Perceptions of Teachers Regarding Qualifications of Key Technology Players in Their Institutions

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Abstract: Teachers usually have problems in accessing people who can help them integrate technology into classroom activities and provide them with technical assistance whenever they are in trouble. Such assisting tasks are mostly fulfilled informally and voluntarily by tech-savvy individuals in the institution who try to use technology, encourage their colleagues and help them in terms of technology use. These individuals performing key duties are named Key Technology Player (KTP) in the current study which investigates the perspectives of teachers regarding qualifications of key technology players in educational institutions. Teachers were administered a questionnaire involving basic qualifications of a KTP to determine whom they consider as KTPs. Potential KTPs are identified as administrators, computer teachers, other teachers and nobody in the questionnaire. In order to determine the participants, cluster sampling was administered in Eskişehir, Turkey. The questionnaire was administered to 148 teachers from four K-12 institutions. Perspectives of teachers on people whom they consider as KTPs were also compared between administrators and computer teachers, administrators and other teachers and computer teachers and other teachers. Findings revealed that administrators got more votes than computer teachers and other teachers in terms of planning, leadership, collaboration, guidance and support. Computer teachers received the highest amount of votes in terms of technology skills. Paired-samples t-tests revealed that administrators and computer teachers did not differ in terms of their KTP qualifications, whereas administrators and other teachers and computer teachers and other teachers differed at a statistically significant level.

Key words: Key technology player · K-12 institutions · computer teachers · educational technology

INTRODUCTION

Using tools of Information and Communication Technologies (ICTs) has been a necessity for education, employment and everyday life use. On the other hand, rapid technological developments make it impossible to follow all up-to-date technologies. New approaches and implications regarding integration of these technologies into classroom settings develop as fast as the technological innovations. Thus, it is not surprising that a great emphasis placed on ICT integration and huge amounts of investment is done to develop ICT-related infrastructure and in-service training. Several countries develop and modify their plans and policies in a way to integrate ICTs into educational activities [1]. Along with the integration of ICTs into classroom settings, emergence of information economy makes educational endeavors attract more attention.

ICT integration in education: Increasing expectations from educational institutions along with the lack of proper undertakings to meet these expectations make it necessary to integrate technology into educational endeavors. Administrators and teachers are obliged to transform their institutions to a learning community where the ICT integration process is successfully implemented. Many administrators and teachers feel the necessity to integrate technology into every content type and student level [2]. Instructional innovations regarding ICTs are integrated into educational reforms which aim to equip learners with several skills including communication, collaboration, individual learning.

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problem-solving, information retrieval and analysis and critical thinking most of which had not been emphasized in former instructional programs [3].

Technological indicators of educational implementations do not always work as they are expected to. Several barriers interfere with the ICT integration process such as pedagogical problems, equality issues, insufficient in-service training and insufficient leadership [2]. Administrators who are considered as the technology leaders in educational institutions have important responsibilities in terms of these barriers. Examining these barriers with an emphasis on technology leaders is important to understand the notion of KTP better.

**Pedagogical problems**: The paradigm shift towards the learner-centered approaches emphasizes the importance of interaction during instruction, providing learner-based content, supplying authentic instruments and genuine evaluation, sustaining technology access, ease of use and technical assistance. Such a transformation process makes it necessary to focus on technology use in teacher training [4].

One of the genuine indicators of technology effectiveness in instructional endeavors is the ability of relevant technology and programs to encourage and support active and collaborative learning. This indicator also involves accommodation of teachers to new learning settings which place an emphasis on cooperative and collaborative learning, reflective thinking skills and learning by doing. Such a change in the notion of learning context changes the roles of teachers, managers and students as well [5]. Instructional use of technology is not ideally realized even by new graduates of the colleges of education. As opposed to the common belief, pre-service and beginning teachers are not more effective than experienced teachers regarding effective instructional technology implementation. Even though the beginning teachers are more competent in using new technologies, they constantly have problems in integrating this technology knowledge into effective instructional endeavors [6, 7]. Thus, both administrators and other teachers who serve as key players in the technology integration process perform important roles.

