables. With this aim, answers to the following questions were sought.

1. What are the individual innovativeness levels of teachers and do they differ according to their gender, branch and seniority in the years of teaching profession?
2. What are the digital nativeness levels of teachers and do they differ according to their gender, branch and seniority in the years of teaching profession?
3. Is there a relationship between the levels of individual innovativeness and digital nativeness of teachers?

Method

Research Model

The research was designed in correlational survey model. The correlational survey model is used for determining the relationship and the level of the relationship between two or more variables (Creswell, 2003). No intervention was made to the group in which the research was conducted and the current situation was tried to be described as it is. In this research, individual innovativeness and digital nativeness levels of the teachers were determined and compared according to gender, branch and seniority years in the teaching profession, and the relationship between these two variables were revealed.

Sample of the Research

The sample of the study consisted of 815 randomly selected teachers working in state secondary schools of the provinces selected from different regions in 2018. The data related to the teachers forming the sample are given in Table 1.

Table 1. Demographic Data of the Teachers Participating in the Study

Variables	Groups	f	%
Gender	Female	451	55.3
	Male	364	44.7
Branch	Mathematics and Science	196	24.0
	Turkish and Social Studies	142	17.4
	Fine Arts	99	12.1
	Information Technologies	85	10.4
	Religious Culture	99	12.1
	Foreign Language	100	12.3
	Guidance	94	11.5
Years of Seniority	0-1 year	163	20.0
	2-9 years	218	26.7
	10-17 years	160	19.6
	18-25 years	173	21.2
	26 years and over	101	12.4
Total		815	100

As shown in Table 1, 451 (55.3%) of the teachers were female and 364 (44.7%) were male. In order to facilitate the data analysis and interpretation, grouping method was applied for the related branches. Mathematics and Science, Turkish and Social Studies, Visual Arts and Music branches formed groups among themselves. These branches are also under the same department in the faculties of education. While 381 (46.7%) of the participants in the research were in their first 10 years in the profession, 333 (40.8%) had 10-25 years of experience in their profession.

Data Collection Tools

Individual Innovativeness Scale, Digital Native Assessment Scale and the personal information form developed by the researcher were used in order to collect data.

Individual Innovativeness Scale: It is a scale that can be used to determine the innovativeness levels and innovativeness categories of individuals. The scale, originally developed by Hurt, Joseph, and Cook (1977) and adapted to Turkish by Kılıçer and Odabaşı (2010), has a 5 point likert structure of 20 items. The scale has four dimensions: "resistance to change", "opinion leadership", "openness to experience" and "risk taking". The variance explained by these dimensions about the quality measured by the scale is 52.52%. The variance explained by the first dimension was 16.67%, the variance explained by the second dimension was 13.61%, the variance explained by the third dimension was 12.97% and the variance explained by the fourth dimension was 9.28%. In the "resistance to change" dimension which consists of eight negative items, there are items reflecting individuals' thoughts about innovation and changes such as "I am sceptical of new inventions and new ways of thinking." In the "opinion leadership" dimension, which consists of five items, there are items reflecting the situation of individuals leading the groups they are in such as "My friends often refer to me for suggestions or information". In the dimension of "openness to experience", which consists of five items, there are items reflecting individuals' thoughts about experiencing innovations such as "I like trying new ideas". In the dimension of "risk taking", which consists of two items, there are items reflecting the thoughts of individuals about the uncertainties they may encounter such as "Uncertainties and unresolved problems motivate me". The internal consistency coefficient for the overall scale was .82 and the test-retest reliability was .87. Individuals can be classified as "Innovator" if their score is higher than 80, "Early Adopter" if their score is between 69-80, "Early Majority" if their score is between 57-68, "Late Majority" if their score is between 46-56 and "Laggard" if their score is lower than 46. In addition, if the score of an individual is lower than 64, it can be interpreted as low in innovativeness while if it is higher than 68 he/she can be evaluated as innovative.

