SUPPORT SYSTEM OF TECHNOLOGY ENHANCED LEARNING INAN EDUCATIONAL INSTITUTION

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Abstract

The main elements of support system while promoting TEL in an educational institution are discussed in this paper. While integrating TEL in an educational institution it is necessary to ensure technological support and resources for bothteachers and learners, organizational support, pedagogical support for teachers, peer and information advice and guidance support for learners. If an appropriate support system is implemented, the use of technologies will lead to a more efficient, acceptable, better processed and effective learning. Research results in a VET organizationhave shown that teachers do not get sufficient technological support, while organizational support needs enhancement. Best evaluated was pedagogical support, but teachers still need support while using web conference tools, social networks, mobile tools, as these tools are rarely used in the teaching process.

Keywords: Technology enhanced learning, support system, teacher, vocational education and training organization (VET)

Introduction

Technology enhanced learning (TEL) is used extensively throughout the educational world and usually it is used to describe the application of information and communication technologies (ICT) to learning and teaching (Price, Kirkwood, 2010). The communication from the European Commission (Opening up Education, 2013) stresses the need of all educational institutions to improve capacity to adapt, promote innovation and exploit the potential of technologies and digital content. If institutions have willingness to change and are ready to introduce organizational models and

structural changes they grasp the opportunities that TEL provides. On the other hand TEL application to educational institutions' needs changes by introducing proper policies of organization, also management decisions supporting TEL, in-service training of teachers, creating on line learning communities, strengthens students' guidance and providing appropriate technological and informational support.

The aim of the researchis to discuss the elements of support system in an educational institution while integrating technology enhanced learning and to evaluate which kind of support is necessary for teachers of a particular VETorganization.

The importance of support system for TEL

Technology has enabled highly effective information search and storage and therefore there is no point for people to passively gather and remember information. Today all information is available online, in computer files, etc. Any time this information can be acquired by using search engines such as Google, which only requires Internet connection, and the retrieved information can be used immediately or stored in a hard-drive.

Learning how to use technology is a challenge for teachers and learners, but TEL raises manymore challenges than learning a new software programs. Olapiriyakul andScher (2006) state that online course requires more time for preparation than traditional course.Researchersalso add that usage of Web-based technology requires more finances and deeper knowledge of technology.Kyei-Blankson (2010) agrees with Olapiriyakul and Scher (2006) andstates that not only time, finances and knowledge is necessary, but also teachers and learners need to overcome frustration if the technology is not functioning well. Furthermore, a lack of support from the institution and peers are a great challenge (Kyei-Blankson, 2010).

Integration of TEL in an educational institution is a significant change for teachers and learners. Lack of support in the process can be a predictor of failure and eventually integration of TEL could prove unsuccessful.That is why educational institutions must have well developed support systems while integrating TEL.

According toOlapiriyakul and Scher (2006) and Kyei-Blankson (2010) support is necessary for both teachers and students (Fig. 1). While integrating TEL in an educational institution teachers will need organizational and pedagogical support; peer support and information and guidance is compulsory for learners; and both teachers and learners will need some kind of technological support and resources.