**Equality issues**: Equal access opportunities constitute one of the most important problems regarding ICT integration in educational institutions. A technology supported instructional endeavor should provide equal opportunities to all learners regarding access and simultaneous use of facilities. Since technology allows the educational institutions to connect with a rich variety of resources outside the schools, the level of access and equality affects the learners' chance to make use of these resources. If a school wants to benefit from rich and cheap information resources, necessary infrastructure and connections between the school and the information resources should be established properly. A robust local area network and high speed Internet connection allowing synchronous communication helps the learners access the best, the most commonplace and the most up-to-date resources. If a school system has a local area network but no local digital library, or if a system is in a situation where higher levels of students can make use of IT resources while others do not have such a knowledge, this means that there are problems in terms of equality. In order for every learner to benefit from rich and motivating learning opportunities, they should have equal chances to use technological facilities in schools [5]. Rich access opportunities and technological infrastructure are compulsory for effective ICT integration yet they are not the only conditions. That is, having rich technological infrastructure rarely means that these resources are used effectively by teachers and learners [8]. Supplying computers and networks at schools is not sufficient for appropriate educational reforms. In this respect, both school administrators and key technology players have significant responsibilities. More specifically, their level of awareness regarding ICT integration along with the barriers to the integration process and their behaviors regarding how to implement their experiences to solve the barriers to ICT integration carry utmost importance [2].

**Insufficient in-service training endeavors**: Professional development is one of the notions affecting successful ICT integration. Thus, constant professional development is an issue to take into consideration in educational institutions. Constant professional development is an important need for educational institutions which are both obliged to change and urge the change. However, it should be taken into account that in order to sustain the durability of this process, it is crucial to operate some principles including voluntary participation, fulfillment of needs, appropriateness to adult education, constant evaluation and support [9]. Organizing professional development activities and making technology one of the subject matters are important for development. Since professional development plays a key role in using technology for instructional purposes, it is
important that the technology leader is among the first and most important practitioners dealing with professional development. In this respect, in order to support technology leaders’ role of professional mentorship, they need an additional training [10].

**Insufficient leadership:** A common assumption at educational institutions is that administrators have the leading role in technology use. Even though they do not have necessary competencies regarding ICT integration, they are assigned the leading role by the employees. However, leadership means a lot more than finding and managing resources [2]. Thus, leadership in terms of technology is considered as a multifaceted issue in the current study. According to the South East Initiatives Regional Technology in Education Consortium [11], leadership is among the most important factors affecting technology integration on its own. Studies conducted in K-12 settings by SEIRTEC indicate that educational institutions with the highest levels of development in terms of ICT integration are those which have active and participating leaders. Stegall [12] also states that even though schools might differ in terms of participation, location and financial opportunities, leadership makes the highest effect on the integration process. Most administrators are novice technology users who have either insufficient education regarding ICTs or meager experience to become effective technology leaders. Even though most administrators understand the importance of using and supporting technology based instructional endeavors, it seems that the notion of leadership is not being emphasized sufficiently. Mehlinger and Powers, 2002 in Ertmer et al. [12].

**ICT integration and leadership:** Technology leadership can be defined as supporting and encouraging teachers of an institution in terms of ICT integration [12]. Few studies in the literature focus on ICT integration with an emphasis on its relationship with educational leadership. Most studies provide implications to help school administrators in implementing ICT principles better. Besides, few empirical studies are conducted to investigate the roles of school administrators in ICT integration. However, there is a vast literature indicating that successful endeavors and innovations at educational institutions mostly stem from skilled administrators. More specifically, administrators who encourage and support change constitute a significant factor supporting successful reforms [13-16]. In addition, their guidance and support behaviors while working with teachers who implement educational developments and changes carry utmost importance [18].

**Importance of the KTP for the Educational Institution:** Few instances of the term ‘key technology player’ are reached through the literature review. The notion of technology leadership is mostly used identically with school administrators and principals in a way to shelter the term key technology player. For instance, Adamy and Heinecke [17] investigated factors affecting ICT integration into teaching and learning endeavors and found out that KTPs and interaction among educators are among the most important factors.

KTPs lead the activities requiring technology use in their institutions. These individuals mostly emerge informally through unique dynamics of the institutions. Most institutions need individuals serving as KTPs. Since information regarding technology use develops rapidly, there is a need for individuals to support and help other educators in terms of following new technologies, accommodating them and using them in classroom activities. In this respect, most employees in educational institutions have an inclination to consider school administrators as effective technology users, technology planners, infrastructure providers, supporters and technology integration leaders. However, all these responsibilities are somewhat hard to fulfill since school administrators have too many additional roles to allocate necessary time and support for ICT integration. Thus, school administrators need colleagues to share their responsibilities in terms of technology integration.

