Obstacles at Integration of Schools into Information and Communication Technologies by taking into consideration the Opinions of the Teachers and Principles of Primary and Secondary Schools in Turkey

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Abstract

Advances in information and communication technologies (ICT) have also affected educational institutions. Due to its importance in society, education should be adapted promptly to ICTs .As such; this would be an important step to implicate the possible obstacles in the integration of schools to ICT and to take the required preventive measures. The rationale underlying this study will hopefully help in gaining better perspective to overcome the obstacles for the integration of the schools in Turkey into ICTs. For this purpose, we consulted teachers and principles in primary education. The "School Survey of Obstacles in Integration of the Schools and ICT", was designed by the researcher and used in the present study. The survey was administered to 1564 persons in 214 schools. Mean was 2.242 and standard deviation was .524 for the entire group of participants of the study. These figures correspond to "Serious obstacle" as the point intervals coded according to the alternatives. Accordingly, the teachers and principles discussed the current obstacles that might be considered "serious" in the integration of Turkish schools into ICT. On the other hand, whereas some of these obstacles have a more serious nature, others exhibit different characteristics due to the various variables.

Introduction

Essentially, one of the principal objectives of education is to train individuals corresponding with the requirements of society. Indeed, the requirements of any society are highly influenced by the demands of other societies throughout the world. As a result, the current decade stipulates the obligation of training students on the basis of vital characteristics of an information society found in the Turkish educational system which ideally should run parallel with those recognized by overseas educational systems. Nowadays, to be equipped with the ability to assess information, to compose, to evaluate, to use the information and to communicate with others have become absolute requirements for trained people. One way to make this necessity easier and more efficient can be located in the integration of the Turkish educational system into ICT (Smeets et.al. 1999; Blumenfeld et.al. 2000; Lally 2000). This integration has two basic elements complementing each other which reflect on the students' needs. That is to say that, this process necessitates both teachers and school principals.

In schools, the teacher is required to provide behavioral changes in the student. The teachers are expected to integrate their lessons with ICT in order to train the individuals of an information society. A number of studies were conducted to explore the relationship between ICT and the teacher (Moseley et al. 1999; Salamon 2000; McCannon & Crews 2000; Morales et.al. 2000; Gamble & Easingwood.2000; Selwyn et.al. 2001; OECD 2001; Fluck 2001; Zhao & Cziko, 2001; Hardin 2001; Asan 2001; Doornekamp 2002;Isman 2002; Granger et.al. 2002; Ainley et. al. 2002;Demetriadis et.al. 2003;Kocasaraç 2003;Akpinar 2003; Lin et.al. 2004; Ruthven et.al. 2004; Mooij 2004). These researchers' position underlines a predominant feature. Indeed, their recognized opinions echo the same sentiments of O'Donnell (1996): "ICT entered the school but couldn't enter the classrooms and more computers are still being used for the purposes of computer literacy. They are not being used in the classroom as a supporting material of training". On the other hand, the above mentioned researchers noted that this might be the result of various factors.

To hold any currency, the performance of the ICT teacher depends on several factors ranging from his training ability to his motivation. In fact, these are closely linked to establish a positive ICT environment by the school administration (Nisan 2002; Otto and Albion 2002; Atkins & Vasu 2000).A number of studies embracing the opinions, attributes, and the adequacies of school administrators on ICT can be found in the literature. (Leithwood & Montgomery 1982; White 1985; Foriska 1991; Visscher 1992; Riehl et.al. 1992; Kearsley and Lynch 1994;Visscher et.al. 1999; Gibson 2001; Smerdon et al. 2000, Hope, Kelley and Guydern 2000; Wells 2000; Pelgrum 2001; Mioduser et.al 2002; Bryderup & Kowalski 2002; Can 2003). These studies demonstrate that in the light of this approach, the positive changes will facilitate further engagement on ICT by the administrators.

Similarly to other countries, projects are being conducted in Turkey for promoting the basic steps to apprehend firstly, the requirements of an information society and secondly, for the use of computers in schools. Among these projects, the "Catching the Epoch 2000 Project" and "The Project of Improving the National Education" (PINE) (1992-1997), with the contributions of the World Bank are the core foundation of this desired evolution. Furthermore, Integrated Administrative Information System of the Ministry of Education is currently under the extent of the project PINE (Ministry of Education, 2004-a). Another project, "Basic Education Program, Phase-I" has became effective as from 01.08.1998 with the support of a loan agreement between the Ministry of Education and the World Bank. Within this framework, 2837 Classrooms of Information Technology were founded in 2451 schools. In this context, 2837 server computers, 42.205 student computers, 2460 computers for teachers, 2370 administrative computers, 4373 printers and 2377 scanners were purchased, including office software, peripheral hardware and network equipments. Network transactions and installation of the schools in question were carried out by the coordination of the Head Office of Educational Technologies (Ministry of Education, 2004-a). The main purposes of these studies were to incorporate the availability of computers and internet access to public schools (Ministry of Education, 2004-b), training teachers on using computers and integrating the information technologies within the educational system.

