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The pre-service teachers' competency perceptions regarding technology planning

Gürkay Birinci[a]*, Kerem Kılıçer[a]

[a]*Anadolu University, Faculty of Education, CEIT, Eskişehir 26300, Turkey*

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Abstract

The aim of this study was to determine the pre-service teachers' competency perceptions regarding technology planning and to evaluate them in terms of gender and grades. In line with this aim, the questionnaire with 29 items was used to collect data from 122 students attending to the Department of Computer Education and Instructional Technologies. According to results, it was found that the students perceived themselves as competent about technology planning process; and there was no significant difference between groups in terms of gender, however the 3rd and 4th grade students perceived themselves competent more significantly than 2nd grade students.
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Keywords: Technology planning; competency perception.

1. Introduction

Ever changing and fast-growing technology restructures the world we live in and changes societies into information societies. Thus, in order that the students will be able to succeed in both academic and social life, the schools should renew themselves using technology so as to train the individuals required by the information era. It is well known that technology can be very beneficial tool as long as it is used at any educational institutions in a planned, effective and efficient way. As an institution, school should integrate technology into every domain of education program, and in this way students' active and meaningful learning should be supported. Appropriate integration of technology at school depends on preparing and applying a well-designed technology plan.

In the developed countries, on the purpose of integrating information and communication technologies into education programs, short term (one and half year) or long term (5 years) plans are developed. These plans are prepared to be applied at all primary schools in a particular region or locally at only one primary school. However, in Turkey it is clearly seen that the technology, which is supplied to school through various projects of Ministry of Education, is both provided and used at school without any plan. Best indicator of this is the fact that the plans for schools regarding determination of technology requirement, purchasing technology and use of technology in teaching are made by Ministry of Education from one headquarters, whereas it is not possible to satisfy the

* Gürkay Birinci Tel.: +90-335-0580 (3519)
E-mail address: gbirinci@anadolu.edu.tr

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requirements of schools in every region in this way. Within this context, the technology plans of the schools should be prepared locally or regionally; as well as the authorities of Ministry of Education, people such school administrators, teachers and students should be included in the planning process.

1.1. Technology Planning and Process

Technology planning can be defined as the dynamic, flexible, and open-ended process revealing the present situation of an institution, giving clues about its future, and intending to determine the mission and vision for the institution to enhance the technology use and cooperation (Gürbüz and Yıldırım, 2001). Technology acts as a bridge between the defined standards and class applications. By organizing education processes and contents, it integrates technologies into a certain discipline (Knuth, Hopey and Rocap, 1996). Technology planning helps education institutions determine the technological priorities also compromise them with institutional, human and material sources.

Application of instructional technologies at schools successfully depends on development of effective technology plans (Bailey, 1997; Cole, 1999; See, 1992). Several models and guides about preparation of a technology plan have been developed by the researchers (McNabb and arkadaşları,1999; Jones, 2005; Knuth, Hopey and Rocap, 1996; Anderson, L.S. 1996). Aforesaid technology plan models and guides emphasize the process related to application of technology plans. This process is explained from different perspectives by different researchers. Accordingly, the steps of technology planning process can be explained as in the following:

1. Forming a technology planning committee
2. Developing a vision statement
3. Conducting a needs analysis
4. Setting goals
5. Developing an action plan
6. Organizing the budget
7. Constructing technological substructure
8. Organizing maintenance and technical support
9. Planning career development
10. Designing extracurricular activities for students
11. Providing the contributions of parents and stakeholders
12. Evaluating the process and results

It attracts attentions that the studies on technology planning have just received attention although the studies of the integration of technology into schools have been continued for a long time. In order to apply technology planning effectively at education institution, it is necessary to equip the individuals involved in this process (school administrator, teachers, technology coordinators etc.) with information and skill necessary for the process. Correspondingly, the pre-service teachers, who are not graduated from the education faculties yet, should graduate with necessary qualities. In this context, in this study, it was investigated to what extent the students attending to Department of Computer Education and Instructional Technology perceive themselves as adequate about technology planning. These students will work as teachers or technology coordinators and they will play important roles in the application of technology planning when they graduate from their department. Thus, the aim of this study is to investigate the technology planning competency perceptions of the pre-service teachers attending to the Department of Computer Education and Instructional Technology. To accomplish this aim, the following research questions were addressed:

1. What are the pre-service teachers' competency perceptions regarding technology planning?
2. Do the pre-service teachers' competency perceptions regarding technology planning in terms of gender?
3. Do the pre-service teachers' competency perceptions regarding technology planning in terms of grades?