Teachers cannot always find individuals to help them whenever they have problems in integrating technology into classroom activities. Such a crucial assisting task is mostly fulfilled informally and voluntarily by skillful individuals in the institution who try to use technology, encourage their colleagues and help them in terms of technology use. However, ICT integration is a serious issue. Any problems emerging during the integration process might de-motivate both teachers and students. Such an important process requires formally assigned individuals to serve as KTPs in educational institutions. Computer teachers mostly serve as KTPs since they have the necessary competencies to fulfill the roles of KTPs. The current study tries to investigate who have the abilities to serve as KTPs and to assist school administrators and employees of the institution in integrating technology into educational endeavors.
Purpose of the study: The current study aims to determine whether the graduates of Computer Education and Instructional Technologies (CEIT) departments in Eskisehir are considered as key technology players by their colleagues. To realize this purpose, following research questions will be addressed:

1. How is the current situation of computer teachers, school administrators and other teachers in terms of having qualifications of key technology players?
2. Do employees’ opinions regarding KTPs differ between:
   - Computer teachers and administrators
   - Computer teachers and other teachers
   - Administrators and other teachers

METHODS

This part provides information regarding the research model, participants, data collection tools along with reliability and validity precautions and procedures followed for data analysis.

Research model: The study follows a descriptive research model in which graduates of the departments of Computer Education and Instructional Technologies (CEIT) were particularly investigated to see whether they are considered as key technology players in their institutions.

Participants: The reference population of the study is all state-funded K-12 institutions in Eskisehir which employ graduates of CEIT departments. Cluster sampling was realized through selecting an equal proportion of primary, secondary and high schools from the reference population which was followed by random selection from these clusters.

Data collection tools: In order to collect data addressing the research questions of the current study, employees of the schools involved in the sample were administered a questionnaire. The questionnaire involved indicators regarding qualifications of KTPs. Delphi method was administered to determine qualifications of KTPs. Five experts were interviewed regarding qualifications of KTPs. Through a detailed content analysis, basic qualifications of KTPs were determined by the researchers which were summarized under 12 statements. Along with 12 statements regarding qualifications of KTPs, some demographic questions including gender, seniority and type of the institution were asked in order to make comparisons and relevant parametric tests. Potential individuals who might the skills to fulfill given qualifications are listed as ‘administrator’, ‘computer teacher’, ‘another teacher’ and ‘nobody’ in the questionnaire. Participants were allowed to select more than one option for each qualification. Votes of administrators, computer teachers, other teachers and nobody were added for further evaluations. The internal reliability of the questionnaire is calculated through Cronbach’s Alpha which was acceptable (α=0.894). Expert opinion was considered sufficient for content and face validity.

Findings and interpretation: The data analysis in the study was conducted through SPSS 10.0 for Windows. The critical significance value was determined as 0.05 at the inception of the study.

How are the current situations of computer teachers, school administrators and other teachers in terms of having qualifications of key technology players?

In order to answer this research question, votes received by administrators, computer teachers, other teachers and nobody, were computed. Descriptive statistics including frequencies and percentages are provided in Table 1.

As indicated in Table 1, in terms of being competent in using technology in their institutions (Item 1), administrators and computer teachers have a total of 110 votes. Of 148 participants, 110 employees (74.8%) think that computer teachers are competent in using technology in their institutions. However, the amount of votes received by the administrators is equal to those of computer teachers, which is interesting. The option named another teacher has 74 votes (50.3%), which is eye-catching as well. These findings suggest that there are sufficient employees to serve as KTPs in educational institutions examined in the current study. The option named ‘nobody’ constitutes only two percent of the total votes which also indicates that at least 98% of the participants think that there is at least one person to serve as KTP.