A central issue of a number studies, some of which have been mentioned earlier, signify the crucial role of both teachers and school directors/principals in the ICT application. That is to say that, the facilitator in the classroom is the sole responsibility of the teacher when it comes to training the students. Indeed, for ICT implementation, the school administrators should oversee the performance of the teachers in applying this method accurately. Taking into consideration the attempts and efforts of the Ministry of Education we can argue that, the Ministry is particularly emphasizing the necessity of providing more computers at the expense of the integration of ICT into the schools. Henceforth, it appears that the Ministry is ignoring the effective use of computers in education- training. Accordingly, ICT

implementation addressed to teachers and administrators, which are two important dimensions of the school, seem to go unnoticed. We can easily say that, the computers in school are underused accessories which adorn the principal office, whereas the teachers keep them as non-used equipment.

The aim of this study was to provide information to those responsible for the initiation process in encouraging the desired improvement on the present learning situation. Indeed, by determining the obstacles we would be making the first attempt to integrate the schools with ICTs.

This study focuses on two main issues. To start with, the issue related to the question, "what are the main obstacles in integration of ICT in the primary and secondary schools?" needs to provide unambiguous answers. Related to this question, other variables, namely, the type of school teachers /principals are employed, the location of the school (rural/urban), the responsibilities of the teachers, gender of the teaching personnel plus the required knowledge on ICT based on any specialized courses require the views of those concerned in the process, both teachers/principals. The second issue involves enquiring on how the obstacles transpired and how they affected the schools' performance in this domain. Hence, after the analysis of the collected data, a list derived from the findings, which underlined the concerns of the obstacles involved in the process, was presented to those educators which bore the same characteristics.

Method

First of all, a study context was determined. This consists of the teachers and principals employed in 152 primary schools and 62 secondary schools; 116 schools located in rural area and 98 schools in urban areas, in the 2003-2004 educational seasons. The total number of teachers and principals in the urban areas consists of 1737 in the primary school sector and 812 for the secondary schools. The number of teachers and administrators in the rural areas is 1013 for the primary schools, and 522 for the secondary schools. The sample of the study consists of 1564 teachers and administrators selected from this specimen.

In the present study, "Obstacle Survey for the Integration of the Schools and ICT (OSIS-ICT)" was developed by the researcher in 2003 and its validation was confirmed by expert views. Item analysis was used as a data collection tool. For the reliability of the test, testing-retesting method was employed and the Pearson's momentums Multiplication correlation co-efficient calculation was used to calculate co-efficient calculations ($r = 0.79$, $n = 80$). Both the validity and reliability studies consist of 9 items addressed to comprehend the obstacles related to ICT. The survey has a rating capacity of three options; "not an obstacle, [1]", "A serious obstacle [2]" and "Very serious obstacle [3]". The Croanbach alpha value for this scale based on the results of this evaluation is 0.89.

The survey used in the present study was conducted over a period of 6 months between 2003 -2004. Prior to administering the survey, we obtained the lists of the teachers from the schools taking part in the research. Then, random test subject determination was provided from each school and the application process commenced.

After the completion of the survey, each component was reviewed and transferred to a data base. The accuracy of the data was frequently monitored during its transfer to the tabulations. At this stage attempts were made to prevent any inaccurate data transfers. Statistical analyses were done by using SPSS software .Furthermore, statistical transactions required the Point

Intervals Coded according to the Alternatives-(PICA) (3-1=2) (2/3=0,666) (Not obstacle =1,00-1,666; Serious Obstacle =1,667-2,333; Very serious obstacle =2,334-3,00), mean, standard deviation and t test.

The following steps were performed to address the second issue of the study. In the first step, the respondents were determined by grouping separately primary and secondary schools. The number interviewers consist of 54 teachers and 24 principals. 22 of the teachers were from secondary schools and the remaining 32 were from primary schools. The figures for the principals were 8 and 16 respectively. It is worth mentioning that, the teachers and principals of the schools included those who were familiar with ICT.