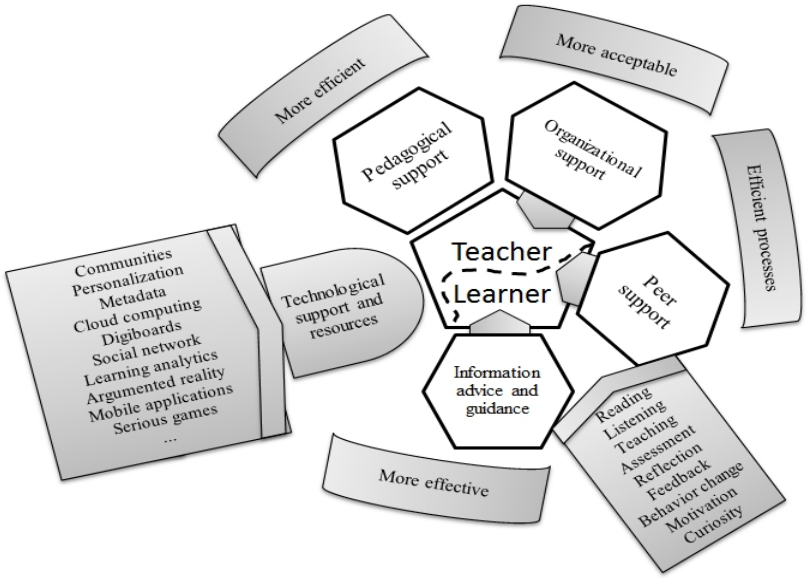

Figure 1. Support system of TEL integration

Technological support and resources. The wider possible range of modern technologies is offered for teachers and learners to use in the learning process, the more effective learning outcomes we will get. Even the process of learning and teaching will be more interesting and successful. In general, most technologies relevant for educational settings extend current limitations of access to information and enable ubiquitous and seamless information access (Specht, Klemke, 2013).

Olapiriyakul and Scher (2006) summarize three types of technology that are required for an effective TEL course. Firstly, there is a need to have an adequate technology infrastructure that "consists of network facilities and database resources that enhance connectivity and links of various learning and pedagogical technologies together, to support new learning modality" (p. 295). Secondly, there is a need to support teachers by instructing them how to use technology effectively.

Thirdly, technology in learning is needed to support the student and provide an opportunity to learn and interact with teachers and peers.

Specht, Klemke (2013) name the main six tools which are used for learning: Mobiles, Cloud Computing, Geo-Everything, the Personal Web, Semantic-Aware Applications, and Smart Objects.

Mobiles and smartphones become more and more universal tools for didactical purposes and apps. The multipurpose usage of mobile devices can be structured according to their educational functions.These tools support: mobile content and LMS access, personal notification systems, response systems either in Classroom Response Systems or in distributed

collaboration systems, data collection tools for documentation of learning experiences (Specht, Klemke, 2013). Mobile technology enables linking of informal learning and non-classroom activities with traditional learning. The cloud gives new possibilities for the development of learning support and for overcoming of the existing problems of time and location. It allows a truly ubiquitous learning experience. There are some educational effects of mobile learning games researched, mostly in the cognitive and emotional learning. Current technology developments enable a more integrated learning support in sensing the current learner's context and giving a real-time feedback on the learner's behavior. This can lead to a more efficient and effective learning when the relevant data about a user's behavior is brought together in a meaningful way, combined and implemented in instructional strategies and indicated in an intuitive, meaningful, and stimulating way.

Pedagogical support is necessary for the teacher, as technology itself does not change the way of teaching. TEL integration requires teachers to develop their teaching processes. Olapiriyakul and Scher (2006) state that a very important aspect that increases course efficiency, attractiveness, student engagement and overall student satisfaction with the course is experience in teaching an online course. Baylor, Ritchie (2002) discuss technology integration in teaching process operationalized from the teacher's perspective. Firstly, teaching process shouldinclude the extent to which the use of technology fits into the overall learning assignment and whether there are transitions before and after the activity. Secondly, the use of technology should be not a separate activity from otherassignment activities.

It is important for the technology-enhanced teaching that instructors fully understand the process of such teaching, the structure of the changed learning environment, are aware of how to build relationships with students, ways of supporting them in their self-regulated learning (Olapiriyakul, Scher, 2006). The changing role of teacher includes recognizing students' difficulties, guiding students in various assignments during the lessons, directing the groups' work, encouraging students to present their solutions in front of class, raising their level of thinking, and developing methods for the students to provide feedback to one another (Pundak, Herscovitz, Shacham, 2010, p. 7), contrary to traditional teaching when only the study content is presented, hoping for a passive student to sit, listen and memorize for the exams. Teachers have to become more tolerant, knowledgeable about various contexts, etc. in order toencourage all the studentsto learn independently relying on their differing qualities, identities, learning styles. In general, the role of support is perceived to make any course effective, i. e. to challenge students to learn, and make teachers and students satisfied with an experience of learning enhanced by technology.