Digital Native Assessment Scale: It is a scale that can be used to determine the digital native levels of individuals. The scale, originally developed by Teo (2013) and adapted to Turkish by Teo et al. (2016), has a seven point likert structure of 21 items. The scale has four dimensions: "grew up with technology", "comfortable with multitasking", "reliant on graphics for communication" and "thrive on instant gratifications and rewards". The lowest score that can be obtained from the scale consisting of all positive items is 21 and the highest score to be taken is 147. The lowest average score that can be get by dividing the scores from the scale to the number of items is 1 and the highest average score is 7. In the dimension of "grew up with technology" which consist of five items, there are items reflecting the daily habits of individuals using computers and internet, such as "I communicate with my friends every day through computer". In the dimension of "comfortable with multitasking" which consist of six items, there are items reflecting the habits of individuals to perform other technologically-based tasks while using a technological device, such as "When talking to a friend on the phone, I can send a message to another friend at the same time". In the dimension of "reliant on graphics for communication" which consists of five items, there are items reflecting the habits of individuals to use visual elements instead of plain text in the case of communication with an element, such as "I use pictures rather than words when I want to explain something". In the five-item dimension of "thrive on instant gratifications and

reward", there are items reflecting the requests of individuals to respond and receive immediate feedback to their behaviours, such as "When I send an e-mail, I expect an immediate response".

Personal Information Form: In this form developed by the researcher, teachers were asked to mark their gender, branches and seniority years in the teaching profession.

Data Analysis

The data collected within the scope of the research were first transferred to computer. Inaccurate or incomplete data forms, identified as inappropriate for the purpose of the study, were excluded from the scope of the study. After the incorrectly entered data in the data form was determined and corrected, the data form was made ready for analysis. In data analysis, firstly, the data was examined whether they showed normal distribution. Since the calculated kurtosis and skewness coefficients were between -1.5 and +1.5, the data were accepted to be normally distributed (Tabachnick & Fidell, 2013). Descriptive statistics were carried out to determine the levels of individual innovativeness and digital native levels of the teachers. Independent sample t test was used to determine the differentiation status of teachers' individual innovativeness and digital nativeness levels according to gender; One-way analysis of variance was used to determine the differentiation status according to branch and seniority years. As a result of the analyses, in cases, where statistical differences are found, the degree of difference is determined by calculating the effect size of eta-square (η^2). In addition, Bonferroni correction was made to control type I error in one-way analysis of variance (ANOVA). Pearson correlation and multiple regression analyses were applied to reveal the relationships between teachers' individual innovativeness and digital nativeness levels.

Results

Within the scope of the research, findings related to the individual innovativeness and digital nativeness variables of teachers and the relationship between them were revealed.

Findings Related to Teachers' Individual Innovativeness Levels

The mean and standard deviation values of the teachers' individual innovativeness levels were examined in the research. The findings are presented in Table 2.

Table 2. Findings Related to Individual Innovativeness Levels of Teachers

Variables	n	Number of Items (k)	Mean	Mean/k	SD
Resistance to change	815	8	26.40	3.30	5.99
Opinion leadership	815	5	18.08	3.62	3.54
Openness to experience	815	5	19.87	3.97	3.58
Risk taking	815	2	7.03	3.52	1.78
Individual Innovativeness	815	20	71.39	3.57	9.81

As seen in Table 2, it can be said that the individual innovativeness characteristics of teachers are in the "early adopters" category according to the evaluation criteria created by the scale developers. Since the number of the items in the sub-dimensions of the individual innovativeness scale was different, the average of each sub-dimension was divided by the number of items and a new average score was created. When these scores are compared, it can be seen that the highest mean score belongs to the "openness to experience" factor ($\bar{x}$=3.97); and the lowest mean score belongs to the "resistance to change" factor ($\bar{x}$=3.30).

In the study, independent t-test was used to determine whether the individual innovativeness levels of the teachers changed according to their gender. The analysis result is presented in Table 3.