In the second stage, which developed on the statistical analysis of the answers to the first problem, a list of findings was introduced. These were discussed with the interviewers over a period of time which was previously determined. All the interviews were recorded. The following questions were asked:

- How do these obstacles occur?

- How do these obstacles affect the performance?

- What are your suggestions to overcome these obstacles?

The answers to the above questions were included in the study; the replies for the first 2 questions are stated in the "Findings and Conclusion", whereas those to the last question are to be found in the "Results and Suggestions" section. Naturally, all the answers incorporate the corresponding degree to which the interviewers answered.

Findings and Comment

At this stage of the study, the findings obtained from the scale were presented in three steps; firstly, according to the independent variables of the study. Also, the concern about any specific obstacles which might prove to be a barrier in ICT implementation in the schools will be elucidated upon. Finally, the obstacle factor resulting from independent variables will also be commented upon.

1- The independent variables of the study: 1068 (68.3%) of the respondents were employed in primary schools and 496 (31.7%) in secondary schools. 599 (38.3%) of the respondents were female and 965 (61.7%) are male. 880 (56.3%) of the respondents were employed in the city centers and 684 (43.7%) in the counties. 1402 (89.6%) of the respondents were teachers and 162 (10.4%) were administrators. 995 (63.6%) of the respondents had been employed for 0 to 10 years and 569 (36.4%) for 11 to 20 years. 966 of the respondents (61.8%) received a course on ICT, whereas 598 (38.2%) did not.

2-Obstacle means for the integration of the schools and ICT: According to the responses of the test subjects, overall the mean of the survey was 2.242 and standard deviation was 0.524. As it can be noted, the mean of 2.242 corresponds to the "Serious obstacle" category according to the PICA calculated above. It can be concluded that it had an obstacle profile that might be considered as "serious for the integration of the schools and ICT" according to the answers tied with all the items of the survey.

As can be seen from Table 1, the item most often criticized by the respondents in the analyses of the answers to the survey was that "the budget insufficiency of the school is the main

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obstacle for the integration of the schools and ICT" ($\bar{\bar{X}}$= 2.543; SD = 0.703). This result corresponds to the category of "Very serious obstacle" in the PICA. Accordingly, we can easily say that, the main obstacle for the integration of the schools and ICT was the insufficient budget allocated to ICT. There are several studies emphasizing the negative effects of this shortcoming. (Dawes 1999: 257;Galanouli and McNair 2001:404; Tearle 2003: 575). According to the subjects, ICT systems in the schools were initially set up by a donation or by the Ministry of Education. Therefore, we can argue that a budget is required to update the systems which had been set previously and also, to purchase new technologies and expendable materials. When the ICT budget lacks the required funds, the ICT programme could be hindered .Indeed, new technological equipment cannot be purchased and even the previous system also can not be benefited. Moreover, another item which attracted considerable concern refers to the view that the "Obstacle for the integration of the schools and ICT is lacking of technical support concerning ICT" ($\bar{\bar{X}}$=2.395; SS=.715). This result corresponds to the category of "Very serious obstacle" in the PICA. Accordingly, it is understood that the second significant obstacle for the integration of the schools and ICT was the lack of technical support. Various studies in the literature underline similar findings (Ham 1997: 68; Watson 1997: 19; Pelgrum 2001: 173; Goodison 2002: 211). The subjects revealed that the reason for such an occurrence was the fact that the integration of ICT within the educational system was a recent phenomenon. Accordingly, they emphasize that the authorities in the schools that were in favor for the ICTs were the teachers trained as "the educators of the educators of computer". However, since this group lacked a deep technical knowledge, except for using a few software programme, they couldn't solve any technical problems which might have arisen.

Table 1: Mean and standard deviation of the responds given to the items in the survey

In the integration of the schools with ICT;	N	$\bar{\bar{X}}$	SD
Limitation of budget in the school is an obstacle	1564	2.543	.703
Limited technical support for ICT in the school is an obstacle	1564	2.395	.715
Having limited training of the school staff on ICT is an obstacle	1564	2.312	.699
Low number of computers in the school is an obstacle	1564	2.283	.747
Oldness or slowness of the system related to ICT in the system is an obstacle	1564	2.262	.719
Paucity of educational software in the school is an obstacle	1564	2.187	.716
Low level of interest, drive and being open to changes of city directorships of the Ministry of Education is an obstacle	1564	2.132	.725
Low level of training of the teachers and principles in the schools is an obstacle	1564	2.099	.695
Low level of interest, drive and being open to changes of the teachers and principles in the schools is an obstacle	1564	1.969	.741
Being with obstacle of the school according to overall mean of the expressions (TOTAL)	1564	**2.242**	**.524**

$\overline{X}$ = Mean, SD= Standard Deviation.

