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Position of twenty-first century teachers: evaluation in terms of innovation and technology

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Abstract

Innovation is the key not only for organization to survive but also for both organization and people to compete in information society. Thus, creative and innovative next generation is required indispensably. Therefore, teachers are required to teach creativeness and inventiveness to the next generation for the information society nowadays. In this framework, the purpose of the study is to evaluate the position of prospective teachers in terms of innovation and technology in terms of various variables. The results indicated that the students were largely innovators and students' traced innovations at an average level.

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1. Introduction

In the 21st century, the amount of information in the world is gradually increasing in parallel with the technological developments (UNESCO, 2002) and as a result of technology, access to information is becoming easier. Particularly along with the growth of Internet and increase of its use, the world becomes smaller and flat (Friedman, 2006). Individuals, institutions, and hence societies are in a rapid change as a result of need to keep up with the changing world. For institutions and societies, the only way to integrate to the changing situations and to compete in global markets seems to be innovation (Elçi, 2008). The innovation is defined as the application of new or modified product (goods or service) or process; a new marketing method; or the application of new organizational method in business practice, workplace organizations or foreign affairs (OECD Oslo Manual, 2006) and it is seen as prerequisite for creating social values in the 21st century.

These developments cause change to the structure of education institutions, to the qualities of the students, who will graduate from these institutions and the profiles of the students attending to these institutions. According to the results of study conducted by PISA in OECD countries in 2003, it was emphasized that the new generation encounters information and communication technologies and see them as indispensable parts of their daily lives. This new generation uses the digital technologies like visual media, computer, Internet and communication technologies intensely and their learning habits correspondingly vary. Since students encounter new technologies at early ages, their views to technology, aptness to technology, their skills of technology use, and their expectations are

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different in comparison with the previous generation (OECD, 2006). Thus, it is an undeniable fact that the prospective teachers who will graduate from the teacher training programs should serve to the features of new generation and requirements of the 21st century. In this context, the prospective teachers are expected to be receptive to change and to have lifelong-learning and high thinking skills, in short, to be innovative.

When examined in detail, it can be seen that the innovative individuals differ from other individuals in the society, with their socio-economic and communicative features (Rogers, 1995). However, it is apparently observed that the innovative individuals have some common features: They have strong skills of analyzing and interpreting. They can think on the events without prejudices, interpret the invisible relations and come up with a solution. Furthermore, they are open to change, and they have the skills to manage change. Discontenting with the current situation, they like coping with problems and troubles and searching. They can see the whole picture behind the events, think critically on them, and transfer the opinions and solutions to other events and situations. Innovative individuals keep on questioning without accepting the general assumptions embraced by the society. Their communication skills related to attaining and sharing information about innovations are strong, besides, they are the individuals that enjoy trying innovations, have high imagination and inventive personality (Rogers, 1995; Ha & Stoel, 2004; Sahin & Thompson, 2006).

However, according to Rogers (1995) individuals differ from each other in a society in terms of being innovative. When the individuals' adaptation to innovations is considered as a normal distribution curve, these individuals are considered on accepting innovations and change under five different categories, namely; the innovators who like trying out new ideas and taking risks and who have a vision, the pioneers who guide and inform the other individuals in the society about innovations, the interrogators who are deliberate and cautious against innovations, the skeptics who are reserved and suspicious about innovations, and the traditionalist who have prejudices against changes (Rogers, 1995; Uzokurt, 2008). Within these categories, the teachers are the pioneers who are models for the society and who guide and inform the society about innovations also, according to Rogers (1995), teachers comprise 13,5% of the society. In this context, the aim of this study is to evaluate the prospective teachers' level of innovativeness in terms of different variables

2. Method

The survey method was applied in this study to collect the research data. In line with the sub-goals, singular survey model was employed. For the analysis of the data, SPSS 15.0 was run, and the significance level was taken as .05.

2.1. Participants

The study was conducted at Faculty of Education in Anadolu University in the academic year of 2008-2009. The reason is that, the Faculty of Education has all departments which exist in Turkey in teacher education. The study was carried out on 206 final year undergraduate students attending 10 different teacher training programs of the Faculty of Education in Anadolu University. Three students were excluded from the study as they did not respond to the data collection tool as required. Since the focus of this study is the prospective teachers, only senior students were involved in the study.

26.2% of the participants were male and 73.8% of them were female. 74.8% of the participants had computers, and 25.2% of them did not. In terms of web sites, 88.8% of the participants did not have personal web sites, but 11.2% of them had personal web sites. 87.9% of the participants did not have Blog while 12.1% of them had Blogs. In terms of membership to social webs (forum, news group...), 65.5% of the participants are members of some social webs, yet 34.5% of them are not members to any group.