Table 3. Comparison of Teachers' Individual Innovativeness Levels by Gender

Variable	Gender	n	Mean	SD	df	t	p
Resistance to change	Female	451	26.65	5.59	813	1.32	.19
	Male	364	26.09	6.45			
Opinion leadership	Female	451	17.55	3.66	813	4.83	.00
	Male	364	18.73	3.27			
Openness to experience	Female	451	19.47	3.88	813	3.57	.00
	Male	364	20.37	3.10			
Risk taking	Female	451	6.79	1.83	813	4.19	.00
	Male	364	7.32	1.68			
Individual Innovativeness	Female	451	70.48	9.86	813	2.95	.00
	Male	364	72.51	9.63			

When Table 3 is examined, it can be said that individual innovativeness levels of male teachers are significantly higher than female teachers (t=2.95; p <.05). Also, it can be said that male teachers' levels of "opinion leadership", "openness to experience" and "risk taking" sub-dimensions of individual innovativeness levels, are higher than female teachers (t=4.83; t=3.57; t=4.19; p<.05). However, it is seen that levels of "resistance to change" sub-dimension of individual innovativeness levels of teachers do not differ statistically according to the gender (t=1.32; p>.05).

The status of teachers' individual innovativeness levels by branches are presented in Table 4.

Table 4. Status of Teachers' Individual Innovativeness Levels by Branches

Branches	n	Mean	SD
1. Mathematics and Science	196	71.05	9.06
2. Turkish and Social Studies	142	71.65	9.68
3. Fine Arts	99	68.83	10.95
4. Information Technologies	85	73.12	11.22
5. Religious Culture	99	72.46	10.57
6. Foreign Language	100	71.87	9.63
7. Guidance	94	71.18	7.72

When the findings are examined, it can be seen that Information Technology ($\bar{x}$=73.12) is the branch with the highest average and Fine Arts ($\bar{x}$=68.83) is the branch with the lowest average. One-way analysis of variance was used to determine whether there was a significant difference between the individual innovativeness levels of teachers according to their branches. Table 5 was obtained as a result of the analysis.

Table 5. Comparison of Individual Innovativeness Levels of Teachers by Branches

Source of Variance	Sum of Squares	df	Mean Square	F	p	Source of difference
Between groups	1077.35	6	179.56			
Within groups	77192.35	808	95.54	1.88	.08	-
Total	78269.70	814				

It can be said that individual innovativeness levels of teachers do not show statistically significant difference according to their branches (F=1.88; p>.05).

The individual innovativeness levels of teachers according to their seniority years are shown in Table 6.

Table 6. Status of Individual Innovativeness Levels of Teachers According to Their Seniority Years

Years of Seniority	n	Mean	SD
1. 0-1 year	163	71.99	10.54
2. 2-9 years	218	72.56	9.43
3. 10-17 years	160	70.76	9.87
4. 18-25 years	173	72.04	8.11
5. 26 years and over	101	67.76	11.11

When the findings are examined, it is seen that the teachers with 2-9 seniority years ($\bar{x}$=72.56) have the highest average level of individual innovativeness and the teachers who have been teaching for more than 25 years ($\bar{x}$=67.76) have the lowest average. One-way analysis of variance was used to determine whether there was a significant difference between the individual innovativeness levels of teachers according to their seniority years. Table 7 was obtained as a result of the analysis.

Table 7. Comparison of Teachers' Individual Innovativeness Levels According to Their Seniority Years

Source of Variance	Sum of Squares	df	Mean Square	F	p	Source of difference	Effect size
Between groups	1824.14	4	456.03			1-5*	
Within groups	76445.57	810	94.38	4.83	.00	2-5*	.02
Total	78269.71	814					

1. 0-1 year, 2. 2-9 years, 3. 10-17 years, 4. 18-25 years, 5. 26 years and over

Bonferroni correction was made before the multiple comparison (post-hoc) test to determine between which groups the difference occurred according to the results of the analysis. Bonferroni value was found to be 0.005 since there were 10 comparisons (5 groups) in terms of seniority year variable. It can be said that individual innovativeness levels of teachers differ statistically according to their seniority years in profession (F=4.83; p<.005). Scheffe test was carried out due to the homogeneity of the groups in order to determine teachers' individual innovativeness levels differ among which seniority years, to keep the margin of error under control in more than two group comparisons and the number of teachers in groups being not equal. As a result of the analysis, it can be said that teachers who have been teaching for less than 10 years have higher levels of individual innovativeness than those who have been teaching for more than 25 years. When the eta-square value of the individual innovativeness scale is analyzed, it can be seen that the effect size (η^2 = .02) is small in terms of the seniority year in the profession variable.

