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## Computer literacy levels of teachers

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### Abstract

The purpose of this study is to determine the levels of teachers' computer literacy, which is a need for teachers especially in both reaching information and making the process of learning and teaching more effective. With this aim in mind, an inventory developed by the researcher was administered to 506 teachers in Malatya, Turkey, in the 2008-2009 academic years. The obtained results were analyzed using t test and one-way analysis of variance. At the end of the research, in terms of computer literacy levels, significant difference was found between the levels of male teachers and female ones, and teachers with high teaching experience and those with low teaching experience, and also teachers with high education level and those with low education level. In order to increase the computer literacy levels of teachers; a standard such as European Computer Driving License (ECDL) and the like must be determined, and teachers must be encouraged and supported to get this certificate.

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*Keywords:* Teachers' computer literacy; computer literacy; electracry; teacher; computer skills.

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### 1. Introduction

One of the most important determining characteristics of our century is that information is increasing at a level too fast to catch up. In such an atmosphere, it is unavoidable to create, develop and update the skills of people in information-based professions. Otherwise, their professional skills and status may be questionable.

Basic skills of teachership, as one of these professions, are supposed to be “teachers' teaching ability”, “world knowledge” and “subject knowledge”. Skills in each of these areas are constantly changing and can no longer be continued with only pre-service education.

It is the computer that is of great help with adaptation to this change since computer provides an environment to create, transfer and share any kind of information. In this virtual environment, getting the necessary information fully and on time; making use of the obtained information in personal and professional development and thereby becoming and effective teacher are all directly related to the competency to use the computer effectively for these aims.

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Though no fault of their own, most teachers are not prepared to teach about computing or use a computer in teaching because they received their education "BC" before computers. Now they're finding they need computer literacy as part of their jobs (Martin & Heller 1982).

Teacher attitudes toward computer technology may be a significant factor in the use of computers in education. Computer literate individuals will reap greater benefits than their counterparts who lack that knowledge (Satharasinghe, 2006). Not only in getting the information but also making the learning and teaching process more effective, the supposed skills of teachers, related to computers, are described as "computer literacy" the idea that there is some basic familiarity with computers (Brain, 1983). This term means more than "reader" and "writer" in world of computers. Nowadays, the term "electracy" is preferred to use instead of "computer literacy" (Ulmer, 2003). According to theorist Gregory Ulmer (2003), electracy is to digital media what literacy is to print, and is totally different from the term "computer literacy". Electracy describes the kind of "literacy" or skill and facility necessary to exploit the full communicative potential of new electronic media such as multimedia, hypermedia, social software, and virtual worlds.

### *1.1. Purpose*

The purpose of this study is to determine the levels of teachers' computer literacy, which is important in both getting information and making the learning and teaching process more effective.

With the findings of the research, the answers will be given to the questions of "is there a significant difference between the levels of teachers' computer literacy" in terms of gender, teaching experience, the latest educational institution, the latest education level and fields.

Determining the level of teacher's computer skills makes it possible to put forward the daily problems and to propose suggestions towards the solution to these problems.

## **2. Method**

This paper is a descriptive research aiming to determine the levels of teachers' computer literacy.

The population of the study is the teachers in Malatya, Turkey. The sample is 506 teachers who voluntarily take part in the research and fill in the inventory fully and correctly according to the instructions.

### *2.1. Data Collection Tool*

In the research, a data collection tool, which has two parts, was developed by the researcher in order to "determine the levels of teachers' computer literacy".

In the first part, there are five questions aiming to determine teachers' gender, field, latest graduation institution, latest education level and total teaching experience.

In the second part, there are 13 questions using 5-point Likert scale in order to determine "at what level the teachers have the skills in computers". Teachers were asked to mark their skill levels for each question as "a great deal", "much", "somewhat", "little", "never".

### *2.2. Developing a Data Collection Tool*

While developing an inventory for the research, at first, a literature research concerning the competency in computer literacy was done, then an interview was conducted with three teaching staff having a course on "Basic Information Technology", which is a course of Educational Faculty for future teachers; another interview was conducted with nine master students from the Department of Educational Administration and Supervision, who are primary school inspectors and principals, on the competencies regarding computer literacy, and later a 31-item initial form of inventory was developed.

This initial form was distributed to six teaching staff from Education Faculty of Inonu University and five teachers to be administered to get the evaluations in terms of content and clarity. With the help of experts and teacher candidates, some changes (i.e. correcting spelling and grammar mistakes) and were done in the inventory; repeated and not measuring questions were discarded, and the final form of the initial inventory was developed. In

the final draft of the initial form of inventory were included 15 items. For reliability and validity, this final form of inventory was administered to 506 primary school teachers in the city centre of the province of Malatya. Having been found valid for explanatory factor analysis (Kaiser Meyer Olkin = .95, Bartlett's Test of Sphericity= 5179.843,  $p = .000$ ), the data were analyzed using factor analysis through method of principal component analysis. 8th and 15th items were discarded due to a high factor loading, then at the end of repeated analysis, it was determined that the inventory has a structure with one factor and 13 questions. As a result of analysis, variance ratio was % 62.135. Kline (1994) argues that having a variance over % 30 is a one of the significant indicators for structure validity. According to analysis results, factor loads of the items on the inventory varied from “.66” to “.85”, item-total correlation coefficient varied from “.67”, to “.85”. With the analysis within the reliability studies, internal consistency coefficient was found “.95”. Based on the findings obtained from above mentioned analysis, the inventory was found to be valid and reliable to determine the levels of teachers' computer literacy.

The developed data collection tool was administered to 506 teachers in Malatya, Turkey, in 2008-2009 academic years.

Obtained from the application of the developed inventory, the data was recorded on computer and were analyzed through SPSS 17.0 statistical package program.

