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Evaluation of the basic technology competency of the teachers candidate according to the various variables

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Abstract

The working group of this research that aims to determine the level of the basic technology competency of teachers candidate who are the students of education faculty of today and the teachers of future consists of 120 Biology, Physic, Chemistry and Mathematic teachers candidate from Education Faculty in Hacettepe University. As a data collecting tool The Basic Technology Competency Scale for Educators is used which is developed by Flowers and Algozzine (2000) and validity and reliability tests are done by Erkan Tekinarslan (2008) ($\alpha = .95$). At the end of the research process it's found that most of the teachers candidate have basic technology competency at least mediate level and male teachers have higher competency than female teachers and when analyzed according to the branches it's seen that there are statistically meaningful differences among teachers.
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Keywords: Basic technology competency; teachers candidate; technology; computer technologies; education.

1. Introduction

Education and technology are two important basic elements in making ones life more efficient. Technology is a tool which provides an individual benefit from the knowledge and skills he gain through education more efficiently. The rapid access of technology to our daily life and gradually become widespread force us to associate education with technology. Using technology in education is one of the important parts of education and the relation of technology of today. Technology in education mostly used for supporting teaching, having rich experiences and making education a bit individual. Determining active teaching strategies for productive teaching is closely related with teachers using technology. So many researches have done in order to measure the competence of teachers in using technology (Yavuz, 2005; Fisher, 1997 & Sheffield, 1998). The important finding found in this research is that negative approaches of their faculties negatively affect the attitude of the teachers about the subject (Akpınar, 2003). The central theme of the researches is that education in the faculties very closely related with teachers' using technology in an effective and useful way. An effective teacher should be a good technology-literate and shouldn't neglect the fact that the students also should be educated in the same direction with the purpose. The reason is that technology-literate individuals much more effectively work to receive and use the information, solve the problems,

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and make decisions by taking attention the probable risks, profits and the opportunities about their professional and technology and create new ideas. The competence of the teachers candidate should be developed related to using technology in a good planned and coordinated way because both acknowledging the conceptual side of technology and educating teachers who have the most effective part in absorbing new technologies is equally important as equipping the educational institutions. From this point of view, the research is a due diligence aims to determine the competence of the teachers candidate in terms of using technology.

2. Method

The aim of this work is to determine the basic technologic competence of the teachers candidate largely about computer technologies and software. The study group of the research consists of 120 teachers candidate in Biology, Physic, Chemical and Mathematic branches in the department of OFMA from Hacettepe University Education Faculty. The data of the research are collected by "The Basic Technology Competency Scale for Educators" (α = .95) developed by Flowers and Algozzine (2000) and credibility and reliability of the study is done by Erkan Tekinarslan (2008) according to the conditions of Turkey. The Basic Technology Competency Scale for Educators" using as a reliable test for determining the competence of an individual in terms of computer technology consists of 46 questions and 9 subsections. The measure is in the form of likert design as "Very Qualified", "Qualified" and "Unqualified" and beginning with the "Very Qualified" option grading as 4,3,2,1.The grades taken from the subsections of the measure show high competency and low grades show low competency. The general conditions of the teachers candidate about the knowledge of basic computer and information technology and whether they use them in an effective way, word processor, using internet and communication skills by using media are determined in the research. In the light of the findings, it's examined in each subsection whether there are meaningful differences in terms of sex and the type of the program they study.

3. Results

In this research the competence of the teachers candidate are examined such as knowledge about basic computer and information technologies and use them effectively, defining small problems encountered when using technology, word processor, internet and communication skills through media and find solutions to these problems; having enough knowledge about installation, maintenance, problem solving, data base and data communication and moreover the competence in designing the systems contribute to the education is examined in this research. 120 candidate teachers' technology competency are tried to be found in the concept of whether they think themselves adequate for this concept or not by selecting one of the items in the measure as "Well qualified", "Qualified", "Lowly Qualified" or "Unqualified". When findings are examined before doing statistical analyses, non-parametric hypothesis are applied as it's found that numerical data is not in normal distribution. In the first section of the research in order to evaluate the candidate teachers' technology adequacy in the concept of sex variation, the grades they get from technology adequacy test analyzed by Mann Whitney U-Test .