As Beck (2008) has implied, similarly to authors mentioned earlier, a teacher has to find new ways to promote students learn the material as well as develop their competencies and higher thinking skills. Students must be taught to "reproduce existing knowledge, discuss and challenge existing knowledge and to apply subject discourses to simple and complex problem solving" (p. 480). To find these new ways pedagogical support for teachers is highly important.

*Organizational support.*Academic institutions can support their teachers with establishing and sharing the purpose of TEL integration as well as a clear definition of TEL (Graham, Woodfield, Harrison, 2012). The authors also found value in an administrative TEL advocate that would convince teachers of a need for TEL while involving teachers in decision making about how and what impact TEL would have on them. Educational institution policy must support integration of TEL, only then teachers will be able to develop their competences how to employ technologies in their lessons and will feel satisfied with the teaching process.

Olapiriyakul andScher (2006) state that educational institutions can and should provide teachers with rules and guidelines on how to prepare an effective online learning or blended learning course while giving them full responsibility for the course development.Similarly, to retain the best teachers and develop their competencies, the organization must strive for teachers' satisfaction as well. A study by Wasilik and Bolliger (2009) indicates that there are certain ways that administrators can employ to increase teachers' satisfaction in the virtual environment. One of those is to provide the faculty with a certain level of interactions with students online or face-to-face, as it is highly valued by teachers. Research showedthat teachers can even bare an increased workload if it adds to the amount and quality of interaction (Wasilik, Bolliger, 2009). However, it would be necessary for the administration to come up with ways that would enable teachers to have the same workload as their counterparts in traditional face-to-face learning to prevent feelings of discrimination.

Peer support. Dennis, Phinney and Chuateco (2005) point out that peer support for students is necessary for better learning outcomes and proves most helpful strategy for dealing with academic problems.Therefore, the student-centered approach is becoming inevitable: learners are customers, their expectations must be fulfilled and they have to be satisfied with a course in order to consider the studies valuable. That is why all information which is important for studies must be provided for learner and teacher guidance – and it must be available on time. Students' perception that they are not alone helps them to succeed in thecourse. Research carried out byJacklin and Riche (2009) on student support perceptions found learners to be generally happy about the support provided, which included

various dimensions of it, for example, friendly tutors, special help for disabled students and social networks, etc.

Information advice and guidance. Not only the satisfaction of students has to be ensured, but, as Motteram and Forrester (2005) emphasize, an understanding of students' needs is essential. Jacklin and Riche (2009) in a qualitative study have found that information, advice and guidance is one of the main support dimensions for the student.

Paechter, Maier, and Macher (2010) investigated students' expectations and experiences with an e-learning course. Their analysis showed two aspects that most strongly contributed to students' achievements in an online course and satisfaction with it: students' achievement goals and the role of instructor. Students who valued gaining particular competencies instead of just learning the course content achieved more. Students also valued the teacher who played the role of counsellor and facilitator.

An important part of a learning process is a learning community for students and teachers where they have an opportunity to interact with each other as well as with teachers. According to Cockbain, Blyth, Bovill, Morss (2008),the learning community increases their commitment and promotes their critical inquiry. Moreover, due to the changed learning environment, when a more independent learning is required, as Olapiriyakul and Scher (2006) summarize, students can be motivated by a more frequent direction as well as encouragement from lecturers. From the students' perception, as observed by Norton and Hathaway (2008), students need an effective instruction, illustrative examples, course facilitation, value, effective communication and suitable learning environment.

To summarize, while integrating TEL in an educational institution it is necessary to ensure pedagogical and organizational support for the teacher; peer advice and information guidance support for the learner; and technological support and resources for both the teacher and learner. If the support system is implemented the usage of technologies will lead to more efficient, acceptable, better processed and effective learning.

Support system of TELfor teachers in a VETorganization

Research methodology

*Sample.*This research was carried out in aVET organization that promotes integration of TEL and seeks to assess what support is needed for teachers, with special emphasis on organizational, pedagogical and technological support. Support to students and understanding of their needs are most crucial in order they were satisfied with TEL, however it was not an aim in this article.