2. Method

The survey method was applied in this study to collect the research data. In line with the sub-goals, singular and correlational 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

This study was conducted with 122 students attending to 2nd, 3rd, 4th grades in the Department of Computer Education and Instructional Technology in Education Faculty in Anadolu University in 2008-2009 academic years. 1st year students were excluded from the study since the study was conducted at the beginning of fall terms and these students were still naïve in the field. Demographic information about the participants was presented in Table 1.

Table1. Demographic Information of the Participants

		Frequency	Percentage (%)
Gender	Male	69	56.6
	Female	53	43.4
	Total	122	100.0
Grade	Second grade	41	33.6
	Third grade	50	41.0
	Senior	31	25.4
	Total	122	100.0

2.2. Instrument

To accomplish the purpose of the study, a data collection instrument was developed by the researcher considering the sub-dimensions of technology planning mentioned in the literature. The developed data collection instrument consists of two parts. The first part contains the questions for demographic information and there are statements related to technology planning in the second part. These statements were arranged in 5-item Likert scale as "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree"

While developing the data collection instrument, firstly draft statements were written by the researcher and gathered in an item pool. The 30 items gathered in the pool were examined by totally five experts: one expert in the field of Curriculum Development and Teaching and four experts in the field of Education Technology. Considering the experts' feedback, one item was omitted and other items were rearranged, after that the final instrument with 29 items was prepared. Following its application, the reliability coefficient (Cronbach Alpha) of the data collection instrument was calculated as α=0.93

3. Results

3.1. The Pre-service Teachers's Competency Perceptions regarding Technology Planning

While evaluating the pre-service teachers' competency perceptions regarding technology planning process, the ranges of opinion are determined with the formula of (n-1/n)*number of items as n=5 to analyze the distribution of 5-item Likert. The ranges defined in the evaluation were as follows:

Table2. The Evaluation Ranges for the Questionnaire of Technology Planning Competency Perception

Evaluation Ranges	Over All $\overline{X}$	TP II, IV, V, VI, VIII, IX, X, XI $\overline{X}$	TP I, III, VII $\overline{X}$	TP XII $\overline{X}$
Strongly Disagree	$29.0 \leq \overline{X} < 52.2$	$2.0 \leq \overline{X} < 3.6$	$3.0 \leq \overline{X} < 5.4$	$4.0 \leq \overline{X} < 7.2$
Disagree	$52.2 \leq \overline{X} < 75.4$	$3.6 \leq \overline{X} < 5.2$	$5.4 \leq \overline{X} < 7.8$	$7.2 \leq \overline{X} < 10.4$
Neutral	$75.4 \leq \overline{X} < 98.6$	$5.2 \leq \overline{X} < 6.8$	$7.8 \leq \overline{X} < 10.2$	$10.4 \leq \overline{X} < 13.6$
Agree	$98.6 \leq \overline{X} < 121.8$	$6.8 \leq \overline{X} < 8.4$	$10.2 \leq \overline{X} < 12.6$	$13.6 \leq \overline{X} < 16.8$
Strongly Agree	$121.8 \leq \overline{X} < 145.0$	$8.4 \leq \overline{X} < 10.0$	$12.6 \leq \overline{X} < 15.0$	$16.8 \leq \overline{X} < 20.0$

In line with the total score obtained from the data collection instrument, 122 students' mean score was calculated as 103.85 and SD was 14.52. On the basis of the scores to be obtained from the instrument, minimum score was 29 while the maximum was 145. Accordingly, it was observed that the participants generally agreed with the statements

related to technology planning process and their technology planning competency perceptions were above the average. Furthermore, when examined in terms of sub-dimensions of technology planning process, it was ascertained that the participants were generally irresolute on the statements about "forming technology planning committee" and "developing vision statement "and their competency perceptions were detected as average. However, it was seen that they generally agreed with the statements about other sub-questions and their competency perceptions regarding these dimensions were observed as above average.