### 3. Findings

The data gathered were analyzed using SPSS 17.0, the findings are as follows:

Table 1 shows t test results, which were conducted to determine if there is significant difference in gender regarding the computer skills of teachers.

Table 1. T Test correlation results of computer literacy levels of teacher and gender

Gender	N	Mean	Std. Deviation	t	p
Female	229	37,25	11,35	3,457	.00*
Male	277	41,24	13,86		

At the end of gender variance analysis, there was significant difference between the opinions of female and male participants, in favor of males. A similar research on usage of computer applications by science teachers validates this finding (Ocak, 2008). In this study, the finding that male teachers have a higher significant difference than the female ones is paralleled with the findings of the research done by Özçelik and Kurt (2007), Keskinçelik and Alabay (2006), Morgil, Seçken and Yücel (2004), Galpin et al. (2003).

2. Table 2 shows one way variance analysis results, which was conducted to determine if there is significant difference in total teaching experience regarding the computer literacy.

Table 2. ANOVA Results of computer literacy levels of teachers and teaching experience

Teaching Experience	N	Mean	Std. Deviation	F	p	Difference (Scheffe)
1. 7 years and less	135	43,31	12,77	13,299	.00*	1>3
2. 8-14 years	131	42,00	12,27			1>4
3. 15-21 years	97	37,12	12,31			2>3
4. 22 years and more	143	35,00	12,51			2>4
Total	506	39,44	12,93			

As can be seen in Table 2, perceptions of participants regarding computer skills vary significantly in terms of total teaching experience. At the end of Scheffe test, which was done in order to determine which group causes the difference, significant difference was found between those with 7 years and less teaching experience and those with

15-21 years and 22 years and more; those with 8-14 years and those with 15-21 years and 22 years and more. The more teachers have teaching experience, the less they have computer literacy. This finding is paralleled with the findings of the literature (Jones, 2001; Özçelik & Kurt, 2007).

3. Table 3 shows one way variance analysis results, which was conducted to determine if there is significant difference in latest educational institution regarding the computer literacy.

Table 3. ANOVA Results of computer literacy levels of teachers and educational institution

Educational Institution	N	Mean	Std. Deviation	F	p	Difference (Scheffe)
1. 2-year Institute	163	34,98	12,54	11,692	,00*	1<2
2. 3-year Institute	198	42,76	12,29			1<4
3. Education Faculty	50	39,00	11,56			
4. Technical Education Faculty	95	40,37	13,32			
Total	506	39,44	12,53			

As can be seen in Table 3, significant differences were observed between the opinions of participants. When mean scores were examined, we can say that graduates of 3-year institute and technical education faculty perceive themselves to be more skillful when compared with those from 2-year institute.

4. Table 4 shows one way variance analysis results, which was conducted to determine if there is significant difference in latest educational level regarding the computer literacy.

Table 4. ANOVA Results of computer literacy levels of teachers by educational level

Educational level	N	Mean	Std. Deviation	F	p	Difference (Scheffe)
1. two-year associate degree	134	33,80	11,74	17,053	,00*	1<3
2. complementary undergraduate	70	37,90	13,54			1<4
3. undergraduate	285	41,87	12,29			2<4
4. graduate	17	49,47	11,11			
Total	506	39,44	12,53			

\*p<,05

When examined the findings in table 4, significant difference can be seen between the opinions of participants. According to mean scores of the groups, teachers with two-year degree (two-year associate degree) feel that they are less skillful than teachers with undergraduate and graduate degrees, whereas teachers complementary undergraduate see themselves less skillful than teachers with graduate degree.

5. Table 5 shows t test results, which was conducted to determine if there is significant difference in subject regarding the computer literacy.

Table 5. T Test results of computer literacy levels of teacher and subject

Subject	N	Mean	Std. Deviation	t	p
1. Class Teacher	274	37,28	12,67	4,147	,00*
2. Subject Teacher	232	41,99	12,80		

To the analysis in terms of subject variance, there is significant difference between the opinions of participants in favor of subject teachers.

When all findings were evaluated, it can be seen that computer literacy level of teachers is medium (descriptive average:  $39,44/13=3,03$ ). This finding is paralleled with that of the research by Ozçelik and Kurt (2007).

#### 4. Conclusions and Discussions

It is the teachers who are responsible for educating the future generations. In order to discharge the responsibility at desired level, teachers must prepare themselves for the future. For this purpose, they need to develop and update themselves constantly. Thus, they will be able to both get personal development and also be useful to the students by creating an effective learning and teaching process. It is possible to realize this task by being aware of ways to access to information and actively making use of it. For this, the most effective means is the computer. A teacher has an opportunity to reach this goal in parallel with his being computer literate.

In this study, teachers' computer literacy levels were discussed. A general evaluation of the data gathered indicates that the computer literacy level of teachers' is medium (descriptive mean:  $39,44 / 13 = 3,03$ ). In addition, it was found that the computer literacy level of male teachers, novice teachers with less teaching experience, teachers with high education level, and subject teachers was higher than that of female teachers, senior teachers, ones with low education level and class teachers.

Based on these basic findings, the suggestions are as follows: In order to increase the computer literacy levels of teachers; a standard such as European Computer Driving License (ECDL) and the like must be determined, and teachers must be encouraged and supported to get this certificate. For this purpose, an in-service training can be organized for volunteer teachers. At the end of this in-service training course, the certificate that will be given to accomplishing teachers can be used as a criterion for teacher career system i.e. promoting to “expert teacher”, “head teacher”, or to administrator or supervisor position. During supervision period, competencies in such areas can be used as a valid evaluation criterion and teachers' positive evaluation results can be turned into additional payments. Teachers can be supported to buy low-cost or costless computers.

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