At the time the research was made there were 300 teachers working in theVET organization. If the estimate of error is equal to 8% with 90%

confidence, the sample should be 79 respondents. The analyzed sample was of 80 questionnaires. 69 women (86.3 %) and 11 men (13.8%) participated in the research. The lowest age of the respondents was 21, the highest – 63 years (average 40.50, st. deviation 11.07). Average work experience in organization was 16 year (min. 1 year, max. 50 years; st. deviation 11.21). 66.3% of the respondents stated that they had more than 3 year experience of work with TEL.

Tool. Online data collection survey was used to define whetherthe strategy and management of the organization promoted integration of TEL; what teachers' opinion about the specific ICT tools installation and technological support was, as well as what knowledge and capabilities for using technologies they had. The questionnaire for teachers consisted of the following parts: general questions; organizational support in terms of strategy and management; technological support in terms of resources and support accessibility; pedagogical support, including justification of competencies necessary for using ICT for teaching and curriculum development.

Inner consistency of the questionnaire was high (Crombach α =0,907). For data analysis the MS Excel and SPSS (Statistical Package of Social Sciences) version 16.01 were applied. Data analysis method was descriptive and interferential (chi-square test, ANOVA, significance level α=0.05).

Research results

Research results present teachers' approach to organizational, technological and pedagogical support for the integration of TEL. Organizational support includes organizational strategy for ICT approach, policies aligned to support ICT and faculty incentives for technology use in learning.

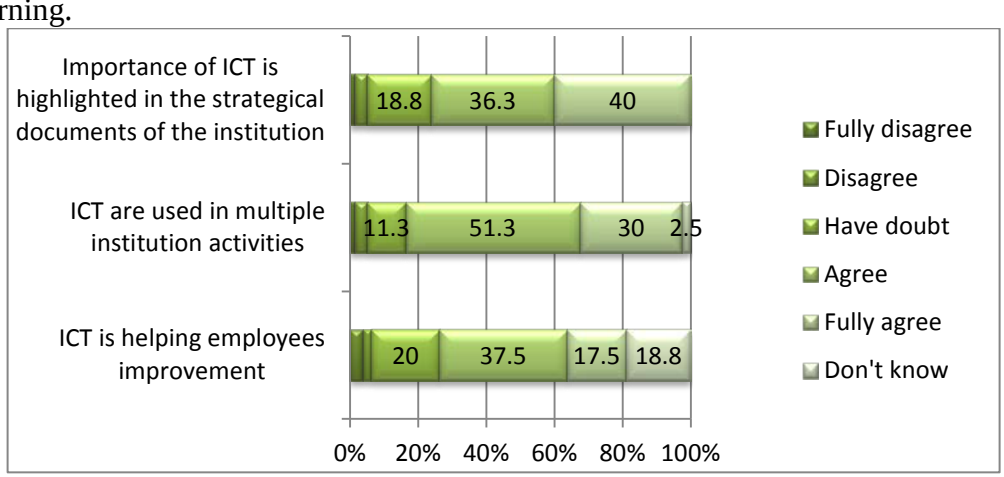

Figure 2. ICT in strategic documents in the VET organization

76.3%of the respondents think that ICT is helpful for employees' improvement. Even more respondents agree that ICT is widely used. However, even 18.8% cannot say, and 20% have doubt that importance of ICT is highlighted in strategic documents of the institution (Fig.2). It can be said that strategic documents of the organization must show the importance of ICT: this aspect is emphasized by teachers. In this organization employees are not sufficiently informed about the strategic development directions of the organization; the employees are not aware of strategic documents of the organization.

Technological support is one of the most important elements of support system, as teachers must be able to combine the latest technology and educational content for more efficient, more effective, more acceptable learning results.