The second item addresses the qualification of contributing to the technological structuring of the educational institution. Administrators had the highest amount of votes for this indicator (79.7%). Since this qualification is mostly related with planning and educational administration, it is not surprising that administrators got the highest amount of votes. Computer
Table 1: Frequencies and percentages of votes received by administrators, computer teachers, other teachers and nobody

<table>
<thead>
<tr>
<th>Indicators Regarding KTP Qualifications</th>
<th>Administrator</th>
<th>Computer teacher</th>
<th>Another teacher</th>
<th>Nobody</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competent in using technology in our institution</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>2. Contributes to the technological structuring of our institution</td>
<td>110</td>
<td>74.8</td>
<td>110</td>
<td>74.8</td>
</tr>
<tr>
<td>3. Contributes to the technology use</td>
<td>118</td>
<td>79.7</td>
<td>66</td>
<td>44.6</td>
</tr>
<tr>
<td>4. Constantly helps me use technology</td>
<td>101</td>
<td>69.2</td>
<td>76</td>
<td>52.1</td>
</tr>
<tr>
<td>5. Constantly encourages me to use technology</td>
<td>57</td>
<td>39.3</td>
<td>66</td>
<td>45.5</td>
</tr>
<tr>
<td>6. Guides me in terms of technology use</td>
<td>74</td>
<td>50.7</td>
<td>39</td>
<td>26.7</td>
</tr>
<tr>
<td>7. Pioneers employees in terms of using new and different technologies</td>
<td>74</td>
<td>50.3</td>
<td>40</td>
<td>27.2</td>
</tr>
<tr>
<td>8. Knows the technological hardware well</td>
<td>85</td>
<td>57.8</td>
<td>47</td>
<td>32.0</td>
</tr>
<tr>
<td>9. Knows the computer software well</td>
<td>53</td>
<td>36.1</td>
<td>89</td>
<td>60.5</td>
</tr>
<tr>
<td>10. Has the skills to understand and solve technology-related problems</td>
<td>43</td>
<td>29.3</td>
<td>97</td>
<td>66.0</td>
</tr>
<tr>
<td>11. Develops new ideas regarding integration of technology in teaching-learning endeavor</td>
<td>58</td>
<td>39.5</td>
<td>83</td>
<td>56.5</td>
</tr>
<tr>
<td>12. Shares the new ideas regarding technology use with other employees</td>
<td>35</td>
<td>23.6</td>
<td>70</td>
<td>47.9</td>
</tr>
</tbody>
</table>

teachers ranked the second in terms of this indicator with a considerable percentage as well (44.6%). Other teachers had 18.9% of the votes. These findings suggest that in terms of contributing to the technological structuring of the educational institution, administrators are considered more competent than other teachers in the institution.

The third item addresses the qualification of contributing to the technology use in the institution. Administrators had the highest amount of votes in this item as well (69.2%). Computer teachers ranked the second with 52.1% of the votes. It is interesting that other teachers had 27.4% of the votes. These findings suggest that in terms of contributing to the technology use in the institution, all employees serve as key technology players to some extent. Only 6.2% of participants think that there is nobody in their institutions with the qualification of contributing to the technology use.

The fourth item addresses constantly helping others use technology. Even though computer teachers have the first rank with 45.5% of the votes, administrators (39.3%) and other teachers (33.1%) are quite close to computer teachers. Besides, the percentage of the option ‘nobody’ (18.6%) is quite interesting. This item suggests two things. First, in terms of helping others use technology, all employees have close inclinations. Second, 19% of the participants indicate that they have problems in receiving necessary help in terms of using technology.

The fifth item of the questionnaire addresses the qualification of constantly encouraging others to use technology. The highest amount of votes belonged to the administrators (50.7%). Interestingly, the ‘nobody’ option (28.1%) was clearly preferred more than the computer teachers (26.7%) and other teachers (20.5%). These findings suggest that teachers have problems in terms of receiving necessary motivation, encouragement and support from others. More specifically, 28.1% of participants indicate that they see no encouragement from their colleagues.

The sixth item of the questionnaire addresses the qualification of guiding other colleagues in terms of technology use. Administrators had the highest amount of votes again (50.3%). The interesting finding comes from the ‘nobody’ option again. This option had 26.5% of all votes which was close to both computer teachers (27.2%) and other teachers (23.1%). These findings suggest that administrators serve as key players in guiding other employees in terms of technology use whereas computer teachers kind of fail in terms of this qualification. The most serious finding for this item was that approximately 27% of participants reported that they had no guidance from their colleagues.

In terms of pioneering employees in using new and different technologies (item 7) administrators had the highest amount of votes again (57.8%). They are followed by computer teachers (32%) and other teachers (20.4%). The ‘nobody’ option had 18.4% of the votes. These findings suggest that administrators mostly pioneer other employees in using new and different technologies whereas 18 percent of the participants feel that nobody pioneers them in using new technologies.

