

Research Article

## Investigation of Innovation Levels of Information Technologies Teacher Candidates

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**Abstract:** The rapid developments in information and technology necessitate teachers to develop and renew themselves, especially IT teachers. In this context, it is considered important to know the individual innovation levels of future IT teachers. The aim of this study is to reveal the individual innovation levels of prospective IT teachers and to determine whether individual innovation levels change according to their academic success. The study was conducted on 162 prospective teachers in 2018 at Necmettin Erbakan University Ahmet Keleşoğlu Faculty of Education Computer Education and Instructional Technologies Department. According to the results of the research, it was determined that the pre-service teachers were in the “early adopters” category. While there was no significant difference between the levels of individual innovation according to the academic achievement levels of the prospective teachers, it was found that those who had high academic achievement in technical courses were more innovative than those who were low.

**Keywords:** information technologies, innovation, teacher candidates.

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## INTRODUCTION

Rapid developments in science and technology can lead to major transformations in societies. In order for individuals or societies to keep up with this transformation, they need to keep themselves open to development and keep up with changes. This situation can be interpreted as individuals being open to innovation.

Technological developments that enable the emergence of innovation become the key to competing with countries that have reached the information age (Kılıçer, 2008). According to Johannessen (2013), innovation can be expressed as a new product or a new type of technology. The concept of innovation is defined as the degree of individuals' acceptance of innovation before other individuals in the society (Rogers, 1995), the characteristics of those who adopt innovation and their reactions to the innovations realized (Goldsmith & Foxall, 2003). Innovation is also accepted as a willingness to change and / or try new things (Agarwal and Prasad, 1998; Hurt, Joseph and Cook, 1977).

Rogers (2003) defines innovation as an idea, practice or object that society accepts as new. Individuals' levels of innovation may vary depending on the characteristics they carry. Rogers (2003) evaluated

the level of innovation of individuals by distinguishing them as being "Innovators", "Early Adopters", "Early Majority", "Late Majority" and "Laggards".

It is thought that teachers play an important role in the implementation of innovations in education. Ntemana and Olatokun (2012) emphasized that the university administration should be motivated to have a positive attitude towards the use of technology by providing the necessary trainings to the educators, in order to have innovative trainers for information and communication technologies. Çuhadar, Bülbül and Ilgaz (2013) and Yenice and Yavaşoğlu (2018) revealed that the pre-service teachers were in the "Early Majority" category in their studies with prospective teachers.

It is thought that it is important that children who are the future of societies are educated by teachers who are open to change and development so that they can keep up with innovations. In some areas, even though the information that teachers will teach to children does not change, the development of teachers is needed because their teaching methods and strategies change.. Since there are new developments in the field of informatics, it can be much more important for teachers working in this field to be open to change. It is thought that the prospective teachers who are the

teachers of the future are as important as the innovation status of the teachers. In this context, the purpose of this study is to reveal the individual innovation levels of IT teacher candidates and to determine whether the individual innovation levels change according to their academic success.

## METHOD

Survey model was used in the research. In this model, the current situation is tried to be described as it is without interfering (Karasar, 2006).

### Sample of the Study

The research was carried out on 129 prospective teachers studying at Necmettin Erbakan University Ahmet Keleşoğlu Faculty of Education, Department of Computer Education and Instructional Technologies in 2018. Demographic information of prospective teachers participating in the study is given in Table 1.

**Table 1.** Demographic information of prospective teachers

Variables	Groups	f	%
Gender	Female	70	54
	Male	59	46
Grade Level	1 <sup>st</sup> Grade	20	16
	2 <sup>nd</sup> Grade	35	27
	3 <sup>rd</sup> Grade	38	29
	4 <sup>th</sup> Grade	36	28
<b>Total</b>		129	100

As seen in Table 1, 54% of prospective teachers participating in the research are women. Since the number of students studying in the first year is low, only 20 first year students participated in the sample.

### Data Collection Tools

The scale, which was developed by Hurt, Joseph and Cook (1977) and adapted to the Turkish language by Kılıçer and Odabaşı (2010), was used as a five-point Likert-type Individual Innovation Scale. The scale consists of four dimensions: "resistance to change", "opinion leadership", "openness to experience" and "risk taking". According to the special calculation technique, the innovation categories of the individuals are determined according to the scores obtained from the scale. In the research, academic achievements in technical lessons were also collected from individuals.

### Data Analysis

A special statistical program was used in the analysis of the data. In the analysis of the data, besides descriptive statistics such as mean and standard deviation, independent sample t test was used to compare the groups. In the analysis process, the level of significance was accepted as 05.

## FINDINGS

Within the scope of the research, firstly, it was tried to determine which type of innovation students who are studying in the Department of Computer and Instructional Technologies Education, or also the information technology teacher candidates are in, and Table 21 was obtained.

**Table 2.** Innovation Status of Prospective Teachers

Variable	N	$\bar{x}$	SD
Individual innovation	129	67.89	14.28

When Table 2 is analyzed, it is seen that the average score of the information technology teacher candidates from the innovation scale is 67.89. As a criterion, the range of 57 to 68 points falls into the "Inquiry" category. In other words, it can be said that the innovation categories of information technology teacher candidates are "Early Majority". This finding is in line with the studies of Çuhadar, Bülbül and Ilgaz (2013), Çetin and Bülbül (2017) and Aslan and Kesik (2018) in the literature.

Within the scope of the research, IT teacher candidates were asked the midterm grade they received from the technical course of that period. Those with a score of 70 or higher are grouped high. Those with less than 70 points are grouped as low scores. The findings of both groups are given in Table 3.

**Table 3.** Comparison of Innovation Levels of IT Teacher Candidates According to Technical Course Achievements

Variable	Achievements	n	$\bar{x}$	SD	df	t	p
Individual innovation	Low score	78	65.71	13.97	127	2.28	.02
	High score	51	71.47	14.19			

According to the technical course success of the IT teacher candidates, the average of innovation points of the low achievement group, which includes 78 people, is 65.71 and 13.97 with the standard deviation. According to the technical course success of the IT teacher candidates, the average of innovation points of the high achievers group, which includes 51 people, is 71.47 and 14.9 with the standard deviation. Independent sample t test was performed to determine whether there is a difference between the groups ( $t = 2.28$ ;  $p < .05$ ). Accordingly, it can be said that the level of innovation of students who are highly successful in technical courses is higher than that of students who are low.

## CONCLUSION

As a result of the research, it was found that IT teacher candidates were in the "Early Adopters" category. The findings obtained in this study are similar to Çuhadar, Bülbül and Ilgaz (2013) and Yenice and

Yavaşoğlu (2018). It was found that the individual innovation levels of the IT teacher candidates who received high scores from the technical courses were higher than those who received low scores. Considering that it is important to increase the levels of innovation of IT teacher candidates, it can be said that it may be beneficial to organize activities to increase innovation in the related group. Innovation levels of prospective teachers, especially IT teacher candidates, were expected to be in the "Early Adopters" category. Studies can be designed to reveal the reasons for the innovation level to grow in the "Early Majority" category. This study was conducted under some limitations. The data analyzed consists of the individual perceptions of the IT teacher candidates. Qualitative research will be done to obtain in-depth information. Within the scope of the research, data was collected only from one institution. More extensive studies will be done on IT teacher candidates studying in different cities and universities.

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