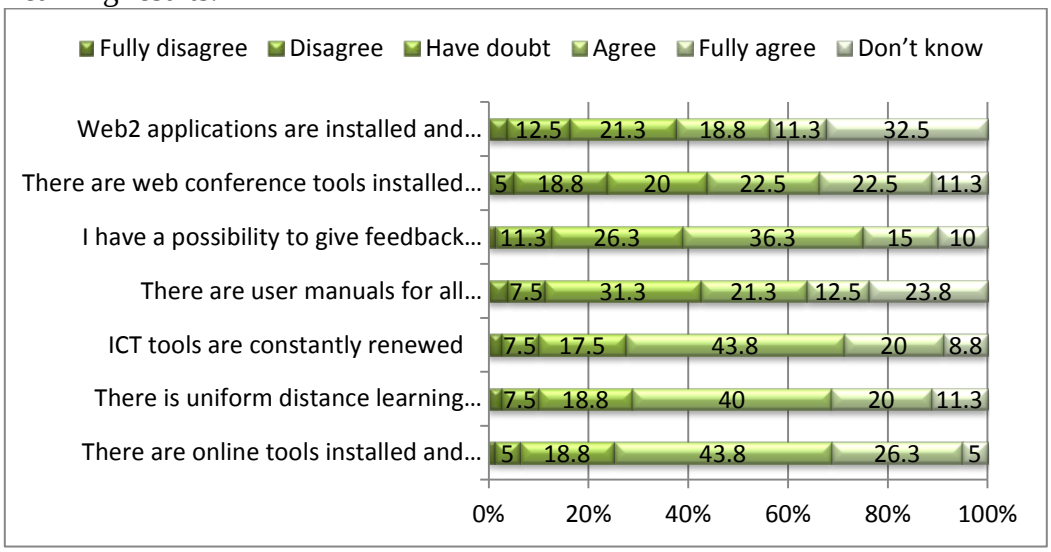

Figure 3.Usage of technological tools in VET organization

The research results show that respondents cannot clearly respond to the presented questions on technological tools (Fig.3): more than 20% of the answers were "have doubt" or "don't know". Most doubtswere raised by the claim of the existence of a user manual for installed technology solutions.It can be assumed that technological support is not provided enough in this VET organization. 40% of the respondents say that there are web conference tools installed and used in organization, but more than 20% do not know that. It can be assumed that not all teachers are aware of existing opportunities in the VET organization. Not knowing these opportunities, teachers do not use them at work. Responding to the statement "Web2 applications are installed and offered to use" 32% of respondents answered "don't know", 21.3% "have doubt" and 11.3% "disagree". These answers suggest that teachers do not understand the term WEB2. This shows their

lack of knowledge about technological tools and their application. These responses indicate that the organization is not providing knowledge of technological solutions for the teachers; and there is lack of sufficient technological support.

Following the fact that 66.1%of the respondents had more than 3 year experience in using TEL, chi square was used to compare whether there is any difference of evaluation of technological support. Results showed that there is no statistically significant difference in this sample ($p>0.05$).

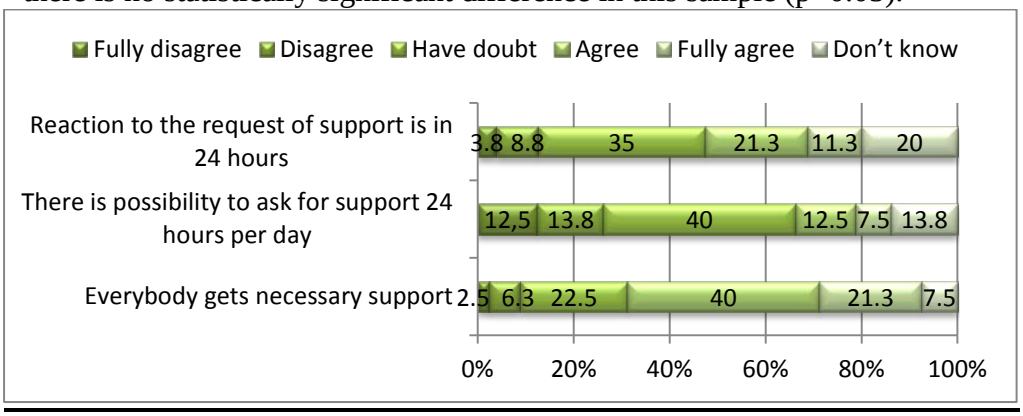

Figure 4. Technical support for the teachers

Concerning technological support for teachers (Fig.4) research results show that 61.3% of the respondents gets needed support, but 32. 6% claim that the reaction to the request for support is in 24 hours. 38.8% of the respondents have doubts whether they get support in 24 hours and 26.3% says that they do not get the needed support in 24 hours. This shows that in this vocational training organization technical support must be improved and developed. All teachers should get the needed technical support.