The eighth item of the questionnaire addresses knowing the technological hardware well. For the first time, computer teachers had the highest amount of votes (60.5%). This was followed by administrators (36.1%) and other teachers (26.5%). Of respondents, 16.3% think
that nobody knows the technological hardware well. It is not surprising that computer teachers had the highest amount of votes in terms of knowing the hardware. However, previous items reveal that they are not good at disseminating their knowledge to their colleagues. Finally, it is good to know that approximately 84% of the participants claim that there is somebody around who know technological hardware well.

In terms of knowing the computer software (item 9) computer teachers had the highest amount of votes again (66%). They were followed by administrators (29.3%) and other teachers (20.4%). Unfortunately, 17.7% of the participants think that nobody knows the computer software in their institutions. Even though computer teachers are rated as knowing computer hardware and software well, the percentage is not high enough which indicates that they are either not good at disseminating their experience to whole institution or the context is not appropriate for them to share their experiences with others. However, the fact that 83% of participants felt that there is somebody in their institution knowing the computer software well is a positive finding.

The qualification of having the skills to understand and solve technology-related problems (item 10) was mostly attributed to computer teachers with 56.5% of all votes. They are followed by administrators (39.5%) and other teachers (27.2%). Unfortunately, 16.3% of the participants think that nobody among their colleagues has the skills to understand and solve technology-related problems. Computer teachers rank the first in having the relevant skills but the low percentage suggests that they are not good at sharing their skills with others.

The eleventh item of the questionnaire addresses the qualification of developing new ideas regarding integration of technology in teaching-learning endeavors. Computer teachers had the highest amount of votes in this item as well (47.9%). They are followed by administrators (35.6%) and other teachers (28.1%). Unfortunately, 23.3% of participants think that nobody develops new ideas regarding integration of technology into teaching. Pedagogical problems mentioned in the literature review seem to be valid in the current sample as well. Computer teachers seem to be good KTP candidates even though they are not that good in disseminating their knowledge to other colleagues.

The final item of the questionnaire addresses the qualification sharing new ideas regarding technology use with other employees. Computer teachers had the highest amount of votes in this item as well (45.2%). Administrators’ percentage was very close to that of computer teachers (44.5%). The percentages of other teachers (24%) and nobody (24.7%) were quite close as well. In order to create learning communities where constant professional development and in-service training are sustained, developing and sharing new ideas regarding ICT integration are quite important. It is pleasant to see that both computer teachers and administrators are good at sharing their ideas with other colleagues. However, it is quite unfortunate that 24% of the participants think nobody shares their ideas with others.

Indicators mentioned here regarding KTP qualifications can be summarized within five titles, namely;

- Planning
- Leadership
- Guidance and support
- Collaboration
- Technology knowledge and skills

While computer teachers were better at technological knowledge and skills; administrators were considered more effective in terms of leadership, planning, guidance and support. In terms of some qualifications of key technology players, administrators and computer teachers had very close votes (Items 1, 4 and 12). When all indicators are taken into account it is observed that other teachers had lower votes than both administrators and computer teachers. More specifically, it can be suggested that teachers allocate roles of key technology players between administrators and computer teachers. However in order to see whether computer teachers, administrators and other teachers differ from each other in terms of each KTP qualifications, further parametric tests are necessary.

Do employees’ opinions regarding KTPs differ according to educators’ roles?: In order to answer the second research question of the study, educators were compared with each other in terms of their total scores from 12 items in the questionnaire. As mentioned before, participants voted administrators, computer teachers and other teachers in the questionnaire. Since three types of data come from the same individual, comparisons among those columns will require a within-group analysis, which will be conducted through dependent-samples t-tests in the current design.
Table 2: Paired-samples t-test comparing votes given to computer teachers and administrators

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>156</td>
<td>5.92</td>
<td>3.96</td>
<td>135</td>
<td>0.037</td>
<td>0.971</td>
</tr>
<tr>
<td>Administrators</td>
<td>156</td>
<td>5.90</td>
<td>3.85</td>
<td></td>
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</tr>
</tbody>
</table>

Table 3: Paired-samples t-test comparing votes given to computer teachers and other teachers