Findings Related to Teachers' Digital Nativeness Levels

In this research, mean and standard deviation values regarding digital nativeness levels of teachers were examined. The findings are presented in Table 8.

Table 8. Findings on Digital Nativeness Levels of Teachers

Variables	n	Number of Items (k)	Mean	Mean/k	SD
Grew up with technology	815	5	26.32	5.26	7.36
Comfortable with multitasking	815	6	28.71	4.78	9.86
Reliant on graphics for communication	815	5	19.75	3.95	7.70
Thrive on instant gratifications and rewards	815	2	24.46	4.89	6.53
Digital Nativeness	815	21	99.24	4.73	25.11

Since the number of items in the sub-dimensions of the digital native assessment scale was different, the average of each sub-dimension was divided by the number of items and a new average score was created. When these scores were compared, it can be seen that the highest mean score belongs to the "grew up with technology" factor ($\bar{x}$=5.26); and the lowest average score belongs to the "reliant on graphics for communication" factor ($\bar{x}$=3.95).

T-test was used for independent samples in order to determine whether the teachers' digital nativeness levels changed according to their gender in the study. The result of the analysis is presented in Table 9.

Table 9. Comparison of Teachers' Digital Nativeness Levels by Gender

Variables	Gender	n	Mean	SD	df	t	p
Grew up with technology	Female	451	5.02	1.54	813	5.30	.00
	Male	364	5.56	1.32			
Comfortable with multitasking	Female	451	4.55	1.60	813	4.54	.00
	Male	364	5.07	1.66			
Reliant on graphics for communication	Female	451	3.85	1.44	813	2.04	.00
	Male	364	4.07	1.66			
Thrive on instant gratifications and rewards	Female	451	4.71	1.28	813	4.51	.00
	Male	364	5.12	1.30			
Digital Nativeness	Female	451	4.53	1.16	813	5.15	.00
	Male	364	4.96	1.20			

When Table 9 is examined, it can be said that male teachers' digital nativeness levels are higher than female teachers (t=5.15; p<.05). In addition, it can be said that male teachers' levels of "grew up with technology", "comfortable with multitasking", "reliant on graphics for communication" and "thrive on instant gratifications and rewards" sub-dimensions of digital nativeness levels are higher than female teachers (t=5.30; t=4.54; t=2.04; t=4.51; p<.05).

Table 10 shows the status of teachers' digital nativeness levels by branches.

Table 10. Status of Teachers' Digital Nativeness Levels by Branches

Branches	n	Mean	SD
1. Mathematics and Science	196	4.96	1.16
2. Turkish and Social Studies	142	4.55	1.21
3. Fine Arts	99	4.31	1.36
4. Information Technologies	85	5.17	1.16
5. Religious Culture	99	4.64	1.28
6. Foreign Language	100	4.66	1.01
7. Guidance	94	4.62	.92

When the findings are analysed, it is seen that the branch that has the highest average is the Information Technology ($\bar{x}$=5.17) and the branch that has the lowest average is the Fine Arts ($\bar{x}$=4.31). One-way analysis of variance was used to determine whether there was a significant difference between teachers' nativeness levels and their branches. Table 11 was obtained as a result of the analysis.

Table 11. Comparison of Teachers' Digital Nativeness Levels by Branches

Source of Variance	Sum of Squares	df	Mean Square	F	p	Source of difference	Effect size
Between groups	59.05	6	9.84			4-2; 4-3	
Within groups	1104.35	808	1.37	7.20	.00	4-5; 4-7	.05
Total	1163.40	814				1-3	

1. Mathematics and Science, 2. Turkish and Social Studies, 3. Fine Arts, 4. Information Technologies, 5. Religious Culture, 6. Foreign Language, 7. Guidance

It can be said that digital nativeness levels of teachers differ statistically according to their branches (F=7.20; p<.05). Scheffe test was used to determine among which branches the digital native levels of teachers differed. As a result of the analysis, it can be said that the digital native levels of IT teachers are higher than Turkish and Social Studies, Fine Arts, Religious Culture and Guidance teachers.