"Insufficient training of school staff about ICT" has been seen as an obstacle for integration at the level of "serious obstacle" ($\overline{X}$=2.312; SS=.699) in PICA. A wide selection of studies emphasizing the importance of training the school staff on ICT supports this view (Pelgrum 2001; Ainley et.al. 2002; Goodison 2002; Bryderup & Kowalski 2002). The subjects stated that the applications of the Ministry of Education focused on the training of"the educators of the educators of computer" for a limited time. Unfortunately, the fact remains that besides the limited time involved in the training, which in itself resulted in lack of knowledge, plus the scarcity of computers may have contributed to this obstacle.

"Insufficient number of computers in the schools" has been seen as "serious obstacle" ($\overline{X}$=2.283; SS=.747) in PICA. Although there are numerous studies reporting on similar findings (Pelgrum 2001: 173; Kozma and Anderson 2002: 387; Tearle 2003: 575), the subjects indicated that this failing was attached to the "large number of students, large number of schools and limited sources."

Another "serious obstacle" highlighted by the respondents was the "shortage or slowness of system related to ICT in the school" ($\overline{X}$=2.262; SS=.719) - PICA. According to Knezek et al (2000), successful integration of the schools and ICT is dependent on updating the technological materials. The subjects remarked that there has been an "astounding advances in technology".

We can conclude that "limited educational software in the school" proved to be a "serious obstacle" for the integration of the schools and ICT ($\overline{X}$=2.187; SS=.716). Similarly, a study by Pelgrum (2001:173) commented that the "scarcity of software" was a "serious obstacle" where 54% of those taking part in his study shared this view. In the present study, the subjects indicated that the software scarcity in the schools is linked to the shortfall in the budget, lack of interest of the Ministry of Education in qualitative aspects of ICT, and the incompatibility between the hardware and software. That is to say that the dated and slowness of the systems in the schools related to ICT may be a result of hardware not supporting the current system, or the lack of software compatible for the available hardware. For example, a previous computer hardware provided by the Ministry of Education may not be used with existing new software and vice versa. The subjects also were concerned that this state of affairs complicated the matter as the schools had broadband internet connection. As such, the lack of this inconsistency complicated the matter significantly.

"Educational insufficiency of the teachers and administrators in the schools" exhibits a feature of an obstacle at the level of "serious obstacle" ($\overline{X}$=2.099; SS=.695) in the PICA. This obstacle was reported to be a problem encountered during the integration of the schools with ICT (Fluck 2001: 156; Goodison 2002: 211). In a study by Akpinar (2003), 63.4% of teachers were not using ICT in their educational activities. The subjects reported that the integration process of the schools and ICT in Turkey is still in its infancy. In their view, the obstacle of educational insufficiency is still being felt very profoundly.

The "low level of being open to changes, interest and drive of the city directorships of Ministry of Education" ($\overline{X}$=2.132; SS=.725) and "low level of being open to changes, interest and drive of the teachers and principals in the schools" exhibit a "serious obstacle" ($\overline{X}$=1.969; SS=.741) in the PICA. Top level of managers and staff related to but outside the schools (Selwyn 2000:93; Pelgrum 2001: 173) as well as the principal and staff of the school (Galanouli and McNair 2001: 404; Granger et.al. 2002: 485; Atkins ve Vasu 2000: 280) have important influences on ICT applications in the schools.Indeed, their role is very crucial

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throughout the process. In the subjects' view, the projects of the Ministry of Education on ICT are being ignored by the managers and personnel of the schools and especially by the staff of local education authority in a city. The reasons of this ignorance are related to the low level of salaries of the staff which might influence their motivation in the ICT processes.

3. Means of obstacles according to independent variables: It has to be reminded that the overall mean of the responses was found to be 2.242 and the standard deviation 0.524. Table 2 shows the results of the t test indicating whether these values exhibited significant differences according to the independent variables.