Table 1. The results of the candidate teachers' technology aqequacy according to the sex in the U-Test

Group	n	Mean Rank	Rank Total	U	p
Female	83	57.34	4759.00	1273.000	.136
Male	37	67.59	2501.00		

As a result of the analyze, as its seen in Table 1, there is no meaningful difference between male and female candidate teachers' technology adequacy (U= 1273.000, P>.05). The result of Kruskall Wallis Test of the grades is shown in Table 2 which the teachers candidate who study in the branches of Physic, Chemical, Biology and Mathematic get from the measure of technology competency.

Table 2. The comparison of candidate teachers' technology competency according to the branches, the result of Kruskal Wallis Test

Group	n	Mean Rank	sd	χ^2	p	Meaningful Difference
Chemical	30	47.77	3	8.281	.041	
Physic	30	68.75				Chemical - Physic, Chemical - Biology
Mathematic	30	55.90				
Biology	30	69.58				

When Table 2 is examined It's seen that the results of the analyze and the grades that teachers candidate get from the measure of technology competency meaningfully differentiate according to the branches they study [χ^2 (3) = 8,28, p<.05]. Mann-Whitney U test is applied in order to find how these differences occurred among these branches and it's found that chemical teachers have lower technology adequacy when compared with physic and biology teachers and also seen that the difference is meaningful. In the same way, when mean rank of the teachers is taken into consideration, chemical teachers get the lowest mediate with (47.77), biology teachers get the highest mediate with (69.58) and apart form these results it's seen that physic teachers get (68.75) and Mathematic teachers get (55.90) in the measure.

Table 3. The comparison of the grades of the candidate teachers in the subsections of the measure according to the branches, the results of the Kruskal Wallis Test

Category	Group	Mean Rank	sd	χ^2	p
Basic Competency in Using Computer	Chemical	44.97	3	10.476	.015
	Physic	65.48			
	Mathematic	62.63			
	Biology	68.92			
Word Processor	Chemical	50.83	3	8.084	.044
	Physic	72.07			
	Mathematic	53.08			
	Biology	66.02			
Spreadsheet	Chemical	39.75	3	31.333	.000
	Physic	85.48			
	Mathematic	48.87			
	Biology	67.90			
Communication With Media	Chemical	49.77	3	9.207	.027
	Physic	61.93			
	Mathematic	55.08			
	Biology	75.22			

In Table 3 the result of Kruskall Wallis Test of the grades are shown that Chemical, Physic, Mathematic and Biology teachers candidate get from 4 subsections of the measure of technology competency. According to these results, biology teachers get the highest grade in the sections of "Basic Competency in Using Computer" and "Communication with Media" and physic teachers get the highest grade in the sections of "Word Processor" and "Spreadsheet".

At the end of the research, the competence of the teachers is arranged by considering the mediate grades of the teachers candidate get from the 9 subsections of The Measure of Technology Competency. As it's seen in Table 4, teachers get the highest mediate in the subsection of the "Word Processor" and get the lowest mediate in the subsection of the "Database".

Subsection	$\overline{X}$	ss
Word Processor	3.7827	1.4823
Basic Competency in Using Computer	3.7606	.4467
Using Internet	3.4783	.5796
Communication with Media	3.4198	.5715
Telecommunication	3.2938	.5828
Installation, Maintenance ve Problem Solving	3.0626	.7012
Spreadsheet	2.9084	.8560
Social, Legitimate and Moral Issues	2.7080	.8997
Database	2.3013	.9459

Table 4. average standard

The and

diversion values of the grades teachers get from the measure .

4. Discussion

During the analyzing period of the research, it's found that most of the teachers candidate are competent in using basic technology at least mediate level. In more special analyses it's found that generally male teachers have more adequacy in using technology than female teachers, however statistically this difference isn't found meaningful. Moreover, when their competence is evaluated according to the branches it's found that there are statistically meaningful differences. It's seen that there is a meaningful difference in the analyses of the grades of the Chemical, Physic, Mathematic and Biology teachers' competence in using technology that they get from the subsections of the measure such as "Basic Adequacy in Using Computer", "Communication With Media", "Word Processor" and "Spreadsheet". Biology teachers get the highest grades in the fields of "Basic Adequacy for Using Technology" and "Communication with Media"; Physic teachers get in the sections of "Word processor" and "Spreadsheet"; and Chemical teachers are at the bottom of the list with the lowest grade they get in each subsection of the measure. One of the reasons of this result may be their mentality about the subjects and lesson content of their branches as they think that they don't need technology. However it's necessary for them to accept that there are other technologic materials apart from chalk and blackboard. Moreover, the attitude of the chemical teachers towards technology may be negative or they may be reluctant to use technologic materials. All of these situations may be examined in different works.