In addition, it can be said that mathematics and science teachers have higher digital nativeness levels than Fine Arts teachers. When the eta-square value of the digital nativeness scale is analyzed, it is seen that the effect size (η^2 = .05) is small in terms of the branch variable.

Table 12 shows the status of teachers' digital nativeness levels according to their seniority years in profession.

Table 12. Status of Teachers' Digital Nativeness Levels According to Their Years of Seniority

Years of Seniority	N	Mean	SD
1. 0-1 year	163	4.92	1.07
2. 2-9 years	218	4.98	1.14
3. 10-17 years	160	4.76	1.18
4. 18-25 years	173	4.57	1.17
5. 26 years and over	101	4.07	1.32

When the findings are analysed, it can be seen that teachers with the highest level of digital nativeness are the ones with 2-9 seniority year in profession ($\bar{x}$=4.98) and the ones with the lowest average are the teachers who have been teaching for more than 25 years ($\bar{x}$=4.07). One-way analysis of variance was used to determine whether there was a significant difference between the digital nativeness levels of teachers according to their seniority years. Table 13 was obtained as a result of the analysis.

Table 13. Comparison of Teachers' Digital Nativeness Levels According to Their Seniority Years

Source of Variance	Sum of Squares	df	Mean Square	F	p	Source of difference	Effect size
Between groups	67.44	4	16.86				
Within groups	1095.95	810	1.35	12.46	.00	1-5; 2-5 3-5; 4-5	.06
Total	1163.39	814					

1. 0-1 year, 2. 2-9 years, 3. 10-17 years, 4. 18-25 years, 5. 26 years and over

Bonferroni correction was made before the multiple comparison (post-hoc) test to determine between which groups the difference occurs according to the results of the analysis. Bonferroni value was found to be 0.005 since there were 10 comparisons (5 groups) in terms of seniority year variable. It can be said that digital nativeness levels of teachers differ statistically according to their seniority years in profession (F=12.46; p<.05). Scheffe test was used to determine the level of digital nativeness of teachers differ among which seniority years. As a result of the analysis, it can be said that teachers who have been teaching for more than 25 years have lower levels of digital nativeness than teachers who have been teaching for less. When the eta-square value of the digital nativeness scale is analyzed, it can be seen that the effect size (η2 = .06) is medium in terms of the seniority year in the profession variable.

Findings Regarding the Relationship Between Individual Innovativeness and Digital Nativeness Levels

Correlation analysis was conducted to determine whether there is a significant relationship between the individual innovativeness levels and digital native levels of teachers. The data obtained from the analysis are presented in Table 14.

Table 14. Relationship between Individual Innovativeness with Its Sub-Dimensions and Digital Nativeness Levels

	Individual innovativeness	Resistance to change	Opinion leadership	Openness to experience	Risk taking
Digital Nativeness	.43**	.08*	.46**	.46**	.24**

* Correlation is significant at the .05 level.

** Correlation is significant at the .01 level.

As a result of the correlation analysis, it was determined that there is a positive and moderate relationship between the individual innovativeness and digital nativeness levels of teachers (r=.43; p<.01). In addition, a positive and moderate relationship between teachers' digital nativeness levels and the "opinion leadership" (r=.46; p<.01) and "openness to experience" (r=.46; p<.01) sub-dimensions of the individual innovativeness levels was determined. It was determined that there is a positive and very low level of significant relationship between teacher' digital nativeness levels and "risk taking" (r=.24; p<.01) and "resistance to change" (r=.08; p<.05) sub-dimensions of their digital innovativeness levels.

In addition, multiple regression analysis was conducted to determine the degree to which teachers' individual innovativeness predicts their digital nativeness, and the findings are presented in Table 15.