Table 2: The results of the t test and mean for the ICT obstacles according to independent variables

Variables		N	$\bar{X}$	SD	t test	DF	p (sign.)
Type of the schools in which the samples were employed.	Primary	1068	2.238	.538	.449	1562	.653
	Secondary	496	2.251	.495			
Gender of the samples	Women	599	2.220	.543	.301	1562	.193
	Men	965	2.256	.512			
Duration of employment of the samples	0-10 Years	995	2.259	.504	1.698	1562	.090
	11-20 Years	569	2.213	.557			
Location of the schools in which the samples were employed	Urban	880	2.212	.554	2.630	1562	.009**
	Rural	684	2.382	.481			
Obligations of the samples in the school	Teacher	1402	2.232	.534	2.375	1562	.018*
	Principle	162	2.335	.419			
Whether or not the samples received a course on ICT	Yes	966	2.255	.507	1.189	1562	.235
	No	598	2.222	.551			

$\bar{X}$= Mean, SD= Standard Deviation., DF: Degree of freedom, p = significance level

* p < 0.05; ** p < 0.001

Table 2 shows that, opinions of the respondents on the obstacles for the integration of the school with ICT doesn't differ according to the type of the school they were employed in.

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That is to say that the teachers and the principals of the primary ($\bar{X}$=2.238; SD=.538) and secondary schools ($\bar{X}$=2.251; SD=.495) view the obstacles for the integration in the same way (t = .449; p = .653). Although similar and contrasting results exist in Turkey, there are some proponents who suggest that the integration process of schools with ICT was more successful in secondary schools than in primary schools (Doornekamp 2002; 264-268).

When the answers were analyzed according to the gender of the respondents, we could not detect any difference in both women ($\bar{X}$ = 2.220; SD = .543) and men ($\bar{X}$=2.256; SD = .512) on the obstacles (t = .301; p =.193) as we found similarities throughout. This outcome complements the literature where some studies indicate that the views on ICT were shared by both male and females. (Collis et.al. 1996; Isman 2002; Galanouli et.al. 2004).However, others emphasized that women held less positive attitudes on ICT (Spennemann 1996; Ory 1997).

We can also easily say that, the duration of employment of the teachers and the principals didn't make a difference in stating their opinions related to the "obstacles". Both the staff who were newly employed ($\bar{X}$=2.259; SD = .504) (Wild 1995; Watson 1997; Murphy ve Greenwood 1998; Strudler et.al. 1999) and those who have been working for many years ($\bar{X}$ =2.213; SD = .557) (Isman 2002) shared similar views. In regard to the means, the negative percentage of those who were newly employed was higher. Simply put, the latter conceded that there were more obstacles, although this difference was not statistically significant. A similar result was supported by the studies by Tsitouridou and Vryzas (2003) and by Galanouli et al (2004). This result may have contributed to the fact that teachers and principals cannot find the appropriate environment to perform their skills and knowledge although they had had competency on ICT in their processes of pre-employment education (Fisher 1997; Sheffield 1998).

As can be seen in the Table 2, the process of this integration programme is influenced by the locations of the schools where the respondents were employed. In fact, the urban and rural locations reflected on the opinions tied to the integration process. Acordingly, a teacher or administrator in the rural areas ($\bar{X}$=2.382; SD = .481) sees the process of integration as having more obstacles than those who work in urban ones.212; SD = .554) (t = 2.630; p = .009). There may be some differences in ICT application within the same country and it is not radical to say that the urban parts are at an advantage (Harding 2002; Hartviksen et al; 2002). Thus, deprivation of those employed in the rural parts may be interpreted as a reason for this contention.

When it was investigated whether the particular positions the respondents held in their school made any difference in how they viewed ICT, administrators ($\bar{X}$=2.335; SD = 0.419) tended to see the process of ICT as having more obstacles than teachers did ($\bar{X}$=2.232; SD = 0.534) (t = 2.375; p = 0.018). This may be due to the fact that the initial place to test ICT, most of the time happened to take place in the administration's office (Mc Cannon & Crews 2000). The fact remains that principals had the administrative responsibility and authority in the schools. In other words the principal's responsibility is to create the right conditions for ICT. Hence, teachers might resist ICT applications (Ely 1993; Dawes 1999; Granger et al 2002; Zhao and Cziko 2001; Hu, Clark and Ma. 2003) may be considered as reason for such a result.

Finally, it emerged that the respondents who had attended a course in ICT (X=2.255; SD=0.057) and those who didn't (X=2.222; SD=0.551) view the obstacles of the integration process in the same way (t = 1.189; p = 0.235). Although the judgment on ICT is influenced by the ICT experiences (Necessary and Parish 1996; Potosky and Bobko 2001; Memmedova

and Seferoglu 2001), this result indicates that the obstacles which are linked with the integration process are still accepted by those who lacked ICT training.