Table3. The General Distribution of the Participants' Competency Perceptions regarding Technology Planning

	$\overline{X}$	Sd	Min	Max
General Distribution	103.85	14.52	53.00	130.00
TP–I	9.98	2.50	3.00	15.00
TP–II	6.16	1.90	2.00	10.00
TP–III	11.37	2.15	4.00	15.00
TP–IV	9.98	1.27	3.00	10.00
TP–V	7.25	1.42	3.00	10.00
TP–VI	6.86	1.59	3.00	10.00
TP–VII	11.16	2.08	4.00	15.00
TP–VIII	7.43	1.43	4.00	10.00
TP–IX	6.98	1.34	3.00	10.00
TP–X	7.14	1.34	2.00	10.00
TP–XI	7.14	1.63	3.00	10.00
TP–XII	14.66	2.55	6.00	20.00

Finally, it was determined that the sub-dimension that the participants perceived themselves as most incompetent during technology planning process was "developing a vision statement", on the other hand "setting goals" was the sub-dimension they perceived themselves as most competent.

3.2. Do the pre-service teachers' competency perceptions regarding technology planning in terms of gender?

It was investigated whether the technology planning competency perceptions of the pre-service teachers attending to the Department of Computer Education and Instructional Technology differed in terms of gender or not and the obtained findings were presented in the following:

Table 4. The Results of t-test related to the Relationship between the Participants' Technology Planning Competency Perceptions and Gender

Gender	N	$\overline{X}$	SD	df	t	p
Female	53	105.81	14.12	120	1.310	.193
Male	69	102.35	14.74			

As seen Table 4, the participants' technology planning competency perceptions did not differ significantly in terms of gender [$t(120)=1.310, p<.05$]. Thus, it was seen that female students' technology competency perceptions ($\overline{X}=105.81$) were statistically higher than the male students' ($\overline{X}=102.35$) but the difference between them was not significant. This finding can be interpreted in a way that both female and male students similarly perceived themselves competent.

3.3. Do the pre-service teachers' competency perceptions regarding technology planning in terms of grades?

In both Table 5 and 6, the relationship between the participants' technology planning competency perceptions and their grades was indicated.

Table5. The Descriptive Statistics on the Participants' Technology Planning Competency Perceptions and Grades

The Students' Grades	N	$\overline{X}$	SD	Standa l Error
II. Grade	41	98.24	16.57	2. 9
III. Grade	50	106.60	13.48	1. 1
IV. Grade	31	106.84	11.07	1. 9
Total	122	103.85	14.52	1. 1

Table 6. Analysis of Variance Results on the Participants' Technology Planning Competency Perceptions and Grades

The Source of the Varianc	Sum of Squ ıres	df	Mean Sc ıare	F	p	Significant Dif erence
Between Groups	1943.59	2	971.795	4.908	.009	II-III, II-IV
Within Groups	23561.755	119	197.998			
Total	25505.344	121				

When Table 5 and 6 were examined, it can be seen that there is a significant difference between the participants' technology planning competency perceptions and their grades [F(2-119)=4.908, p<.05]. Scheffe post-hoc multiple comparison test was applied to find out which group caused this difference. According to the results of this test, it was obtained that 4th grade students' ($\overline{X}$=106.84) and 3rd grade students' ($\overline{X}$=106.60) technology planning competency perceptions were significantly higher than the 2nd grade students' ($\overline{X}$=98.24). Thus, it can be claimed that as the students' grades increase, their technology planning competency perceptions also enhance.

4. Conclusion

In this study, which was conducted to determine the pre-service teachers' competency perceptions regarding technology planning process, it was obtained that the students attending to 2nd grade did not perceive themselves as competent about technology planning; on the other hand, the 3rd and 4th grade students perceived themselves competent about this issue. Although in education-teaching process, the students did not have any courses related to technology planning, the reason why they perceived themselves as competent in this issue is the fact that the contents of some pedagogy courses they took and some aspects of technology planning process may accommodate with each other. Although the students perceived themselves competent in technology planning process, their competency perceptions were not at the expected level but a little high over the general average. Furthermore, as explained in the results, it was determined that the students did not perceive themselves competent in some sub-dimensions of technology planning. This result may be caused due to that the students did not perform any application activities related to technology planning. In this context, the students, who will work as expert in technology planning, should graduate from the Department of Computer Education and Instructional Technologies by performing applications related to technology planning process.

There are some basic mistakes and problems encountered in the preparation and application of technology planning process (Sibley and Kimball, 2004). Some of them can be counted as preparation of the plans like a shopping list, making plans with one or two people, restricting the technology support system with maintenance and repair, not developing a strong teaching vision, not explaining how to use technology in teaching and learning process etc. In order to encounter such mistakes and difficulties less and to take necessary measures, it is significant to train students with necessary qualities of technology planning and then graduate from the department, by working in cooperation with universities and Ministry of Education. Thus, the problems possible to encounter during the process of technology planning application prepared at schools, will be minimized.

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