Table 15. The Results of Multiple Regression Analysis of the Power of Teachers' Individual Innovativeness to Predict Their Digital Nativeness Levels

	B	Std. Error	Beta	t	p
CONSTANT	.93	.27	-	3.47	.00
Resistance to change	.01	.01	.05	1.45	.15
Opinion leadership	.09	.01	.27	6.69	.00
Openness to experience	.09	.01	.26	6.00	.00
Risk taking	.03	.02	.04	1.19	.24

R= .51, R^2= .26, F= 69.71, p< .01

As shown in Table 15, individual innovativeness was found to be a significant predictor of digital nativeness (R=.51; R^2=.26; p<.01). According to these findings, the dimensions of individual innovativeness account for 26% of the digital nativeness. The standardized regression coefficients (β) show the order of importance of the predictive dimensions to explain the digital nativeness as "opinion leadership" (R^2=.27, p<.01), "openness to experience" (R^2=.26; p<.01), "resistance to change" (R^2=.05, p>.05) and "risk taking" (R^2=.04; p>.05). When the p values related to the significance of the regression coefficients were examined, it was found that the "opinion leadership" dimension (p<.001) and the "openness to experience" dimension (p<.01) were significant predictors of the digital nativeness, however, "resistance to change" (p>.05) and "risk taking" dimensions (p>.05) were not significant variables in predicting digital nativeness. The findings obtained should be explained with relevant tables, figures, graphics or pictures in a way that they support the aim and the problem of the study and preserve the integrity.

Discussion, Conclusion and Suggestions

In this research, it is aimed to examine the individual innovativeness and digital nativeness levels of teachers, and also to determine the relationship between individual innovativeness and digital nativeness. In the research, it was determined that the individual innovativeness characteristics of teachers were in the "Early Adopters" category. Although most of the studies found that individuals were from the "Early Majority" (Aslan & Kesik, 2018; Çetin & Bülbül, 2017; Çuhadar et al., 2013; Özgür, 2013) category of innovativeness, it can be seen in the majority of these studies that individual innovativeness scores or individual rates in the "Early Adopters" category were higher than the rate indicated by Rogers. Recently, the individual innovativeness category was also found to be "Early Adopters in some studies carried out on academicians (Akgün, 2017; Özdemir & Özer, 2018), teachers (Yapıcı, 2016; Yılmaz & Bayraktar, 2014) and hotel operators (Atçı et al., 2017) with high social status. Accordingly, it can be said that teachers provide information and guidance on innovations to individuals in the society they live in, in other words, they pioneer them. In the study, it can also be said that the teachers are generally digital natives. Accordingly, it can be considered that teachers can easily access and use information, prefer graphics instead of texts, create online contents and use technology for interaction.

In the study, it was examined whether the individual innovativeness characteristics of teachers varied according to the gender variable. According to the findings, individual innovativeness

characteristics of male teachers were higher than female teachers. In some studies in the literature, there are findings that show men are more innovative than women (Demirsoy, 2005; Shim & Kotsiopulos, 1994; Turhan, 2009); in some studies, women are more innovative than men (Ertuğ & Kaya, 2017; Gür-Erdoğan & Zafer-Güneş, 2013; McQuiggan, 2006) and in some studies, being innovative does not differ according to gender (Akgün, 2017; Aslan & Kesik, 2018; Çuhadar et al., 2013; Demir Başaran & Keleş, 2015; Kert & Tekdal, 2012; Korucu & Olpak, 2015; Özgür, 2013; Rogers, 2003; Rogers & Wallace, 2011; Yenice & Yavaşoğlu, 2018). The reason of the findings being different from each other can be said to have resulted from the characteristics of the samples. It is seen that studies showing no difference are carried out in the last decade, and performed on students and/or teacher candidates (new generation and close ages) (Çuhadar et al., 2013; Kert & Tekdal, 2012; Korucu & Olpak, 2015; Özgür, 2013; Rogers & Wallace, 2011; Yenice & Yavaşoğlu, 2018). When it is considered that women and men were given different status and duties in the society in the eighties and before, and approximately half of the participants in this study were born before these years, the individual innovativeness characteristics of male teachers can be expected different from female teachers. It is thought that individual innovativeness will not differ according to gender in the following years.