Results and Suggestions

A number of studies emphasized that the ICT-based education increased the success level when compared with that traditional (Hacker and Sova 1998; Lee 1998; Renshaw and Taylor 2000; Chang 2002; Mioduser et al2002). Accordingly, it is obvious that those concerned with ICT should integrate ICT with their duties in the schools in order to educate the individuals who belong to an information society. An international study underlined that this was achievable (Silvin-Kachala 1998;Wenglinsky 1998; Mann et al;1998)), but the most important step in conducting this integration in a professional manner is to firstly detect and eliminate the obstacles that are bound to be encountered.

Similarly, in Turkey there are some obstacles which hinder ICT integration. Unless these obstacles are detected and prevented appropriately, every kind of attempts that the Ministry of Education will make would be a failure from the start. In the context of the findings of this study, the obstacles read as follows starting with the decreasing order of importance: ICT budget limitations; scarcity of technical support resources of the school staff to be trained in ICT, the limited number of computers, outdate ness/slowness of the system related to ICT , limited numbers of educational software, resistance in being open to changes, interest ad drive of the city directorships of the Ministry of Education, educational expertise of the teachers and principals and the defiance of being open to changes, interest and motivation of both teachers and principals.

This order of importance detected from results of the present study may also provide clues to what should be given priority by the school administrators and other institutes in the integration process of ICT. In regard to the findings of this study, it is clear that the obstacles, especially, those encountered in the rural areas and by the teachers, should be emphasized as being at the root of these obstacles.

In the context of the results of the present study, preventive measures could be taken to overcome the obstacles which hinder the integration process.Indeed, it would make sense to take into consideration the literature, reports and the opinions of both teachers and principals who after all encounter these problems directly. As such, this will help us gain a better perspective.

According to the subjects a financial source, "Budget of School-ICT Integration" should be allocated to the schools for resolving the problems in the integration process. Utilizing this budget should be under the control of an "ICT Board" headed by the principals and their assistants.

An ICT expert is required in every school to overcome the technical problems linked to ICT integration. Lim et al (2003) noted that a group of experts should be present in each school so that any problems could be prevented.

The subjects reported that in order to overcome the scarcity of training possibilities of the school staff in ICT "ICT Training Centers" should be founded in each city. As such, the principals/teachers would be trained and have the opportunity to develop on their skills, instead of training "only once" during their formation training. Numerous studies argue that it should be a must to train teachers in ICT (Hancock 1997; Imer 2000).

It is possible to overcome the problem of the lack of computers in the schools by increasing their numbers (Dawes 1999: 19). The subjects stated that this obstacle might evaporate as a consequence of inexpensive technology on the market, and the decrease in the population.

Attempts are needed to improve the educational software both qualitatively and quantitatively in order to overcome the obstacles that may appear as a result of the problem of scarcity of educational software (Ardil 2003). In doing so, it would be reasonable to improve the software on the basis of specialized knowledge of the educational sciences in order to improve on the quality of these attempts. On the other hand, it is reasonable to say that purchasing process of software that could be used in all schools should be conveyed by the Ministry of Education and the development of software should be supported (Arslan 2003: 8).

One way to eliminate the problem of outdated ness and slowness related to ICT in the schools is to provide a balance between the hardware and software. This should be based on comparing the operability of the available hardware and software and the differences made in implementing the new one. Accordingly, it would be reasonable to renew the hardware and software if it is found to be necessary(Maheshwari1997). Moreover, it is necessary to make serious attempts in connecting all schools to the Internet.

In order to eliminate the problem of educational insufficiency of the teachers or principals in the school, several actions should be taken. Notably, at university level the training of teachers in ICT would bear fruit on their lessons. Another measure could involve in-service training which should be more systematic (Hancock 1997:63).This implies providing a profession with more exposures, ranging from the lessons' content, the location in which the lessons are given plus the motivation of the educators. The principals involved in the in-service training programs might be another factor to consider, as their main responsibility is to lead teachers in implementing ICT in each school.

All school staff teachers and those who have the final say from the Ministry of Education should be made aware of changes. Moreover they should be involved in systematic activities to increase their interest and motivation. Incorporating these factors will make the integration efficient (Mooij 2004:42).According to the subjects in the present study, an increase in their salaries would be an important step.Indeed, this would provide them with an opportunity of owing their own computers. Furthermore, they emphasized that guiding them through the application process would also increase their interest and motivation.

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