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>156</td>
<td>5.90</td>
<td>3.85</td>
<td>135</td>
<td>7.151</td>
<td>0.000</td>
</tr>
<tr>
<td>Other teachers</td>
<td>156</td>
<td>3.13</td>
<td>2.96</td>
<td></td>
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</tbody>
</table>

Table 4: Paired-samples t-test comparing votes given to administrators and other teachers

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrators</td>
<td>136</td>
<td>5.92</td>
<td>3.96</td>
<td>135</td>
<td>7.149</td>
<td>0.000</td>
</tr>
<tr>
<td>Other teachers</td>
<td>136</td>
<td>3.13</td>
<td>2.96</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Computer teachers vs. administrators:** Votes given to computer teachers and administrators were compared through a dependent (paired)-samples t-test whose results are summarized in Table 2 below:

As indicated in the table, the calculated t-value is not statistically significant. In other words, computer teachers did not differ from administrators in terms of having qualifications of key technology players.

**Computer teachers and other teachers:** Votes given to computer teachers and other teachers were compared through a paired-samples t-test whose results are summarized in Table 3 below:

As indicated in the table, the calculated t-value is statistically significant (p<0.001). Computer teachers significantly differed from other teachers in terms of having qualifications of key technology players. More specifically, their mean (5.90) was statistically higher than the mean of other teachers (3.13), indicating that they are considered better in terms of having qualifications of KTPs.

**Administrators and other teachers:** Votes given to administrators and other teachers were compared through a paired-samples t-test whose results are summarized in Table 4 below:

As indicated in the table, the calculated t-value is statistically significant (p<0.001). Administrators significantly differed from other teachers in terms of having qualifications of key technology players. More specifically, mean of administrators (5.92) was statistically higher than the mean of other teachers (3.13), indicating that they are considered better in terms of having qualifications of KTPs.

**CONCLUSIONS AND SUGGESTIONS**

This study investigated the perspectives of K-12 teachers regarding who have the qualifications of key technology players in their institutions. A 12-item questionnaire was administered which examine these qualifications under five titles, namely, planning, leadership, guidance and support, collaboration and technology knowledge and skills.

Regarding technology-related knowledge and skills, computer teachers had higher votes than the other groups. However, their votes regarding technology-related skills did not surpass 66% except for the first indicator. This might mean that computer teachers are either incompetent in disseminating their experiences or the context is not appropriate for creating such a learning community.

As Planagan and Jacobsen [2] indicated, insufficient in-service training and professional development endeavors are among the barriers to successful ICT integration. Findings of the current study suggest that most of the key technology player roles are realized by computer teachers; however, participants attribute these roles to administrators as well. In this respect, administrators also need to participate in professional development activities to fulfill their roles better. Moreover, 25% of the participants claim that there is nobody to fulfill crucial ICT integration roles, which requires immediate action in terms of professional development.

In terms of KTP qualifications involving planning, leadership, collaboration, guidance and support, administrators had higher votes than computer teachers and other teachers. More specifically, employers mostly reconcile these roles with the administrators. However, computer teachers’ votes were quite close to those of administrators in many items. These findings reveal that teachers investigated in the current study mostly attribute key technology player roles to both administrators and computer teachers. Such a finding is supported by the results of the paired-samples t-tests as well. The tests indicated that in terms of having qualifications of KTPs, computer teachers and administrators did not significantly differ from each other whereas these two groups had significantly higher means than other teachers. As mentioned before, pedagogical problems, equality
issues, insufficient in-service training and insufficient leadership were considered as barriers to successful ICT integration [2]. In this respect, both computer teachers and administrators have important roles in overcoming these barriers.

Findings also reveal that teachers have significant problems in terms of receiving necessary support and encouragement for technology use and integration. Teachers' responses imply that they have problems in terms of professional development, establishing effective learning communities and collaborating with their colleagues. In order to overcome such problems, a technology support service might be established in educational institutions in order to help teachers integrate ICTs into their classroom activities, participate in constant professional development and collaboration regarding technology integration. Such a service might be managed by the graduates of Computer Education and Instructional Technologies (CEIT) departments. In addition, professional development activities might be emphasized to support school administrators so that they can serve as better technology leaders. Finally, administrators' role should not be considered as merely providing necessary technical support and infrastructure. Rather, they are key players in sustaining planning, leadership, collaboration, guidance and support.

REFERENCES