According to the results, we can say that the adequacy of the teachers is enough in setting the margin, changing the size and type of the writing, cutting, copying and passing a line in one or another text, add a file, graphic or table to a document, adequacy in using word processor (e.g.:MS Word), (O=3.7827). Moreover another striking finding is that when asking the general situation of the teachers' competence in adding new data to the cell, carrying data in the spreadsheet, using formulas, drawing a graphic and using spreadsheet, they choose the option of "Lowly Qualified" (O=2.9084). Besides, it's found that considering the competence in adding a data to the data base (e.g.: Access), separating and searching a data in the database, writing a report and searching by using AND and OR that they mostly choose the "unqualified" option (O=2.3013) in the measure.

According to the findings, what is striking is that most of the candidate teachers' basic competency in using computer is enough for inserting and pulling out a flash disc, collecting files in a sub-folder or subdirectory, accessing a data to a CD-ROM, diskette, flash disc and hard disc, forming and deleting a folder or subdirectory, forming, arranging and printing different documents. (O=3.7606). Besides, it's seen in the measure that male teachers are much more adequate than female teachers in protecting flash disc, virus protection, connecting assistant

hardware equipments (e.g. printer, scanner) to the computer, memory direction that examined under the item of "Installation, Maintenance and Problem Solving". The reason of this result may be the belief common in female teachers that such issues like installation, maintenance and problem solving are more technical and required to have technique and they think themselves inadequate about these matters. When the data acquired in the research is examined it can be said that generally the adequacy of the teachers' skills is enough in using internet such as connecting to the internet, online work, sharing electronic files and having knowledge about the advantages of the server (O=3.4783). The teachers candidate think themselves generally adequate for using telecommunication such as sending and receiving e-mail, using World Wide Web, becoming member of List-serv, on the other hand they don't think themselves equally adequate for developing a program by using a software system or language. However, most of the schools even students have their own web site. There are fields for teachers working in schools where they can put the materials they own prepared. Teachers have to be active in these sites of their schools by these way candidate teachers' telecommunication skills and knowledge should be necessarily adequate.

According to the data getting from the research, most of the teachers candidate conveys that their skills are adequate for using overhead projector, preparing electronic slide (Powerpoint), interactive slide, presentation consisting visual materials and voice, communication with media (Electronic slide, overhead projector etc.) (O=3.4198). As a result of the data analyzing getting from the research, the low grades of the teachers candidate which they get from the questions about "Social, Legitimate and Moral Issues" (O=2.7080) show that they are inadequate in this field. The most common problems in moral issues are that when preparing notes for the lesson, teachers quote without showing a reference and they use unlicensed programs and software that exist in virtual field. According to the researches about this issue, especially internet triggers, supports and even generalizes the infraction of academic rules (Odabaşı & Kabakçı, 2007).

5. Conclusion and Recommendation

It's not enough for teachers only to know technology. Besides, they should be competent in using technology. For this reason, existing competence should be revealed and deficiencies should be completed, also infrastructure should be prepared for developing existing adequacy. Teachers should be capable of preparing proper materials for education technologies (slide, test etc.) they use in the class before the lesson and they should present colorful animations and slides for the students that help them to understand lessons more easily and lastingly. Moreover, teachers should be competent in using computer in preparing lesson notes and exam questions or able to scan and load a document necessary for the lesson. In short, every teacher should easily and necessarily use office programs. The most attracting result in the research is the fact that teachers have not enough knowledge about copyrights, sharewares, software piracy and intellectual property rights, social, legitimate and moral issues. The reason of this finding may be the lack of information they get during their education period about social, legitimate and moral issues. So, it's thought to be beneficial that experts at social, legitimate and moral issues may be called and provide them give conferences and seminars to the candidate teachers in universities. Teachers should know the techniques of the tools they use and should use them effectively on their own. For this reason, they should not only take lessons aim to introduce and give ability to use computer, but also aim to develop technique skills of the teachers. Theoretical, ethical and practical lessons should be focused on which develop the technological competence of teachers candidate. Female teachers' lack of knowledge about technical matters attracts attention. There should be education programs that not only for using technology in education but also help them to gain skills and knowledge about technical structures and features of the technologic materials. Some kinds of efficiencies in skills and knowledge of the teachers candidate about software and hardware are determined. For this reason, necessary collective works should be done with people and constitutions in order to gain efficient skills for maintenance and repair of technological hardware and peripheral.

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