2.2. Instrument

The data collection instrument of the study was developed by the researchers considering the key characteristics of innovativeness person mentioned in the literature. The data collection instrument developed was made up of three parts. The first part of the instrument included statements about personal information, the second part comprised statements about characteristics of innovative personality and the third part of the instrument included level of

expertise and current use about technological innovation. The statements about innovative person were composed of as 5-item Likert type like “Strongly Disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly Agree”. Level of using technological innovations were composed of as 5-item Likert type like “None”, “Fair”, “Good”, “Very Good”, “Excellent”, and about frequency of using technological innovations were composed of as 5-item Likert type like “Not at all”, “Rarely”, “Sometimes”, “Often”, “Quite Often”. The data collection instrument was presented to the expert panel in order to determine construct and content validity. The expert panel consisted of people who were experts in the field of Educational Technology. Following the expert-feedback process, some of the items were changed. Furthermore, to determine the comprehensibility of the data collection instrument, the pilot study of the instrument was carried out with 5 graduate students. As a result of this pilot study, the incomprehensible statements in the instrument are rearranged. Following application, the reliability coefficient (Cronbach Alpha) of the data collection tool was calculated as $\alpha=0.77$

3. Results

3.1. The distribution of the prospective teachers' level of innovativeness

In order to evaluate the prospective teachers' level of innovativeness, the ranges of opinions are determined with the formula of $(n-1/n) \times \text{number of items}$ as $n=5$ while analyzing the distribution of 5-item Likert; If the arithmetic mean (\bar{X}) of the total scores obtained from the data collection instrument is between $12 \leq \bar{X} < 21.6$, it is evaluated that the participants “strongly disagree” with the opinion explained in the related statements, if it is between $21.6 \leq \bar{X} < 31.2$, the participants “disagree” with the opinion, if it is between $31.2 \leq \bar{X} < 40.8$, the participants are “neutral” about the opinion, if it is between $40.8 \leq \bar{X} < 50.4$, the participants “agree” with the opinion, lastly if it is between $50.4 \leq \bar{X} < 60.0$, it is accepted that the participants “strongly agree” with the opinion given in the related statement.

In line with the calculated total scores of the data collection instrument, it was obtained that related to 171 students' innovativeness, the general mean score was 45.37 and standard deviation was 5.80. The scores regarding the students' innovativeness vary between 24 and 59. Accordingly, it was seen that the prospective teachers' level of innovativeness was generally good. When each item was examined, it was obtained that the prospective teachers' level of innovativeness was very high, besides, their levels of trying out the innovations, loving the genuine and their preference to look for new ways were also found as high. Moreover, it was seen that the prospective teachers' level of having a voice in a group, having a creative personality, and being an opinion leader and individual who is asked for suggestion or information was high. This result can be interpreted in a way that the prospective teachers' views about changes were positive and they largely found themselves as innovative individuals. On the other hand, it was detected that the prospective teachers' state of being skeptical of innovations till they see them working for other people and having tendency to postpone adopting the innovations until they see their benefits to other people around was at mid level. This can be interpreted in a way that although they find themselves receptive to innovations and changes the prospective teachers have tendency to be cautious about accepting innovations till they are sure about their effects and they see that other individuals in the group use them by being provident to take risks.

Table1. The Relationship between the Scores Related to the Levels of Innovativeness and Use of Technological Innovations

Technological Innovations	r	p
Computer (Laptop, Tablet, PC...)	0.288	.000
Internet	0.317	.000
Web page	0.238	.001
Blog	0.327	.000
Social Network (Forum, News group...)	0.261	.000
Wiki	0.306	.000

In order to determine whether there is a significant relationship between the prospective teachers' level of innovativeness and their use of technology, Pearson Correlation coefficient was calculated and examined. As indicated in Table 1, there is a mid level, positive and significant relationship between the prospective teachers' innovativeness and use of Blog, Wiki and Internet. Besides, it was detected that the relationship between their level

of innovativeness and use of social webs and personal web sites was at low level, but positive and significant. According to this result, it can be stated that as the prospective teachers' level of active technology use, namely using Blog, Wiki, and social webs, increase, the scores related to being innovator are enhanced as well. In other words, the level of using technological innovations such as Blog, Wiki, and web sites can be taken into account as an effective variable to explain the individuals' level of innovativeness.

Moreover, when it was investigated whether there was any significant relationship between the prospective teachers' level of innovativeness and frequency of using technological innovations it was found out that there was a low level, positive and significant relationship between the participants' level of innovativeness and use of Computer [$r=0.202$, $p<.05$], Internet [$r=0.184$, $p<.05$] and Wiki [$r=0.152$, $p<.05$]. In other words, as the frequency of Computer, Internet and Wiki use increases, the participants' scores related to innovativeness are enhanced as well. The related findings are presented in Table 2 below.