According to the findings of the study, the finding that teachers' individual innovativeness levels do not differ according to their branches shows similarity with the studies in the literature (Adıgüzel et al., 2014; Kılıç & Ayvaz Tuncel, 2014; Örün et al., 2015). It can be said that the individual innovativeness of teachers is high independent of their branches. This means that teachers can lead their students in educational and social transformation.

In addition, it has been found that the individual innovativeness levels of the teachers who have been employed in the profession for a short time are higher than the senior teachers. This finding shows similarity to some of the studies in the literature (Aslan & Kesik, 2018; Atalay, 2018; Kocasaraç & Karataş, 2017). Because Çetin and Bülbül (2017) and Çoklar (2012) collected data only from education managers in their studies, and Demir Başaran and Keleş (2015) collected data samples close to homogeneous in terms of seniority of the sample (approximately 82% of the sample is less than 15 years senior), they could not find any difference and/or relationship between teachers' individual innovativeness and their seniority. The fact that newly recruited teachers are more innovative than senior teachers gives individuals related with education hope for the future.

In the study, it was also found that the digital nativeness levels of male teachers were higher than female teachers. Some studies in the literature show that men are more digital native than women (Çukurbaşı & İşman, 2014; Kesharwani, 2020; Toraman & Usta, 2018). In some studies conducted on university students (Akçayır et al., 2016; Teo et al., 2016), it is seen that digital nativeness levels do not differ according to gender. This situation is thought to be due to the different status and duties of women and men in some communities in the old years. It is thought that the levels of digital nativeness will not differ according to gender in the following years.

According to the findings of the research, it was found that the level of digital nativeness of IT teachers was higher than other teachers. It can be said that this situation stems from the fact that the branches of IT teachers are intertwined with technology. In addition, that IT teacher training departments in Turkey (Computer Education and Instructional Technology) has been producing graduates since 2002 is a natural reason for the teachers working in this area to be digital natives. The Ministry of National Education' assigning some teachers working in this branch as Information Technology Guide Teacher is contributing to the leadership of these teachers to the ones in other branches for the use of technology.

In addition, it was found that the level of digital nativeness of teachers who are senior in their profession was lower than the others. Prensky (2001) associates digital nativeness with age and includes those born after 1980 to this group. Digital native teachers under the age of 40 are expected to contribute to the digital transformation of the teaching process.

The findings of the study revealed that there is a positive relationship between the individual innovativeness characteristics and digital nativeness of teachers. More specifically, it can be said that the higher the individual innovativeness levels of teachers are, the higher their digital nativeness levels are. Organizing activities to increase teachers' innovativeness can also contribute to their students' academic and social development.

As a result of this study, where individual innovativeness characteristics and digital nativeness levels of teachers were examined, it was seen that both variables had positive relations with each other. It is a pleasing finding that teachers are at the Early Adopters position at innovativeness. Considering the widespread use of technology in all areas in developed and developing countries and the major transformations that are expected to occur in the teaching processes, the innovativeness of teachers expected to guide future generations will contribute positively to this process. In addition, there is the fact that the education programs prepared without considering the instructional technologies are not suitable for today's children born within the technology. Digital native students, who see technology as a part of their lives, taking lessons from the new generation of digital native teachers who understand their language, will ensure us to look at the future positively. In particular, it may be suggested that senior teachers should be encouraged by the administrators on the widespread use of digital technologies. In this regard, if a working program is prepared for new generation teachers and senior teachers to work together, they can benefit from each other's experiences. This study was carried out within the framework of some limitations. In the research, teachers' evaluations for both concepts were revealed based on their individual perceptions, analyzed and interpreted. Qualitative research can be conducted by collecting data with interview and observation techniques in order to access more in-depth findings regarding perception and experiences. Within the scope of the research, data were collected only from secondary school teachers. Data collection from primary school and high school teachers may contribute to the generalization of the findings. Researches can be designed to determine the individual innovativeness and entrepreneurship levels of students who are trained by teachers with a high level of innovativeness and digital nativeness and other students.

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