Pedagogical support is one more type of support which is significant for the teachers.The majority of teachers use ICT on the daily basis (Fig.5, Fig.6)

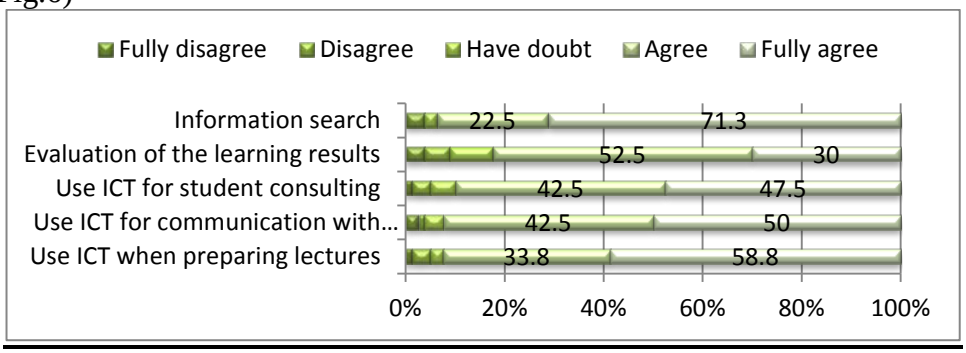

Figure 5.ICT usage

80% of the respondents state that they use ICT in their work assignments. Mostly, technologies help in finding information, preparing for the lectures, communicating and consulting students. Least of all technologies are used for evaluation of learning results.

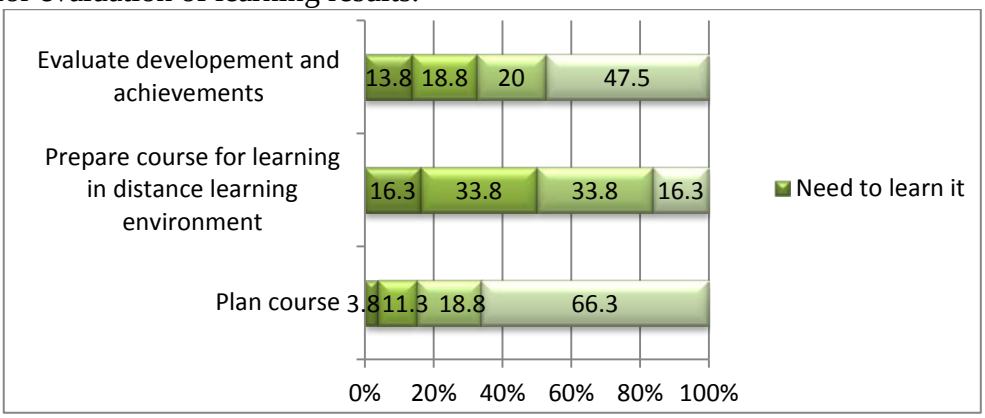

Figure 6. Teacher skill self-assessment while working with TEL

Respondents state that when using TEL they are best at assessing the progress and achievements, using discussion forums and chat, and the least skilled at administering users to log in and read, moderating and responding to the questions during a video conference.Looking at these results it is clear that there is a need of a technician, who could give support for teachers to improve their skills to use various tools for TEL.

Chi square was used to look for differences between teachers with varying levels of experience of work with TEL. It was found that there are no significant differences of self-assessment of skills while working with TEL in this sample ($p>0.05$). Notwithstanding respondents having more than three year work experience claim that they can plan a course by themselves (73.6%), and assess progress (47.2%), but there were no differences comparing with respondents who have less experience with TEL. 60% of less experienced respondents claim that they can plan a course by themselves and assess progress (36.8%), to prepare full course – 21.1%.