Table2. The Relationship between the Scores Related to Innovativeness and Frequency of Using Technological Innovations

Technological Innovations	r	p
Computer (Laptop, Tablet, PC...)	0.202	.005
Internet	0.184	.010
Web page	0.119	.103
Blog	0.102	.168
Social Network (Forum, News group...)	0.115	.115
Wiki	0.152	.042

3.2. The Prospective Teachers' Levels of Using Technological Innovations

When the prospective teachers' levels of using technological innovations were examined, as seen in Table 3, it was obtained that their levels of Internet use were quite adequate, similarly their levels of computer and social web use were sufficient, however, their levels of using personal web sites, Blog and Wiki were partially adequate. Whereas the other point to be emphasized was the fact that although the majority of the participants were female, male participants' rates of having personal web sites and Blogs and subscription to social webs were higher than the females.

Table3. The Level and Frequency of Using Technological Innovations

Technological Innovations	Level of Expertise					Level of Current Use				
	N	\bar{X}	SD	Min	Max	N	\bar{X}	SD	Min	Max
Computer (Laptop, Tablet, PC...)	164	3.35	0.918	1	5	163	4.28	0.681	2	5
Internet	163	3.44	0.943	1	5	162	4.13	0.797	2	5
Web page	157	2.51	1.107	1	5	158	3.00	1.267	1	5
Blog	153	1.93	1.046	1	5	155	2.20	1.101	1	5
Social Network (Forum, News group...)	160	2.88	1.186	1	5	159	3.14	1.200	1	5
Wiki	152	2.18	1.235	1	5	150	2.27	1.251	1	5

In order to examine whether the prospective teachers' level of using technological innovations differ in terms of demographic variables or not, Chi-square test was applied. As a result of the analysis, it was detected that the prospective teachers' level of using technological innovations did not differ in terms of the demographic variables, namely, income, education level of parents, but as seen in Table 4, the participants' level of using Internet [$\chi^2_{(3)}=18.604$, $p<.05$], Blog [$\chi^2_{(3)}=12.100$, $p<.05$], Wiki [$\chi^2_{(3)}=11.835$, $p<.05$] and Computer [$\chi^2_{(3)}=9.516$, $p<.05$] differed significantly in terms of gender. Thus, in comparison with the female participants, the male prospective teachers reported higher level of Blog, Internet and Wiki use. This result supported the finding that although the majority of the participants were female prospective teachers, the male participants were more dominant than the female in terms of using computer, having personal web sites and Blogs and subscription to social webs.

Table4. The Relationship between the Level of Using Technological Innovations and Gender

Technological Innovations	Chi-square	Df	p
Computer (Laptop, Tablet, PC...)	9.516	3	.023
Internet	18.604	3	.000

Web page	4.756	3	.191
Blog	12.100	3	.005
Social Network (Forum, News group...)	8.405	3	.078
Wiki	11.835	3	.008

3.3. The Frequency of Prospective Teachers' Use of Technological Innovations

When the prospective teachers' levels of using technological innovations were examined, as indicated in Table 3, it was observed that they most frequently used computer, then respectively they used Internet, personal web sites, social webs, and Wiki. Lastly, Blogs were used least frequently by the participants in the study.

Table5. The Relationship between the Frequency of Using Technological Innovations and Gender

Technological Innovations	Chi-square	Df	p
Computer (Laptop, Tablet, PC...)	2.800	2	.247
Internet	2.148	3	.542
Web page	1.838	4	.766
Blog	8.349	3	.039
Social Network (Forum, News group...)	1.582	4	.812
Wiki	8.069	3	.045

Chi-square analysis was employed in order to determine whether the frequency of the prospective teachers' use of technological innovations differed in terms of demographic variables or not. As a consequence, it was ascertained that the frequency of the participants' use of technological innovations did not differ in terms of the demographic variables, namely income, the education levels of parents, but as seen in Table 5, the frequency of the participants' use of Blog [$\chi^2_{(3)}=8.349$, $p<.05$] and Wiki [$\chi^2_{(3)}=8.069$, $p<.05$] differed significantly in terms of gender. Accordingly, the male participants used Blog and Wiki more frequently than the female.

4. Conclusion

This study was conducted to evaluate the positions of the prospective teachers, who are about to graduate from higher education institutions, in terms of innovation and technology. On the basis of the findings, it was concluded that the teachers participated in the study largely had the features of innovative individuals; this result was compatible with the findings of Sahin and Thompson's (2006). Moreover, in line with these findings, it can be claimed that these prospective teachers are receptive to innovations and changes and they have the features of originality and inventiveness, which are the expected features of 21st century. However, it should be emphasized that although the prospective teachers found themselves as innovative individuals, they were reluctant about accepting innovations till they ensured about their effects and they saw other people using them. Moreover, it was observed that although the participants reported that they were innovative, they mostly used computer and Internet out of technological innovations, but they did not benefit from the technologies with social participation such as Blog and Wiki. Additionally, it should be pinpointed that a large amount of prospective teachers did not know these technologies. Referring to Odabaşı (2006), this result can be interpreted with the fact that technological innovations should be used intensively in higher education institutions, but in reality it is not realized sufficiently so, the students are not provided with the opportunity to be informed about technological innovations and to perform related applications. Thus, in order to evaluate the picture of prospective teachers in terms of being innovator in detail, related follow-up and qualitative studies should be conducted.

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