In order to assess which type of support shows the highest readiness of the application of TEL, and which still needs to be improved, all kinds of support were calculated into indexes (index expressed as average).Comparing the indexes of blocked data by ANOVA showed that the differences were statistically significant ($F = 49.284$, $df = 2.410$, $p = 0.000$), (Fig.7).

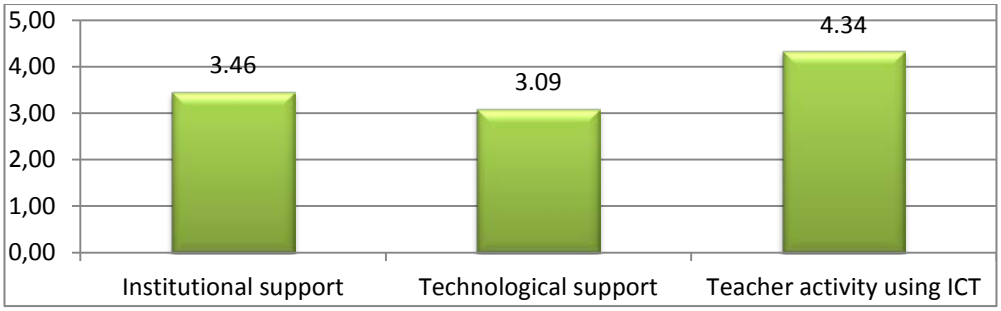

Figure 7. Comparison of different kinds of support systems in aVETorganization

In conclusion, the research results demonstrate that teachers consider the least received support to be technological support. The best evaluated was teacher work and development of ICT. This leads to the generalization that there is strong pedagogical support in this vocational training institution, but it can be suggested that teachers still need more support while using web conference tools, cloud computing, social networks, mobile tools, etc., as these tools are rarely used in teaching process. However,the fact is theteacher does not know whetherthe importance of TEL is discussed in the strategic documents of theVET organization.

Discussion

Graham, Woodfield and Harrison (2012) andOlapiriyakul, Scher (2006) state that organizational support can help teachers to integrate TEL into the teaching process. Research results agree with these researchers and show that TEL integration can be significantly hindered by the fact that teachers do not know whetherstrategic documents of the educational organization cover the intended ways of integration of ICT usage and TEL.

Technological support obligates teachers to find ways how to combine the latest technology with traditional didactic elements (Jahnke et al., 2012). Olapiriyakul and Scher (2006) point out that technological support is required for an effective TEL course.The results of this researchdemonstrate that teachers do not precisely know what kind of technological tools are installed and used in the vocational training organization and from who and in what time they can receive support while using these tools. This research supplements Olapiriyakul and Scher (2006) and Specht, Klemke (2013) researches stating that technological support must be developed, elaborated and available for every teacher.

These results are consistent with Baylor, Ritchie (2002) research.This research shows thatteachers working in the analyzed vocational training organization attain great value to their own ICT competences used in traditional teaching, for example the usage of Power Point program, video programs, search for information in the Internet. However, research results

raise the question whether the teacher is capable to use new technologies in the teaching process (to use mobile phones, notebooks, tablets, different OS, etc.).

The results of the current VETorganizationresearch show that the integration of TEL in this institution is still at its initial level. It is necessary to improve the support system for teachers in the organization.

Conclusion

Research literature analysis has led to the conclusion that while integrating TEL in an educational institution it is necessary to ensure pedagogical and organizational support for the teacher; peer and information advice and guidance support for the learner; and technological support and resources for both teacher and learner. If the support system is implemented, the use of technologies will lead to a more efficient, acceptable, better processed and effective learning.

Research results in a VETorganization haverevealed that teachers do not get sufficient technological support. What is more, teachers do not know whether the importance of TEL is discussed in strategic documents in this VETorganization. This leads to the conclusion that organizational support is not sufficient in this VETorganization. Best evaluated was pedagogical support, but teachers still need support while using web conference tools, social networks, mobile tools, as these tools are rarely used in teaching process.

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